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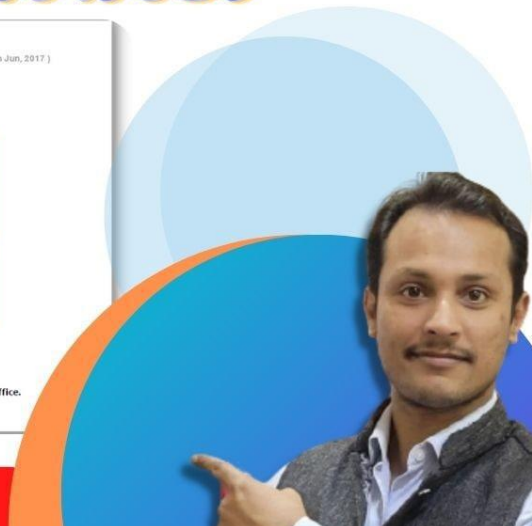
**UNION PUBLIC SERVICE COMMISSION  
MARKSHEET**

Civil Services (PRELIMINARY) Examination , 2016	
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**REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION, 2016**

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**SANTOSH SIR**  
**CRACKED ALL 6 PRELIMS**



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# What do our CSE 2022 TOPPER say?

Thank you sir.

The [DPN notes](#) were very comprehensive and useful. I used it to supplement my newspaper knowledge. It really helped in dealing with the current affairs portion of the prelims exam, since you compile it from so many sources.

Would recommend students to maintain their own digital notes using that source.

After I didn't clear first prelims, I joined your [mains master notes](#) which helped me identify key areas for note making.

Thank you sir for your relentless effort in updating these notes.

They're helpful for the aspirants.



**Ishita Kishore**  
AIR 1, CSE2022

Ishita has been a student of  
ONE YEAR LAQSHYA PRELIMS MENTORSHIP  
MAINS MASTER MENTORSHIP

## Economy

### 1. RBI guidelines to help mobilise domestic capital towards green activities

#### **Subject :Economy**

#### **Section Monetary policy**

**Context:** Reserve Bank of India (RBI) has issued a framework for green deposits, which are investments meant to be used towards environmentally sustainable projects.

#### **More on the News:**

- The purpose and rationale for the framework, RBI said is to **encourage REs to “offer green deposits to customers, protect interest of the depositors, aid customers to achieve their sustainability agenda, address greenwashing concerns** and help augment the flow of credit to green activities/projects”.

#### **Key Features of the Framework for acceptance of green deposits**

- **Applicability:** The framework is **applicable to Scheduled Commercial Banks**, including Small Finance Banks, **excluding Regional Rural Banks, Local Area Banks and Payments Banks and all deposit-taking Non-Banking Financial Companies (NBFCs)**, including Housing Finance Companies.
- **Allocation:** REs will be required to **allocate the proceeds raised through green deposits towards a list of green activities and projects** that encourage energy efficiency in resource utilization, reduce carbon emissions and greenhouse gases, promote climate resilience and/or adaptation, and improve natural ecosystems and biodiversity.
- **Exclusion:** Projects involving new or existing extraction, production and distribution of **fossil fuels, including improvements and upgrades, nuclear power, direct waste incineration, alcohol, weapons, tobacco, gaming, or palm oil industries**, renewable energy projects generating energy from biomass using feedstock originating from protected areas, landfill projects and hydropower plants larger than 25 MW have been excluded from green financing.
- **Financing Framework:**
  - To **ensure effective allocation of green deposits**, REs must **put in place a Board-approved Financing Framework (FF)**. The green deposits shall be **denominated in Indian Rupees only**.
  - The allocation of funds raised through green deposits by REs during a financial year shall be **subject to independent third-party verification/assurance**, which shall be **done on an annual basis**.

#### **GreenBonds:**

- Green bonds are issued by companies, countries and multilateral organisations to exclusively fund projects that have positive environmental or climate benefits and provide investors with fixed income payments.
- The projects can include renewable energy, clean transportation and green buildings, among others.
- **Example of Green Bonds:**
  - The World Bank is a major issuer of green bonds and issued \$14.4 billion of green bonds between 2008 and 2020.
  - These funds have been used to support 111 projects around the world, largely in renewable energy and efficiency (33%), clean transportation (27%), and agriculture and land use (15%).
  - By the end of 2020, 24 national governments had issued Sovereign Green, Social and Sustainability bonds totalling a cumulative \$111 billion.

#### **India's Sovereign Green Bonds Framework:**

- First announced in the Union Budget 2022-23, the proceeds of these green bonds will be issued for mobilising resources for green infrastructure.
- Under the framework, the Finance Ministry will, every year, inform the RBI about spending on green projects for which the funds raised through these bonds will be used.

- The government has decided to issue Sovereign Green Bonds (SGrBs) on January 25 , which is of 5 and 10 years tenor and ₹4,000 crore each.
- This will be followed up by another tranche of SGrB issuance of 5 and 10 years tenor for ₹4,000 crore each on February 9.
- Overall, Government will mobilise Rs 16,000 crore through the issuance of green bonds in the current fiscal ending March 2023.

#### Features of the SGrBs:

- **Issuance Method**
  - SGrBs will be issued through **Uniform Price Auction** (a public sale in which a fixed number of similar things are sold at the same price).
- **Eligibility for Repurchase Transactions (Repo)**
  - SGrBs will be **eligible for Repurchase Transactions (Repo)**.
  - SGrBs will also be reckoned as eligible investment for Statutory Liquidity Ratio (SLR) purpose.
- **Tradability**
  - SGrBs will be eligible for trading in the secondary market.
- **Investment by Non-residents**
  - SGrBs will be designated as specified securities under the ‘Fully Accessible Route’ for investment in Government Securities by non-residents.
- **Eligible Projects:**
  - All eligible green expenditures will include public expenditure undertaken by the government in the form of investment, subsidies, grants-in-aid, or tax foregone (or a combination of all or some of these) or select operational expenditures.
  - R&D expenditures in public sector projects that help in reducing the carbon intensity of the economy and enable country to meet its Sustainable Development Goals (SDGs) are also included in the framework.
  - The eligible expenditures will be limited to government expenditures that occurred maximum 12 months prior to issuance of the green bonds.
- **Sectors not included**
  - Nuclear power generation, landfill projects, alcohol/weapons/tobacco/gaming/palm oil industries and hydropower plants larger than 25 MW have been excluded from the framework.
- **Where will the proceeds go?**
  - The framework sets forth the obligations of the Government of India as a green bond issuer.
  - The proceeds from the green bonds issuance **will be deposited in the Consolidated Fund of India (CFI)** in line with the **regular treasury policy**, and then funds from the CFI will be made available for the eligible green projects.
- **Implementing Agency:**
  - The Ministry of Finance has constituted a **Green Finance Working Committee (GFWC)** including members from relevant ministries and chaired by the Chief Economic Advisor.
  - The GFWC will **meet at least twice a year to support the Ministry of Finance** with selection and evaluation of projects and other work related to the Framework.

## 2. Don't increase unsecured loans exposure: RBI to banks

### **Subject :Economy**

#### **Section: Monetary Policy**

#### **Why in News?**

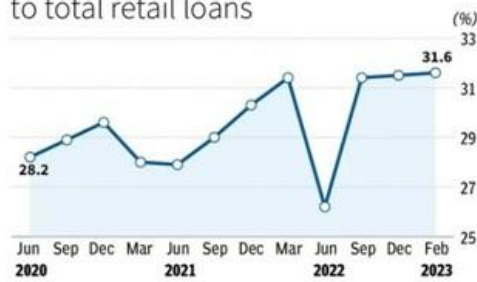
As part of increasing caution amidst growing macro-economic uncertainties and bank collapses in the US and Europe, India's central bank is asking banks to be watchful over their retail portfolios, particularly the unsecured loans. These include personal loans, credit cards, small business loans and micro finance loans.

The overall share of unsecured loans as an average across private banks has increased by over 300 basis points since June.

#### **Latest Credit Deployment Data**

- It is published by RBI.
- Unsecured loans lent between February 2022 to February 2023 stood at ₹2.2-lakh crore, higher than the deployment towards large corporates at ₹1.18-lakh crore.
- The size of the home loan market during this period was ₹2.49-lakh crore just marginally larger than the unsecured loans market.

Share of unsecured loans to total retail loans



#### **What are Unsecured Loans?**

- In unsecured loans, the borrowers' assets are not pledged as collateral.
- Examples of such loans are personal loans, education loans, credit cards etc.
- They are given out on the basis of credit worthiness of the borrowers.
- The interest rates on unsecured loans is higher than the secured loans. This is mainly because the options for recourse for lender in case of unsecured loans are limited.

#### **Previous Measures**

- In 2019, the risk weight on unsecured loans excluding credit cards was reduced from 125 per cent to 100 per cent to place them at par with other retail loans. It was also done to harmonise the risk weights to Basel-III requirements.
- Despite repeated warning to banks, especially private banks, unsecured loans growing faster than the secured retail loans may lead to increase in risk weights by RBI.

#### **Basel III Requirements**

Basel III is an **internationally agreed set of measures** developed by the BCBS in response to the financial crisis of 2007-09. The measures aim to strengthen the regulation, supervision and risk management of banks.

#### **Basel 3 measures are based on three pillars:**

**Pillar 1:** Improve the banking sector's ability to absorb ups and downs arising from financial and economic instability

**Pillar 2:** Improve risk management ability and governance of banking sector

**Pillar 3:** Strengthen banks' transparency and disclosures

#### **Basel Committee on Bank Supervision (BCBS)**

1. It is a **committee under the Bank for International Settlements**.
2. Established in **1930**, the **BIS** is owned by 60 central banks, representing countries from around the world that together account for about 95% of world GDP.
3. Its head office is in **Basel, Switzerland**.



4. Its mission is to **serve central banks in their pursuit of monetary and financial stability**, to foster international cooperation in those areas and to act as a bank for central banks.

#### **No Proper Checks**

- Adequate credit checks may not be in place due to securitization of personal loans and 30-minutes sanctioning.
- Difficult to assess the exact asset quality of such loans
- So, to avert a systemic risk, the pace of growth in the unsecured loans should be reduced. Even on the Microfinance side banks should not overdo growth despite the improvement in demand and collection efficiencies of MFI loans.

#### **Sachetisation of Loans**

1. This means loans can be broken down into levels that actually suit the needs of the borrowers, while keep lenders interested
2. If *the loan's tenure and terms are designed flexibly to align with borrowers' cash flow cycle*, the whole exercise is bound to be sustainable

#### **MFIs**

Microfinance institutions (**MFIs**) are financial companies that provide small loans to people who do not have any access to banking facilities.

#### **Small Finance Banks**

- Small Finance Banks are the financial institutions which provide financial services to the unserved and unbanked region of the country. They are registered as a public limited company under the Companies Act, 2013.

#### **NBFCs**

- NBFCs are financial institutions that provide various financial services and products, including loans, insurance, and asset management, but **do not have a banking license**. Unlike banks, NBFCs do not have the authority to accept **deposits from the public**.

### **3. De-dollarisation: the race to attain the status of global reserve currency**

#### **Subject : Economy**

#### **Section: External Sector**

#### **Concept :**

#### **De-dollarisation**

- De-dollarisation **refers to the replacement of the U.S. dollar by other currencies as the global reserve currency**.
- A **reserve currency** refers to any currency that is widely used in cross-border transactions and is **commonly held as reserves by central banks**.
- China and Russia are among the nations that have supported de-dollarisation.
- Iran and Russia will jointly issue a new cryptocurrency backed by gold, to serve as a payment method in foreign trade.

#### **Need for de-dollarisation:**

- The U.S. imposed several sanctions that restricted the use of the U.S. dollar to purchase oil and other goods from Russia.
- This has been seen by many countries as an attempt to weaponise the dollar.
- Since international transactions carried out in the U.S. dollar are cleared by American banks, this gives the U.S. government significant power to oversee and control these transactions.
- Currently, the Chinese yuan is seen as the primary alternative to the U.S. dollar owing to China's rising economic power.

#### **Advantage of a reserve currency advantage**

- A reserve currency is the foreign currency held by central banks (in India's case, RBI) to:
- facilitate international transactions,
- stabilise exchange rates and

- bolster financial confidence
- Other currencies such as the British pound and the French franc have served as international reserve currencies in the past.
- It is the **currencies of economic superpowers that have usually ended up being used as the global reserve currency.**
- Critics of the U.S. dollar believe that the global reserve currency status gives the dollar unfair privileges over other countries, thus justifying de-dollarisation attempts by many countries.
- It should be noted that when a country's fiat currency enjoys reserve currency status, it gives the country the power to purchase goods and other assets from the rest of the world by simply creating fresh currency out of thin air.
- However, such irresponsible expansion of the money supply can cause the debasement of the currency and eventually threaten its status as a reserve currency.

#### Why dollar is so popular?

- The U.S. dollar is **widely used in international transactions because people actually prefer to use the American currency over others for various economic reasons.**
- A recent attempt by India and Russia to carry out trade between the two countries in Indian rupees rather than in U.S. dollars has hit a roadblock because the value of India's imports from Russia far outweighs its exports.
- This left Russia with excess rupees in hand which it was unwilling to spend on Indian goods or assets, and led to Russian demands for the settlement of bilateral trade in U.S. dollars.
- The high level of trust that global investors have in the U.S. financial markets, perhaps owing to the 'rule of law' in the U.S., is considered to be a major reason why investors prefer to invest in U.S. assets.

#### 4. Quality control Order not protective

**Subject :Economy**

**Section: msc**

#### **Quality Council of India (QCI)**

- The Quality Council of India (QCI) works for promotion of Quality Standards across various economic and social sectors such as manufacturing, education, health and environment.
- The QCI has been established as a National body for Accreditation on recommendation of Expert Mission of EU after consultation in Inter-Ministerial Task Force, Committee of Secretaries and Group of Ministers through a Cabinet decision in 1996.
- Accordingly, the QCI was set up through a PPP model as an independent autonomous organization with the support of Government of India and the Indian Industry represented by the three premier industry associations, (i) Associated Chambers of Commerce and Industry of India (**ASSOCHAM**), (ii) **Confederation of Indian Industry (CII)** and (iii) **Federation of Indian Chambers of Commerce and Industry (FICCI).**

The QCI is the umbrella organisation of five boards:

1. **NABL – National Accreditation Board for Testing and Calibration Laboratories;**
2. **NABH- National Accreditation Board for Hospitals & Healthcare;**
3. **NABET- National Accreditation Board for Education and Training;**
4. **NABCB- National Accreditation Board for Certification Bodies; and**
5. **NBQP- National Board for Quality Promotion.**

Besides carrying out accreditation, certification, empanelment and third-party assessment activities through its Boards, QCI is also involved in project initiation, planning & development and its successful execution for various ministries, Government departments and State Governments. It carries out such activities through its five Boards and three divisions under Special Projects namely:

1. [ZED] – ZERO DEFECT ZERO EFFECT,
2. [PADD] – Project Analysis and Documentation Division; and
3. [PPID] – Project Planning & Implementation Division.

The projects are carried out as and when allotted by the concerned departments/organizations and as per the scope, guidelines and timelines as agreed with the concerned organizations/ departments.

QCI operates its quality assurance activities in areas related to industry, education & training, laboratory, environment, health care, sports, etc. through its above five constituent Boards.

## 5. MSCI tweak: What triggered the sell-off in HDFC twins?

**Subject: Economy**

**Section: Monetary Policy**

**Context:**

Market participants said MSCI intends to delete HDFC from MSCI Global Standard Index and at the same time add HDFC Bank to the large cap segment of MSCI Global Standard Indexes

This means that the weight of the merged entity will be lower than what HDFC Ltd currently has in the MSCI India Index.

Currently HDFC Ltd weight is 6.74 per cent in MSCI India Index and as per our preliminary calculations the merged entity would have slightly lower weight of about 6.5 per cent.

**Background:**

HDFC Bank will merge parent HDFC in its ambit to enable seamless delivery of home loans and leverage on the large base of customers of HDFC Bank.

The merger is to create a large balance sheet and net worth that would allow a greater flow of credit into the economy. It will also enable the underwriting of larger ticket loans, including infrastructure loans, an urgent need of the country.

**What is MSCI India Index?**

Morgan Stanley Capital International (MSCI) has set up many global indices, one of which is a composite of Indian stocks-the MSCI India index.

Many reputed Indian companies across sectors are included in the index. These companies amount to at least 85% of the total equity offered by Indian companies.

**How is the MSCI India Index formed?**

The MSCI India is a **weighted index just like the Sensex**. This means every stock on the index has a particular weightage, which depends on a number of parameters.

The three most important are: the returns (dividend) that investors receive on the shares; the company's total turnover, and its market capitalization.

**Why FIIs use MSCI India index?**

- Foreign investors want international markets to invest their funds. They want to know more about the stability and volatility in the prices of shares.
- **The MSCI India Index acts as an indicator of the soundness of the Indian capital market.**
- The weightage of a company depends on its performance in different categories such as the total turnover, market capitalization and dividend return.
- Greater the weightage, higher will be the amount of foreign investment into the stocks. In simple words, **the amount of funds that a foreigner will invest in an Indian share will be directly dependent on the stock's weightage on the MSCI index**. If the weightage of a company is reduced then there is always a possibility of foreign investors withdrawing their funds.

## 6. Chartered accountants, company secretaries now under ambit of money laundering law

**Subject: Economy**

**Section: Fiscal Policy**

**Context:**

Notifying changes to the Prevention of Money Laundering Act, the Finance Ministry has brought in practicing chartered accountants, company secretaries, and cost and works accountants carrying out financial transactions on behalf of their clients into the ambit of the money laundering law.

**Lawyers and legal professionals, however, seem to have been kept out in the new definition of entities covered under the PMLA.**

**Prevention of Money Laundering Act**

- The PMLA was enacted in 2002 and it came into force in 2005. The chief objective of this legislation is to fight money laundering, that is, the process of converting black money into white.



- The Act enables government authorities to confiscate property and/or assets earned from illegal sources and through money laundering.
- Under the PMLA, the burden of proof lies with the accused, who has to prove that the suspect property/assets have not been obtained through proceeds of crime.
- The provisions of this act are applicable to all financial institutions, banks(Including RBI), mutual funds, insurance companies, and their financial intermediaries.

### **PMLA Amendment 2019**

- The amendment seeks to treat money laundering as a stand-alone crime.
- Till now Money Laundering was not an independent crime; rather depended on another crime, known as the 'predicate offence' or 'scheduled offence', the proceeds of which are made the subject matter of crime of money laundering.
- It also expands the ambit of "proceeds of crime" to those properties which "may directly or indirectly be derived or obtained as a result of any criminal activity relatable to the scheduled offence.
- The most crucial amendments are the deletion of provisions in sub-sections (1) of Section 17 (Search and Seizure) and Section 18 (Search of Persons).
- These provisions required the pre-requisite of an FIR or charge sheet by other agencies that are authorised to probe the offences listed in the PMLA schedule.
- An explanation is added to Section 45 that clarifies that all PMLA offences will be cognisable and non-bailable.
- Therefore, ED will be empowered to arrest an accused without a warrant, subject to certain conditions.
- Another vital amendment makes concealment of proceeds of crime, possession, acquisition, use, projecting as untainted money, or claiming as untainted property as independent and complete offences under the Act.
- Section 72 will now give power to the Centre to set up an Inter-Ministerial Coordination Committee for inter-departmental and inter-agency coordination for operational and policy level cooperation, for consultation on anti-money laundering and counter-terror funding initiatives.

### **Recent Changes in notification:**

An activity will be recognised under the PMLA if these professionals carry out financial transactions on behalf of their client such as

- buying and selling of any immovable property;
- managing of client money, securities or other assets;
- management of bank, savings or securities accounts;
- organisation of contributions for the creation, operation or management of companies;
- creation, operation or management of companies, limited liability partnerships or trusts, and buying and selling of business entities

Earlier the government had **widened the ambit of reporting entities under money laundering provisions to incorporate more disclosures for non-governmental organisations and defined politically exposed persons (PEPs) under the PMLA in line with the recommendations of the FATF**

The new changes have been made in the sub-clause (vi) of clause (sa) of sub-section (1) of section 2 of the PMLA, which defines different categories of persons covered under the law.

The financial **professionals who have obtained certificates of practice as chartered accountants**, company secretaries, cost and work accountants would be defined as relevant persons for reporting transactions on behalf of their individual clients.

The amendments are expected to aid investigative agencies further in their probe against dubious transactions involving shell companies and money laundering,

As per **the FATF recommendations relating to designated non-financial businesses and professions to be followed by member countries**, professionals such as lawyers, notaries, other independent legal professionals and accountants should be required to report suspicious transactions when, on behalf of or for a client, they engage in a financial transaction linked to buying and selling of real estate;

Managing of client money, securities or other assets; management of bank, savings or securities accounts; organization of contributions for the creation, operation or management of companies; creation, operation or management of legal persons or arrangements, and buying and selling of business entities

Countries are strongly encouraged to extend the reporting requirement to the rest of the professional activities of accountants, including auditing," the FATF recommendations stated

## Financial Action Task Force

- The Financial Action Task Force (FATF) is an **inter-governmental** body established in 1989 during the G7 Summit in Paris.
- The objectives of the FATF are to set standards and promote effective implementation of legal, regulatory and operational measures for combating money laundering, terrorist financing and other related threats to the integrity of the international financial system.
- Its Secretariat is located at the Organisation for Economic Cooperation and Development (OECD) **headquarters in Paris.**
- Member Countries: it consists of thirty-seven member jurisdictions. India is one of the members.

## 7. RBI wants banks to sign new locker agreement with clients

**Subject: Economy**

**Section: Monetary Policy**

**Context:** Users of lockers will have to sign a fresh agreement with their respective banks, The Reserve Bank of India asking for revisions in the existing document.

**Details:**

**What is the new regulation regarding lockers?**

- The revised safe deposit locker agreements now clearly specify that lockers can be used only for **legitimate purposes such as storing jewellery and documents and not for storing any cash or currency, arms, weapons, drugs, contraband, or hazardous substances.**
- The license granted to use the locker is **only for the customer's own use and is non-transferable.**
- The agreements, which are based on the **Indian Banks' Association's model agreement**, state that the customer will be responsible for the misuse of the key to the locker provided by the bank or the password generated for having access to the locker. The bank will not be responsible for any unauthorised use of a key or password. The customer will have a right to use the locker for keeping belongings and expect reasonable care by the bank for protecting such belongings, and in case of the bank's failure to do so, avail of such remedies as may be available from time to time under the applicable law and regulations.
- Banks will bear the cost of stamp papers while executing supplementary agreements with existing locker-hirers only. For others, the cost of stamp paper will be borne by the customers.
- The bank will have the right to recover the rent and any other cost incurred by the bank in relation to the locker to the debit of the customer's account in the event the same is not paid by the customer in advance or when due, per the model agreement
- Further, a bank can refuse access to the locker if the rent due on the locker remains unpaid and a customer fails to provide proof of identity when demanded by the bank at the time of seeking access to the locker.

## 8. RBI gold reserves rise to 794.64 tonnes

**Subject : Economy**

**Section: External Sector**

**Concept :**

- RBI has increased its gold reserves by 34.22 tonnes YoY to reach 794.64 tonnes at the end of March 2023, according to the central bank's data.
- Gold is considered a **safe-haven asset and has been historically used to back a country's currency.**

**Significance of Gold Reserves**

- **Economic stability:** Gold reserves are often seen as a **symbol of economic stability and confidence, especially during times of financial crisis or uncertainty.** Holding gold reserves can help central banks to maintain the stability of their currency and the economy.
- **Diversification:** Gold is considered a **safe-haven asset and can provide diversification to a country's foreign exchange reserves portfolio.** Diversification helps to reduce the risks associated with any single asset class.
- **Hedge against inflation:** Gold is considered an **inflation hedge as its value tends to increase during times of high inflation or when the value of a currency is depreciating.** Holding gold reserves can help to protect the purchasing power of a country's currency.

- **International transactions:** Gold reserves can be used as collateral for loans and international transactions. Countries can also use gold reserves to settle international debts.
- **Confidence-building:** The level of a country's gold reserves can be an indicator of the country's financial strength and stability. High levels of gold reserves can help to build confidence among investors and other countries.

#### Breakdown of RBI's gold reserves

- **Total:** As of March-end 2023, the **RBI held 794.64 metric tonnes of gold**, including gold deposits of 56.32 metric tonnes.
- **Domestic and abroad:** Out of the total gold reserves, **22 metric tonnes of gold is held overseas in safe custody** with the Bank of England and the Bank of International Settlements (BIS), **while 301.10 metric tonnes of gold is held domestically**.

#### How much do these gold reserves value?

- In value terms (USD), the share of gold in the total foreign exchange reserves increased from about 7.06% as of September-end 2022 to about 7.81% as of March-end 2023, as per the RBI's report.
- During the half-year period, the reserves increased from \$532.66 billion as of September-end 2022 to \$578.45 billion as of March-end 2023.

#### Foreign Exchange (Forex) Reserve

- Foreign exchange reserves are **important assets held by the central bank in foreign currencies as reserves**.
- They are **commonly used to support the exchange rate and set monetary policy**.
- In India's case, foreign reserves include Gold, Dollars, and the IMF's quota for Special Drawing Rights.
- Most of the reserves are usually held in US dollars, given the currency's importance in the international financial and trading system.
- Some central banks keep reserves in Euros, British pounds, Japanese yen, or Chinese yuan, in addition to their US dollar reserves.
- **India's forex reserves cover:**
  - Foreign Currency Assets (FCAs)
  - Special Drawing Rights (SDRs)
  - Gold Reserves
  - Reserve position with the International Monetary Fund (IMF)

### 9. GST e-invoicing to include smaller firms from August 2

#### Subject : Economy

#### Section: Fiscal policy

#### Concept :

- Centre has made it mandatory for all businesses **with an annual turnover of ₹5 crore** to use e-invoices from August 1.
- The Central Board of Indirect Taxes and Customs (CBIC), which notified the reduction **from the current ₹10-crore level** stipulated for e-invoicing late Wednesday, also rolled out an '**Automated Return Scrutiny Module**' for GST returns.
- The module's implementation has already commenced with the scrutiny of GST returns for the financial year 2019-20.

#### e-Invoicing

- e-Invoicing under GST denotes electronic invoicing defined by the GST law. Just like how a GST-registered business uses an e-way bill while transporting goods from one place to another.
- Similarly, **certain notified GST-registered businesses must generate e invoice for Business-to-Business (B2B) transactions**.

#### About Automated Return Scrutiny Module

- The module is a part of a **non-intrusive compliance verification process** designed for Central Tax Officers to scrutinize GST returns of Centre Administered Taxpayers.
- **Taxpayers are selected based on data analytics and risks identified by the system**. The module displays discrepancies and risks associated with a return to tax officers in their dashboard, streamlining the communication and action process.

- The Automated Return Scrutiny Module, integrated into the ACES-GST backend application, leverages data analytics to identify risks and discrepancies in GST returns.
- The module **automatically generates alerts in cases of non-compliance**.
- Automated Return Scrutiny Module for GST returns is a significant step towards improving tax compliance and simplifying the tax administration process.

## 10. Ensure complete transition away from Libor: RBI tells banks/FIs

**Subject: Economy**

**Section: Monetary Policy**

**Context:**

- The Reserve Bank of India has asked banks financial institutions to ensure that new transactions undertaken by them or their customers do not rely on or are priced using the **US\$ LIBOR (London Interbank Offered Rate)** or the **Mumbai Interbank Forward Outright Rate (MIFOR)**.
- The aforementioned key message to banks and other RBI-regulated entities is part of an advisory emphasising the need to take steps to ensure a complete transition away from LIBOR from July 1.
- The central bank said the Financial Benchmarks India Pvt Ltd (FBIL) will cease to publish MIFOR after June 30.
- Banks/FIs have been advised to take all necessary steps to ensure insertion of fallbacks at the earliest in all remaining legacy financial contracts that reference US\$ LIBOR (including transactions that reference MIFOR).
- RBI said banks/FIs are expected to have developed the systems and processes to manage the complete transition away from LIBOR.

**Past**

The Reserve Bank will continue to monitor the efforts of banks/FIs for ensuring a smooth transition from LIBOR. The central bank had issued an advisory on 'Roadmap for LIBOR Transition' in July 2021, where banks/FIs, inter-alia, were encouraged to undertake transactions using widely accepted Alternative Reference Rate (ARR), as soon as practicable and in any case by December 31, 2021, and insert robust fallback clauses in relevant LIBOR-linked financial contracts.

The complete transition from LIBOR is a significant event in the global financial markets, which requires continued attention from all stakeholders to mitigate operational risks and ensure an orderly transition, said the RBI.

**Concerns about LIBOR**

- The use of LIBOR was called into question following the global financial crisis. Regulatory reviews identified that shifts in the way banks fund their operations meant LIBOR was increasingly calculated based on panel bank judgments as to their borrowing costs, rather than actual transaction data, according to India Exim Bank's FAQs on LIBOR transition.
- Global regulators desired that interest rate benchmarks be founded upon actual transactions, not expert judgment, in order to be robust and reliable.
- In 2017, the UK Financial Conduct Authority/ FCA announced that the underlying markets, upon which LIBOR is derived were insufficiently active to offer a sustainable interest rate benchmark. It announced it had secured undertakings from panel banks to make LIBOR submission until the end of 2021 but would not expect to compel them to make submissions beyond that date.
- The FCA had announced in March 2021 that all LIBOR settings will either cease to be provided by any administrator or no longer be representative: immediately after December 31, 2021, in the case of all Pound sterling, Euro, Swiss franc and Japanese yen settings, and the 1-week and 2-month US dollar settings; and immediately after June 30, 2023, in the case of the remaining US dollar settings.

**LIBOR**

- LIBOR is a benchmark interest rate at which major global lend to one another in the international interbank market for short-term loans.
- LIBOR, which stands for London Interbank Offered Rate, serves as a globally accepted key benchmark interest rate that indicates borrowing costs between banks.
- The rate is calculated and published each day by the Intercontinental Exchange (ICE).
- LIBOR is the average interest rate at which major global banks borrow from one another.

- It is based on five currencies including the US dollar, the euro, the British pound, the Japanese yen, and the Swiss franc, and serves seven different maturities—overnight/spot next, one week, and one, two, three, six, and 12 months.
- The combination of five currencies and seven maturities leads to a total of 35 different LIBOR rates calculated and reported each business day.
- The most commonly quoted rate is the three-month U.S. dollar rate, usually referred to as the current LIBOR rate.

### Why the transition from Libor?

- The rate isn't sustainable because of a lack of transactions providing data. Libor became a byword for corruption after traders were caught manipulating the benchmark, leading to about \$9 billion in fines and the conviction of several bankers.
- The London Interbank Offered Rate (Libor) transition opens up a sizeable business opportunity for large consulting firms such as PwC, KPMG, EY and Deloitte and also for global IT firms, including leading players in India.
- Regulators globally have asked firms to move away from Libor to other alternate, risk-free rates (RFRs)

## 11. RBI joins with 12 other regulator to tackle greenwashing risk

**Subject: Economy**

**Section: Monetary Policy**

**Concept :**

- The **Global Financial Innovation Network (GFIN)** is organizing its first-ever Greenwashing TechSprint to combat greenwashing risks in financial services.
- The **Reserve Bank of India (RBI)** has announced its participation among **12 other international regulators in this initiative** to develop a tool that helps the market and regulators address the issue.
- The central bank noted the number of investment products marketed as 'green' was growing.
- **Greenwashing risks:**
- Greenwashing risks in **financial services refer to the practice of making exaggerated, misleading, or false claims about the environmental, social, and governance (ESG) characteristics of investment products or services.**
- This is done to attract investors who are interested in sustainable or responsible investing, but can ultimately result in harm to the environment or society.

### **Global Financial Innovation Network (GFIN)**

- **Global Financial Innovation Network (GFIN), an international network of more than 50 regulatory agencies** worldwide working together to support financial innovation in the best interests of consumers.
- Formally launched in January 2019, GFIN seeks to provide a more efficient way for firms to interact with regulators as they seek to develop, execute, and distribute new innovations.
- GFIN also creates a new framework for cooperation between financial services regulators on innovation-related topics as they share different experiences and approaches.

### **The three main functions of GFIN are to:**

- Act as a network of regulators to collaborate and share experiences of innovation in respective markets, including emerging technologies and business models
- Provide a forum for joint policy work and discussions
- Give firms an environment that allows for trials of cross-border solutions

## 12. What the govt's new GST compliance measures say and how they could impact businesses

**Subject :Economy**

**Section: Fiscal Policy**

**Context:**

In two significant measures to curb tax evasion and increase compliance under the Goods and Services Tax (GST) regime, the government has decided to **lower the threshold for businesses to generate e-invoice** for business-to-business (B2B) transactions, from Rs 10 crore to Rs 5 crore, and has rolled out the automated return scrutiny module for GST returns in a backend application for central tax officers.

**Concept:**

### What is the automated return scrutiny module?

- It aims to enhance tax compliance, reduce manual intervention and increase tax administration efficiency by using data analytics.
- The **Automated Return Scrutiny Module, integrated into the ACES-GST backend application, leverages data analytics to identify risks and discrepancies in GST returns.**
- Tax officers can scrutinize GST returns of Centre Administered Taxpayers selected based on data analytics and risks detected by the system. The module automatically generates alerts in cases of non-compliance.
- The Automated Return Scrutiny Module's implementation has begun with the scrutiny of GST returns for the financial year 2019-20
- It was implemented by **The Central Board of Indirect Taxes and Customs (CBIC)**

### What are the changes for e-invoicing and its impacts?

- The government lowered the threshold for businesses to **generate e-invoice for business-to-business (B2B) transactions to Rs 5 crore from Rs 10 crore under GST**. The changes will come into effect from August 1
- **e-Invoicing' or 'electronic invoicing' is a system in which B2B invoices and a few other documents are authenticated electronically by GSTN for further use on the common GST portal.**
- Reduction in the e-invoicing threshold helps to **boosting GST revenue collections and checking frauds, it will also increase compliance requirements for smaller businesses**
- For companies, **e-invoicing-compliant result in proper flow of input tax credit** and reduce the credit issues.

### Goods and Service Tax:

- The GST **aims to streamline the taxation structure** in the country and **replace a gamut of indirect taxes with a singular GST** to simplify the taxation procedure.
- It has been established by **the 101st Constitutional Amendment Act**.
- It is an indirect tax for the whole country on the **lines of "One Nation One Tax"** to make India a unified market.
- The Goods and Services Tax (GST), rolled out in July 2017, **marked a major shift from the traditional production-linked tax to a consumption-based tax.**
- The new regime **subsumed state levies** such as VAT, sales tax, octroi/entry tax together with central levies such as central excise and service tax.
- **States gave up some of their taxation rights in lieu of the Centre** passing on their revenue share under GST and **also compensating them for potential revenue losses in the first five years.**
- It is **levied on the value addition** and provides set offs. As a result, it **avoids the cascading effect or tax on tax** which increases the tax burden on the end consumer

### 13. Expected Credit Loss (ECL)-based loan loss provisioning framework

#### **Subject : Economy**

#### **Section: Monetary Policy**

#### **Concept :**

- Banks have requested the RBI for one more year's time to implement the system of Expected Credit Loss (ECL) for provisioning of loans.

#### **Background**

- In January 2023, the RBI came out with a **draft guideline proposing adoption of expected credit loss approach for credit impairment.**
- It said the banks will be given a one-year period after the final guidelines are released for implementation of new framework.
- **RBI is yet to announce the final guidelines on ECL norms.**
- However, some of the rating agencies have said that final norms on this may be notified by FY2024 for implementation from April 1, 2025.

#### **Loan-loss provision**

- The **RBI defines a loan loss provision as an expense that banks set aside for defaulted loans.**
- In other words, a loan loss provision is a cash reserve that banks set aside to cover losses incurred from defaulted loans.
- Basically, it is an income statement expense banks can tap into when borrowers are unlikely to repay their loans.



- In the event of a loss, instead of taking a loss in its cash flows, the bank can use its loan loss reserves to cover the loss.
- The level of loan loss provision is **determined based on the level expected to protect the safety and soundness of the bank.**

### Present Approach

- Banks in India are currently required to make **loan loss provisions based on incurred loss model.**
- This model assumes that all loans will be repaid until evidence to the contrary (known as a loss or trigger event) is identified.
- Only at that point is the impaired loan (or portfolio of loans) written down to a lower value.

### Problem with the incurred loss-based approach

- The incurred loss approach requires banks to provide for losses that have already occurred or been incurred.
- The delay in recognising expected losses under this approach was found to exacerbate the downswing during the financial crisis of 2007-09.
- Faced with a systemic increase in defaults, the delay in recognising loan losses resulted in banks having to make higher levels of provisions.
- This ate into the capital maintained by the bank which in turn affected banks' resilience and posed systemic risks.
- Further, the delays in recognising loan losses overstated the income generated by the banks.
- This, coupled with dividend payouts, impacted their capital base because of reduced internal accruals — which too, affected the resilience of banks.

### Expected Credit Loss (ECL) for provisioning of loans

- RBI has proposed a framework for adopting an expected loss (EL)-based approach for provisioning by banks in case of loan defaults.
- Under this practice, a **bank is required to estimate expected credit losses based on forward-looking estimations.**
- Under this, banks will need to classify financial assets into one of three categories — **Stage 1, Stage 2, or Stage 3**
- This **classification will depend upon the assessed credit losses on them, at the time of initial recognition as well as on each subsequent reporting date, and make necessary provisions.**

## 14. United States Debt Ceiling Crisis

### Subject :Economy

### Section: Fiscal Policy

#### Concept :

- With the ongoing U.S. debt ceiling crisis, finance leaders of the Group of Seven (G7) nations warned for further global economic uncertainty

#### Background

- On January 19, 2023, the **United States hit its debt ceiling limit of \$31.4 trillion**, leading to a debt-ceiling crisis.
- Recently, the U. **Treasury Secretary has notified the U.S. Congress that the country could default on its debt as early as June 1, 2023 if the White House does not reach a consensus to raise or suspend the debt ceiling.**

#### What is the 'US Debt Ceiling'?

- It refers to the **maximum amount of money that the United States government is authorized to borrow to fund its operations and meet its financial obligations.**
- It is a **legal limit set by Congress** on the total amount of outstanding debt that the government can accumulate.
- The debt ceiling was **established by the US Congress in 1917 during World War I** to make the federal government fiscally responsible.

#### What happens when the Government reaches Debt Ceiling?

- When the government reaches the debt ceiling, it cannot legally borrow any more funds to cover its expenses.

- At that point, the **Treasury Department must employ various measures, known as “extraordinary measures,”** to continue financing the government’s operations without surpassing the debt limit.
- These **measures can include reallocating funds from other areas, suspending certain government investments, or using accounting techniques to create additional headroom.**
- If the **debt ceiling is not raised or suspended by Congress, the government may face difficulties in meeting its financial obligations,** potentially leading to a default.

#### What happens if the debt ceiling isn’t raised?

- The most severe consequence of not raising the debt ceiling is the risk of a default by the United States government.
- When the government reaches the debt ceiling, it means it can no longer borrow money to meet its financial obligations, such as paying its debts, Social Security benefits, government salaries, and other critical expenses.
- A default on these obligations would have severe consequences for the economy and financial markets, both domestically and globally.

#### Implications of US’ defaults on its debt

##### Domestic implications for US:

- **Higher borrowing costs:** Following a default, the United States would face higher borrowing costs to finance its debt. Higher borrowing costs can dampen investment, discourage borrowing, and hinder economic growth.
- **Economic recession:** The uncertainty and disruptions caused by a default would undermine consumer and business confidence, leading to reduced spending and investment. Government spending would need to be drastically cut, potentially resulting in layoffs, reduced public services, and a contraction in economic activity.
- **Social and political consequences:** The cuts in government spending could affect healthcare, education, and social welfare. This could lead to public dissatisfaction and political tensions.

##### Global implications

- **Economic slowdown:** A US default would have ripple effects on the global economy. **Export-oriented countries heavily reliant on US demand** would be particularly affected.
- **Financial market contagion:** A US default would send shockwaves through global financial markets. **Financial institutions around the world that hold US Treasury bonds would suffer losses,** affecting their balance sheets and potentially leading to financial instability globally.
- **Currency implications:** A US default could **undermine confidence in the US dollar** as the global reserve currency. This could encourage global de-dollarization efforts.
- **Geopolitical repercussions:** It could **diminish the United States’ credibility and influence in international affairs,** while other countries and blocs may seek to assert themselves on the global stage.

#### Past Instances of US Debt Ceiling Crisis

- The US government debt has increased under every single president since 1929, resulting in the debt ceiling being raised over 100 times, with occasional instances of suspension that have contributed to crisis-like situations.
- **In 2011:** The US reached a **crisis point of near default on public debt** and suspended the rise in the limit. The delay in raising the debt ceiling led to its first downgrade in the US credit rating, a sharp drop in the stock market, and an increase in borrowing costs.
- **Another one in 2013:** This time when the ceiling was reached again, the Treasury adopted extraordinary measures to delay a default. These measures included suspending investments in individual retirement funds of federal employees, the Civil Service Retiree’s and Disability Fund, the Postal Service Retiree Health Benefits Fund, etc.
- That apart, **the debt ceiling was suspended in 2015, 2017, and 2019,** but in all these years it was upwardly revised post a few months of suspension.
- **Does India have a Debt Ceiling Mechanism?**
- **India does not have a formal debt ceiling mechanism similar to the one in the United States.**
- The Indian government manages its borrowing and debt obligations through various measures, **including fiscal discipline, budgetary controls, and oversight by the Reserve Bank of India (RBI).**
- In India, the **government’s borrowing activities are governed by the provisions of the Fiscal Responsibility and Budget Management (FRBM) Act,** which sets targets for fiscal deficits and debt-to-GDP ratios. The FRBM Act aims to ensure prudent fiscal management and fiscal discipline by the government.



## 15. London Interbank Offered Rate (LIBOR)

**Subject : Economy**

**Section: Monetary Policy**

**Concept :**

- The Reserve Bank of India (RBI) has asked the banks and financial institutions to facilitate a complete transition away from the London Interbank Offered Rate (LIBOR) by the 1st of July 2023.

### **London Interbank Offered Rate (LIBOR)**

- LIBOR is a globally accepted benchmark interest rate at which major global banks may borrow from one another in the international (London) interbank market for short-term loans.
- LIBOR is used as a benchmark to settle trades in futures, options, swaps and other derivative financial instruments in over-the-counter markets and on exchanges.
- Furthermore, LIBOR is also used as a benchmark rate for consumer lending products such as credit cards, mortgages, student loans, corporate debt, etc.
- Every business day before 11 a.m. (London time), banks on the LIBOR panel make their submissions to Thomson Reuters, which is a news and financial data company.
- This LIBOR panel comprises commercial bankers such as J.P. Morgan Chase (London branch), Lloyds Bank, Bank of America (London branch), Royal Bank of Canada, UBS AG, etc.
- The contributed rates are then ranked based on the LIBOR submission.
- During the ranking process, extreme quartiles are excluded and the middle quartiles are averaged to derive the LIBOR.
- This is in line with the idea of being as close to the median as possible.

### **Controversy surrounding LIBOR**

- Recently, there have been efforts to phase out LIBOR because of its role in worsening the Financial Crisis of 2008 and also due to the scandals involving LIBOR manipulation among rate-setting banks.
- Critics have pointed out that the mechanism adopted by LIBOR relied heavily on banks to be honest with their reporting disregarding their commercial interests.
- Investigations have revealed a long-lasting scheme among various banks to manipulate rates in order to acquire more profit.

### **Other alternatives to LIBOR**

- The U.S. Federal Reserve in 2017, announced the **Secured Overnight Financing Rate (SOFR)** as an alternative to LIBOR.
- Post the introduction of SOFR, new transactions in India were to be undertaken using the SOFR and the **Modified Mumbai Interbank Forward Outright Rate (MMIFOR)**, replacing LIBOR and its corresponding domestic Mumbai Interbank Forward Outright Rate (MIFOR).
- **SOFR is a rate produced by the U.S. Federal Reserve Bank based on transaction data (observable repo rates which are collateralised by U.S. Treasury securities) and is not based on estimates by experts as in LIBOR.**
- Thus, **SOFR is considered to be more accurate and less prone to market manipulation.**
- **RBI had asked banks in India to assess their LIBOR exposures and initiate their preparations to adopt alternative reference rates.**
- Contracts that were signed after December 31, 2021, were told not to use the LIBOR as a reference rate and the contracts that were entered before the date were to have fallback clauses for revised considerations when the LIBOR is completely phased out.

## 16. SEBI allows direct access for FPIs in commodity derivatives

**Subject : Economy**

**Section: Capital Market**

**What is Direct Market Access?**

Direct market access (DMA) is a way of placing trades directly onto the order books of exchanges.

## 17. Cong freebies come with heavy price tag for exchequer

**Subject : Economy**

## Section: Fiscal Policy

**Freebies** that are usually distributed include goods like bicycles, smart phones, TVs, Laptops and waivers on bills (water, electricity, etc.). **Freebies and poll promises are different from subsidies** which are required for the proper functioning of a government to fulfill peoples' needs and may not be a part of government poll promises. However, it is sometimes confused with freebies.

### Why?

Political parties promise to offer free electricity/water supply, monthly allowance to unemployed, daily wage workers and women as well as gadgets like laptops, smartphones etc. in order to secure the vote of the people.

### Impact:

**Arguments in Favor of Freebies:** The model is neither sustainable nor economically viable.

- **Essential for Fulfilling Expectations-** helps win election
- **Balanced regional growth** -With the states that have comparatively lower level of development with a larger share of the population suffering from poverty, such kind of freebies become need/demand-based and it becomes essential to offer the people such subsidies for their own upliftment.
- **Reduce inequality of income and wealth**
- **Increase consumption and thus standard of living of masses**
- **Reduction in poverty**
- **Economic Push:** They help increase the demand that prevents the rate of growth from declining further. Free education and health are anyway justified because they are cases of 'merit wants' and increase productivity of labor.

### Associated Issues with 'Freebies':

- **Rise in fiscal deficit:** This places a huge economic burden on the exchequer of the state as well as centre.
- **Rise in inflation-**demand exceed the supply
- **Unproductive expenditure-**no multiplier effect to increase productive capacity of the economy
- **Against Free and Fair Election:** The promise of irrational freebies from public funds before elections unduly influences the voters, disturbs the level playing field and vitiates the purity of the poll process.
- It amounts to an unethical practice that is just like giving bribes to the electorate.
- **Against Equality Principle:** Distribution of private goods or services, which are not for public purposes, from public funds before the election violates several articles of the Constitution, including Article 14 (equality before law).
- **Burden of financing-**increase tax or debt.
- **Distort market determined pricing system**
- **Wastage of resources/Inefficient allocation of scarce resources.**

**At present no law prohibit political parties from announcing freebies.**

Such programmes further the Directive Principles of State Policy under Part IV of the Constitution.

- **Article 36** of the Constitution encourages the state to secure a just social order.
- **Article 39** says that the state shall make efforts to reduce the concentration of wealth and promote the common good

### Directive Principles of State Policy

DPSP (Directive Principles of State Policy) enumerated in Part IV of the constitution. It covers the Articles from 36 to 51.

The framers of the constitution borrowed this idea from the **Irish Constitution**.

The state should keep in mind all the DPSP before formulating any policy or law for the country.

- DPSPs are **non-justiciable**.
- DPSPs embody **welfare state**.
- DPSPs seek to establish **social and economic democracy**
- **Article 38 to 51** contains all the different DPSP's.

## 18. Regulatory Barriers to Trade

**Subject :Economy**

**Section: External Sector**

It is a type of Technical Barrier to Trade that countries use to restrict imports from other countries. Broadly trade barriers are tariff and non-tariff. Non-tariff barriers include subsidies, anti-dumping duties, regulatory barriers and voluntary export restraints.

**Technical Barriers to Trade (TBT) Agreement** aims to address this problem by ensuring that any technical barrier is backed by legitimate policy objective and is not used just for purpose of making trade difficult. For example, in name of consumer interest or environment countries will have complex requirements of labeling or testing thereby discouraging trade. India and Japan signed the Comprehensive Economic Partnership Agreement (CEPA) in 2011 giving free/low duty market access to most products but India has been unable to take advantage due to TBTs.

### 19. Overseas use of international credit card now part of Liberalized Remittance Scheme limit

**Subject: Economy**

**Section: External Sector**

**Finance ministry's changed rule on overseas use of international credit card kicks in from May 16, 2023**

**What is new change in rules?**

If you are paying through an international credit card abroad, you need to be cautious as such expenditure will now be treated as part of the limit under the Liberalised Remittance Scheme (LRS), according to the changed rules notified by the Finance Ministry.

**What is Liberalized Remittance Scheme?**

- This is the scheme of the **Reserve Bank of India**, introduced in the year 2004.
- All **resident individuals, including minors, are allowed to freely remit up to \$250,000 per financial year** (April–March) for any permissible current or capital account transaction or a combination of both.
- **Not Eligible:** The Scheme is **not available to corporations, partnership firms, Hindu Undivided Family (HUF), Trusts etc.**
- Though there are **no restrictions on the frequency of remittances** under LRS, once a remittance is made for an **amount up to USD 2,50,000** during the financial year, a resident individual would not be eligible to make any further remittances under this scheme.
- Remitted Money can be used for:
  - Expenses related to travelling (private or for business), medical treatment, study, gifts and donations, maintenance of close relatives and so on.
  - Investment in shares, debt instruments, and buy immovable properties in the overseas market.
  - Individuals can also open, maintain and hold foreign currency accounts with banks outside India for carrying out transactions permitted under the scheme.
- Requirements: It is mandatory for the resident individual to provide his/her **Permanent Account Number (PAN)** for all transactions under LRS made through Authorized Persons.

### 20. RBI regulations on green deposits

**Subject : Economy**

**Section: Monetary Policy**

**Concept :**

- Recently, the Reserve Bank of India (RBI) came up with a regulatory framework for banks to accept green deposits from customers.
- Under the new framework, banks that accept green deposits will have to disclose more information on how they invest these deposits.

**Green Deposits**

- Green deposits are **not very different from the regular deposits that banks accept from their customers.**
- The **only major difference is that banks promise to earmark the money that they receive as green deposits towards environment-friendly projects.**
- For example, a bank may promise that green deposits will be used towards financing renewable energy projects that fight climate change.
- A green deposit is just one product in a wide array of other financial products such as green bonds, green shares, etc., that help investors put money into environmentally sustainable projects.

**RBI's Regulatory Framework for Green Deposits:**

- It lays down certain conditions that banks must fulfill to accept green deposits from customers.
- Firstly, banks will have to come up with a set of rules or policies approved by their respective Boards that need to be followed while investing green deposits from customers.
- These rules need to be made public on the banks' websites.
- The banks will also have to disclose regular information about the
- Amount of green deposits received,
- How these deposits were allocated towards various green projects, and
- The impact of such investments on the environment.
- A third party will have to verify the claims made by banks regarding the projects in which the banks invest their green deposits.
- The RBI has come up with a **list of sectors that can be classified as sustainable and thus eligible to receive green deposits.**
- These include **renewable energy, waste management, clean transportation, energy efficiency, and afforestation.**
- The new rules are **aimed at preventing greenwashing, which refers to making misleading claims about the positive environmental impact of an activity.**
- For example, a bank may advertise that their green deposits will have a huge positive impact on the environment, while the actual impact may be minimal.

### **Will Green Deposits help Depositors/Investors and the Environment?**

- Depositors who care about the environment may get some satisfaction from investing their money in environmentally sustainable investment products.
- However, there are challenges, since the bank is only able to invest in a certain number of projects with green funds.
- When it comes to protecting the environment, green investing enthusiasts believe that putting money into green projects may be one of the best ways to help the environment.
- However, critics call green investing “a feel-good scam” that enriches only consultants.
- In a complex world, it can be extremely hard to know if a project is really environmentally sustainable.

## **21. Sovereign Ratings**

### **Subject :Economy**

### **Section: Capital Market**

#### **Concept :**

Sovereign credit rating is an assessment of a country's creditworthiness. It shows the level of risk associated with lending to a particular country since it is applied to all bonds issued by the government. Generally within the country treasury bills or bonds issued by the government are considered zero risk investment, but for international creditors, there is a perceived risk as in certain situations even national governments may become insolvent, as was seen recently with Sri Lanka and Pakistan. This may happen because of a lack of forex reserves, unsustainable government debt. Hence Sovereign Ratings become important.

#### **Factors:**

Credit rating agencies consider various factors such as the **political environment, economic status, and its creditworthiness** to assign an appropriate credit rating. Obtaining a good credit rating is important for a country that wants to access funding for development projects in the international bond market. Also, countries with a good credit rating can attract foreign direct investments.

The big three rating agencies are: Moody's Services, Fitch Ratings, and Standard & Poor's. Several factors such as following determine a country's sovereign rating:

- Per capita income
- GDP growth
- Rate of Inflation
- External debt
- Economic development
- History of defaults

The chart below shows the rating system of the three agencies.

Credit Ratings			
	S&P	Moody's	Fitch
Investment Grade	AAA	Aaa	AAA
	AA	Aa	AA
	A	A	A
	BBB	Baa	BBB
Speculative Grade	BB	Ba	BB
	B	B	B
	CCC	Caa	CCC
	CC	Ca	CC
	C	C	C
	D	D	D

S&P has recently maintained **‘BBB-’ (triple B minus)** with **‘stable outlook’** rating for **India**, which means that it is just above BB ie. speculative grade rating.

With regards to factors that influence India’s rating, we see following:

Factors favoring	Challenges
<ul style="list-style-type: none"> <li>Fast growing economy</li> <li>Strong external balance sheet</li> <li>Democratic institutions supporting policy predictability and compromise</li> </ul>	<ul style="list-style-type: none"> <li>Weak fiscal performance</li> <li>High debt</li> <li>Low per capita income</li> </ul>

### Rating Agencies

- A rating agency is a company that assesses the financial strength of companies and government entities, especially their ability to meet principal and interest payments on their debts.
- The rating assigned to a given debt shows an agency’s level of confidence that the borrower will honour its debt obligations as agreed.
- The Big Three Credit Rating Agencies: Fitch Ratings, Moody’s Investors Service and Standard & Poor’s (S&P) are the big three international credit rating agencies controlling approximately 95% of global ratings business.
- In India, there are six credit rating agencies registered under SEBI namely, CRISIL, ICRA, CARE, SMERA, Fitch India and Brickwork Ratings.

### Role of Rating Agencies in Capital Markets

- Rating agencies assess the credit risk of specific debt securities and the borrowing entities. In the bond market, a rating agency provides an independent evaluation of the creditworthiness of debt securities issued by governments and corporations.
- Rating agencies also give ratings to sovereign borrowers, who are the largest borrowers in most financial markets.
- Sovereign borrowers include national governments, state governments, municipalities, and other sovereign-supported institutions. The sovereign ratings given by a rating agency shows a sovereign’s ability to repay its debt.
- The ratings help governments from emerging and developing countries to issue bonds to domestic and international investors.
- Governments sell bonds to obtain financing from other governments and Bretton Woods institutions such as the World Bank and the International Monetary Fund.

## 22. Adani-Hindenburg Supreme Court Panel Report

**Subject :Economy**

### Section: Capital Market

**Context:** Supreme Court on Friday (May 19) made public the report of the court-appointed expert panel in the Hindenburg-Adani row case. SEBI is yet to submit its report, the expert panel in its report disclosed that SEBI has been investigating the ownership of 13 “opaque” overseas entities related to Adani since October 2020.

#### The committee covered the following:

- Market Volatility:** Report found high **volatility** in the securities market due to the Hindenburg-Adani row.
- On the first issue, the report says that while “there was certainly high volatility in Adani stocks after publication of the Hindenburg report”

- **Investor Awareness:** agreed with SEBI's steps on ensuring investors are making informed decisions, but questioned whether there is **too much information** for the average investor.
- **Regulatory failure** if any that led to the conclusions drawn by the Hindenburg report. panel said that SEBI is looking into whether Adani has floated regulations in three aspects.
  - Minimum public shareholding: Sebi regulations require a publicly listed company to have a minimum of 25% of its shares to be held by the public. To assess this SEBI is looking at the ownership of certain portfolio investors. (of 13 overseas entities, 12 are foreign portfolio investors)
  - Related Party transactions: SEBI (Listing Obligations and Disclosure Requirements) requires disclosure of transactions by listed companies with related parties that benefit related party (ie. Adani here). No comment as investigation still on.
  - Price Manipulation: No evidence yet. SEBI's active surveillance framework that tracks high price and volume movements has **not found any manipulation till now**, although several alerts were triggered, even before the Hindenburg report.
- The 6 member committee comprised of two former justices, one former SBI chairman, one securities lawyer and Infosys co-founder Nandan Nilekani.

#### Why the issue is important: Some fundamentals

Stock market 'Efficiency' requires that the price discovery, is determined by publicly available information only. In a 'perfectly efficient market', no one can make extra profits than any other. **Related party trading** and **insider trading** go against this principle.

Volatility is the name for variation in the price during a period. Abnormal volatility, is indicative of speculation or any other unfair practice, and is unhealthy from **investor confidence** point of view.

The 25% holding to be with public is a measure to ensure that big stakeholders cannot manipulate price of a stock.

The role of market regulator SEBI is most important in ensuring all of the above, hence concerns about regulatory failure.

### 23. Centre's decision to withdraw Rs. 2000 notes from circulation

**Subject :Economy**

**Section: Monetary Policy**

**Specifics:**

- Not demonetization: Firstly the note will continue to be legal tender, even though public is encouraged to deposit/exchange these by 30<sup>th</sup> September.
- Extended window for deposit/exchange.

**Reasons:**

- Exact reason not given, but the RBI's stand is to discourage high value notes.
- And these were introduced as a means of filling the currency vacuum created by demonetization in a short period of time, hence the high value.
- The withdrawal decision is seen in view of upcoming assembly and general elections, which see high cash demand.

**Impact on:**

- **economy:**
- Not likely to be major, as Rs. 2,000 notes constitute only about 10% of currency in circulation
- But small businesses and cash intensive sectors like agriculture and construction could see some disruption in short term.
- **Banking:**
- With 30<sup>th</sup> sept deadline, Banks will see their deposits rise.
- Bank liquidity will increase with higher cash holdings.
- **Bond Market:**
- As banks invest the excess deposits in government securities, we will see a short term drop in market interest rates in government bonds.



## 24. Foreign Venture Capital Investors (FVCI)

**Subject :Economy**

### **Section: Capital Market**

FVCI is an investor incorporated and established outside India, who invests primarily in unlisted securities of Venture Capital undertakings and Venture Capital Funds in India.

Venture Capital Funds in turn are pooled investment funds that invest in seek private equity (unlisted) in start-ups and small and medium enterprises with strong growth potential. These are generally considered **high risk- high return** investments. SEBI is recently formalizing the regulatory framework for FVCIs. It is recommended that they hold investments in demat format.

## 25. SWFT vs UPI

**Subject: Economy**

### **Section: External Sector**

SWIFT	UPI
<p><b>SWIFT</b> stands for “Society for Worldwide Interbank Financial Telecommunication”. It was developed in 1973 and it is a messaging network for international transactions.</p> <p>It is not a banking operation that transfers or stores the funds rather it is a <b>means to communicate</b> that the amount has been transferred securely</p> <p>Though an independent cooperative society it is indirectly controlled by Western allies as it indirectly follows Belgian Law and EU commands as well.</p> <p>As it has a monopoly on international transactions, whenever any nation challenges the Western ideology it is used as strategic tool to for economic isolation. Eg: Iran, Russia.</p>	<p>Unified Payment Interface (UPI) is a single-window mobile payment system developed by the National Payments Corporation of India (NPCI). It eliminates the need to enter bank details or other sensitive information each time a customer initiates a transaction.</p> <p>It is an <b>instant real-time payment system</b> which facilitates P2P and person-to-merchant transactions.</p> <p>The toughest barrier to UPI adoption is fraud or errors in real-time payments. Real-time payments are more vulnerable to social engineering frauds and there have been many cases when people have been cheated via digital transactions.</p>

Also to be noted:

- After Russian banks were cut off from SWIFT, the System for Transfer of Financial Messages (SPFS) was developed by Russia’s central bank as an alternative to SWIFT.
- It has been suggested India now should also start developing its **CBDC** or digital rupee-based **Global Payments Interface** (GPI) for cross-border payments.
- Japan, which said it was seriously considering joining Indian UPI to increase interoperability.
- UPI and/or RuPay are already available in countries like Singapore, Nepal, Bhutan and United Arab Emirates (UAE) for Indians travelling there.
- For non-resident Indians (NRIs), there are 10 countries which allow making payments (UPI) through their local phone numbers, including Australia, Canada, the UAE, Oman, Qatar, Singapore, Hong Kong, the UK and the US.

**NIPL for tech diplomacy:** NPCI International Payments Limited (NIPL) has been incorporated (“Company”) on April 3, 2020 as a wholly owned subsidiary of National Payments Corporation of India (NPCI). NIPL is devoted for deployment of RuPay (domestic card scheme) and UPI (mobile payment solution) outside of India.

## 26. Withdrawal of Rs. 2000 notes by the RBI: Reasons, concepts

**Subject: Economy**

### **Section: Monetary Policy**

- RBI issues and withdraws notes of various denominations under powers granted as per Section 24(1) of the RBI Act, 1934.
- Withdrawal is different from demonetization in that the currency in case of withdrawal still remains a **legal tender**, but becomes void in case of the latter.

The objective of the Reserve Bank's Clean Note Policy is to give the citizens good quality currency notes and coins while the soiled notes are withdrawn out of circulation.

- This has been done as part of '**Clean Note Policy**' as part of which RBI aims to ensure that currency notes and coins that are of:
  - Good quality, not soiled
  - Not counterfeit
  - Good security features
- The Reserve Bank has also instructed the banks to issue only good quality clean notes to the public and refrain from recycling the soiled notes received by them over their counters. The Reserve Bank has installed high speed **Currency Verification and Processing Systems (CVPS)** machines at all its offices which deal with currency. These machines are capable of processing 50,000-60,000 pieces per hour and soiled notes are shredded and briquetted on-line.
- All notes prior to 2005 have also been withdrawn by RBI earlier in 2014. This was done as per standard international practice of not having multiple 'series' of denomination in circulation, as newer notes had better security features. But any note prior to 2005 continues to be **legal tender**.
- For Rs. 2,000 notes although RBI has given a time limit to deposit/exchange, they will continue to be legal tender.
- Currency with the public is seen as a **leakage** out of the financial system as soon as it no longer serves as the **base** for creation of money as per **Fraction reserve banking**, wherein a certain multiple of credit can be created by the bank for every rupee held.
  - Around 2-3 million rupees banking liquidity leaks out as currency in circulation.

#### Process:

The RBI has established rules in place for the disposal of notes unfit for circulation.

The currency notes, after collection from the concerned banks, are deposited at the Issue offices of the Reserve Bank. After their grouping and sorting under the Currency Verification and Processing System (CVPS), the RBI examines the currency notes to determine their genuineness.

- Each CVPS installation is capable of processing up to 60,000 currency notes each hour. CVPS counts the notes and separates genuine ones from the fake currency notes. The fake notes are destroyed by shredding.
- The genuine currency notes which still had quality and life left for circulation before being deemed scrapped, are shredded in a way that they could be recycled into the new currency papers.
- This means that paper used to make you ₹2,000 currency note would eventually come back to your pocket in some other denomination.

#### What happens to fake or less-qualitative currency notes?

- They are shredded and converted into briquettes. Such briquettes are sold for industrial use through a tender invited by the Reserve Bank of India.
- In 2016, when India's Prime Minister Narendra Modi announced the demonetisation of about 89 per cent of the country's currency in circulation, RBI's state branch in Kerala state's Thiruvananthapuram sold it to India's only hardboard making factory, The Western India Plywoods Limited.
- The factory in the state's Kannur district reportedly uses a combination of around 5 per cent of the paper pulp created from these notes with 95 per cent of conventional wood pulp to make hardboards.
- The Kannur factory reportedly received around 80 metric tonnes of shredded demonetised notes in the first three weeks after November 8, 2016 when the demonetisation was implemented.

#### Background:

Ever since 1999, when the Governor announced the Clean Note Policy, several steps were taken for augmenting the supply of currency notes and coins. The members of public were urged **not to write on the currency notes and banks** were instructed to provide unrestricted facility for exchange of soiled and mutilated notes.

As per the Reserve Bank instructions, currency chest branches of the banks must offer, even to non-customers, good quality notes and coins in exchange for soiled and mutilated notes. Complaints, however, continue to be received in this regard from the public and trade bodies that these instructions have not been given full effect.



### Withdrawal of Rs. 2,000 notes to have following effects:

1. **Improve short term banking system liquidity:** As the withdrawn notes are deposited with banks, they will have excess liquidity, which will go towards:
  1. **Government securities:** Banks resort to parking excess funds in government securities.
  2. **Overnight money (Call money) market:** Generally the overnight interbank (call rate) is more than the repo-rate. But this may change with sudden increase in short term fund availability.
2. **Reduce short term interest rates:** The rates for government bonds will see a reduction, firstly for the t-bills and then later possibly for 3 and 5 year bonds also.
3. **Increased demand for Treasury bills:** The increased demand in auctions will result in higher prices for government bonds.
4. **Decrease bond yield ie. increase bond prices:** Bond yield is nothing but the implicit rate at which the face value of the bond is discounted to get today's price. Thus say a Rs. 1000 bond discounted by 10 % implicit rate is priced at Rs. 909. So bond price and yield follow an inverse relationship.
5. **Dip in cash:** Since all the 2000-rupee notes will come back in the banking system, we will see a reduction in cash in circulation and that will in turn help improve banking system liquidity

## 27. Green Shipping

### Subject :Economy

#### Section: Infrastructure

- Green shipping is an approach to shipping that aims to reduce emissions and pollutants released in the environment by using technology, cleaner fuels like LNG, renewables like green and blue hydrogen and digitization of the supply chain, implementing management practices like **JIT (Just in Time)**. The aim is to make shipping green and sustainable.
- The term is not formally defined anywhere but is an umbrella term for initiatives that aim to 1. improve, energy efficiency 2. Reduce fossil fuel use 3. Reduce greenhouse gas emissions 4. Reduce various other pollutants released because of shipping.
- Some solutions to achieving green-shipping:
  - Using **Liquefied Natural gas (LNG)** in place of the **High Sulphur Fuel Oil (HSFO)** that is mostly used. But LNG infrastructure is not available at most ports.
  - **Shore-side supply of electricity** (also called '**Cold Ironing**') allows ships to shift to the more efficient electric power when ships are docked in the port.
  - Shifting to use of **marine diesel**, which while costlier than HSFO/HFO but is also cleaner.
  - **Green/ Green-Hybrid Tugs:** Using non-fossil fuels like (Methanol, Ammonia, Hydrogen) to power the tugs used at ports. [Tugs are small vessels that tow mega-ships into the port, ensuring collision avoidance]
  - Greater **integration with Multi-modal transport** to the ports.
  - **Slow steaming** is the term for putting a limit to the speed at which a ship may go, this is related to the concept of Just-in-Time management.
  - **Reducing Empty containers:** Various carriers coordinate with each other to reduce transportation of empty containers.
  - **Ballast water management:** The contamination of the ballast water (water filled in ship for stability) results in sea pollution due to bacteria, microbes, larvae that may be released where they are alien, thereby harming the environment.
- Formal measures:
  - **International Maritime Organization (IMO)** has set clear standards, particularly with regard to sulphur content. In 2020, the **sulphur content** may only be half a percent.
  - Future measures include, integrating shipping into the **international trade of CO2 certificates**. Maritime trade was also excluded under the Paris Climate Protection Agreement of 2015, but could be included in future agreements.

#### Measures taken by India:

- The Ministry of Ports, Shipping and Waterways has announced 30% financial support for green shipping.
- Green Tug Transition Programme: 'Green Hybrid Tugs' will be used, 50% transition target by 2030.
- A **National Centre of Excellence in Green Port & Shipping (NCoEGPS)** has been set-up is the result of a collaboration between the Ministry of Ports, Shipping & Waterways, Government of India and the Energy and Resources Institute (TERI). NCoEGPS will act as a technological arm of MoPSW for providing the needed support on Policy, Research and Cooperation on Green Shipping

- Government plans to make India as the ‘**Global hub for building Green Ships**’ by 2030. With these initiatives, the Centre is aimed at playing a crucial role towards the achievement of **UN’s Sustainable Development Goal (SDG 14)** to sustainably manage and protect marine & coastal ecosystems from pollution, conservation & sustainable use of ocean based resources.
- **PM Gati Shakti – National Master Plan for Multi Modal Connectivity** along with the **Green Ports** initiative has already accelerated the development of green logistics supply chain in the country.
- The **Maritime Vision Document 2030**, is a 10 Year blueprint on India’s vision of a sustainable Maritime sector and vibrant blue economy.
- **Green Hydrogen Hubs** to be set up at JNPT, VO Chidambaram Port, Tuticorin. (Green Hydrogen is hydrogen produced by using Solar or Wind ie. renewable energy. Blue hydrogen is produced from natural gas and supported by carbon capture and storage.)
- JNPT, VO Chidambaram Port, Tuticorin to become **Smart Ports**. Smart port allows coordination between ships and the ports to decide on optimum speed that allows the ships to reach **Just-in-Time**, giving savings on fuel.

## QUICK FACT SHEET ON PORTS and SHIPPING in INDIA

Cargo Shipping = 151 MMT (Million Metric Tonne) in 2023

In-land Waterway Cargo = 126 MT (Metric Tonne) in 2023

Coastal berths infrastructure under Sagarmala Project

- 90 port modernisation projects have been completed

Various Initiatives to boost to boost coastal shipping:

The major ports are administered by the Shipping Ministry of the Central Government, while the minor ports are taken care off by the Ministry of the respective States where they are located.

### Some Points about Shipping Sector:

- 100% FDI through Automatic route
- 95% trade by volume, 70% by value

**Major Ports:** India has a total of 13 Major ports

#### West Coast

1. Kandla (Gujarat)
2. Mumbai (Maharashtra)
3. Jawaharlal Nehru Port Trust- NhavaSheva (Maharashtra): LARGEST port
4. Marmugao (Goa)
5. New Mangalore (Karnataka)
6. Cochin (Kerala)

#### East Coast

1. Tuticorin (Tamil Nadu)
2. Chennai (Tamil Nadu): SECOND LARGEST overall/ LARGEST on east coast
3. Ennore (Tamil Nadu)
4. Visakhapatnam (Andhra Pradesh)
5. Paradip (Orissa)
6. Kolkata, Haldia (West Bengal)
7. Port Blair, Haddo (Andaman and Nicobar Islands)

**Minor Ports: 189**

States/Union Territories	No of Minor Ports
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Gujarat	40
Maharashtra	53
Goa	5
Karnataka	10
Kerala	13
Diu & Daman	2
Lakshadweep Islands	10
Pondicherry	1
Tamil Nadu	15
Andhra Pradesh	12
Orissa	2
West Bengal	3
Andaman & Nicobar	23

Types of Ports based on type of harbor:

1. Natural

- a. River, Medium Seaport: New Mangalore Port
- b. deep-water, Large Seaport: Mumbai Port

2. Artificial

- a. Seaport: Ennore Port
- b. Medium deepseaport: Tuticorin Port
- c. Deep water port: Paradip Port
- d. Coastal Natural: Panaji Port

3. Coastal Breakwater

- a. River Natural, Medium Seaport: Haldia Port
- b. Artificial Large Seaport: Chennai Port

4. Coastal Tide Gate, Large Seaport: Nhava Sheva (JNPT) Port

5. Breakwater, Large seaport: Vizag Port

6. Backwaters seaport: Cochin Port

7. Open Roadstead, large seaport: Kandla Port

## 28. RBI's Economic Activity Index

**Subject :Economy**

### **Section: National Income**

Economic Activity Index that incorporates **27 high-frequency indicators** to gauge the dynamics of growth and output. RBI calls this estimation as '**nowcast**', or conditionally forecast, the **current quarter growth** by factoring in real-time activity across sectors to identify consistent economic patterns.

The idea is to use **machine learning tools** and **artificial intelligence** to project GDP numbers going forward, taking into account high-frequency data releases. The **27 indicators** include the **monthly Index of Industrial Production, rail freight, tax collections, oil prices, power supply and steel output, besides Purchasing Managers' Indices.**

### **RBI's Supply Chain Pressure Index**

**Index of supply chain pressures for India (ISPI)**, was developed by extracting common factors latent in **19 domestic and global variables** for the period 2005-2022, and has been found to **track supply pressures** on the Indian economy efficiently.

These indicators are classified under two broad categories:

- (i) **transportation and logistics**— Baltic Dry Index is used as a proxy for shipping rates. Truck freight rates as well as domestic railway and air freight traffic are used for domestic component of the index.
- (ii) **essential intermediates in manufacturing.**

It predicts industrial production, GDP and input costs and serves as a **lead indicator** for future **export volumes and inflation**. Thus ISPI acts as a macroeconomic early warning system for the Indian economy.

### 29. De-Risking vs Decoupling

#### **Subject :Economy**

#### **Section: National Income**

The term was brought in lime-light by European Commission president, Ursula von der Leyen in March 2023 when she said that EU would not follow calls to **de-couple** from China that began under **Trump**, and that it was not in Europe's interests to de-couple from China.

De-coupling was the stand that took root under President **Trump**, and was further continued under present President Joe Biden. This approach involves using trade barriers, bans and sanctions to counter China's emergence in strategic sectors that the US sees as a threat to its global dominance. De-risking is a counter-narrative that has emerged to soften that stance.

De-risking is the term that countries are referring to describe a **changed economic and foreign policy attitude** towards China. Countries like the US and EU are stressing that they want to strengthen their economic resilience by diversifying and deepening and '**de-risking**' their relationship with China, while not becoming inward looking or trying to prevent Chinese growth.

- Technically the word, de-risking means to move business away from areas that are considered risky in terms of the return that can be generated.
- In the context of China de-risking can be interpreted as a **reduction of the reliance on China in the economic sphere** — for the supply of materials or as a market for finished goods — so that potential risks to trade and disruption of supply chains are reduced. Recent G7 statement also said that it would be more interested in a China that played by **international rules**.
- US National Security Advisor (NSA) referred to **De-Risking** as having **resilient, effective supply chains and ensuring we cannot be subjected to the coercion of any other country.**
- This development can be seen in light of following events:
- The weather balloon incident where US shot down a supposedly weather balloon that US alleges was a spy balloon.
- US efforts to become self-sufficient in semiconductor production.

#### **China's view:**

China considers the actions of US to actually be of de-coupling nature and not de-risking. It has been facing pressure from the US in fields of information technology and manufacturing. US ban on export of certain advanced chips — which have military or AI applications to China.

History of de-risking (in context of financial sector, but same sense applies to China also):

- Banks de-risk by denying service to aid agencies that work in places like Syria that are under Sanction.
- With regard to finance as per experts De-risking can **create further risk and opacity into the global financial system**, as the termination of account relationships has the potential to **force entities and persons into less regulated or unregulated channels.**

### 30. UPI: Factors for success, impact

**Subject :Economy**

**Section: Monetary Policy**

**Unique characteristics of UPI:**

1. **Innovative:** Immediate Payment Service (IMPS) forms the base of UPI, its innovative application is behind UPI's success. Adopting a UPI ID rather than entering bank account numbers and IFSC codes has made transactions effortless.
2. **Inclusive:** UPI is not just limited to one App. Interoperability of the UPI allows one to send money or receive it from anyone on the UPI system irrespective of the particular application like GPay, Paytm etc.
3. **Security:** UPI provides reliable end-to-end security and data protection making it a secure platform. Use of a mobile number already registered with the bank ensures ease of compliance with RBI's KYC requirements.
4. **Ease of Use:** No need to enter any details like account number or IFSC code, which makes adoption by masses more likely.
5. **Contactless:** After Covid-19 there is a greater preference of contactless payments, hence people prefer UPI over debit/credit card.

**Other supporting factors (Macro factors):**

1. **Digital Connectivity:** Rise of e-commerce along with widespread availability of high speed mobile internet after entry of companies like Jio in telecom space have helped UPI's growth.
2. **Hardware Cost:** Rise in the use of smartphones linked to availability of feature packed affordable handsets has also been a contributing factor for UPI's success. (especially true for Rural areas)
3. **Government Policies:** Policy of promoting an integrated digital payment ecosystem with schemes like— **Aadhaar Enabled Payment System, FASTag, Rupay, and IMPS** have simplified payments, and projects like **DIGIDHAN Mission** through their promotion of digital transactions has also helped in UPI's growth. The **Jan Dhan accounts** through **financial inclusion** have ensured that most households are linked to formal banking.
4. **Merchant Discount Rate (MDR):** MDR is an amount/percentage paid to the payment gateway by the merchant; For cards the cost is around 1.8%. For UPI, the MDR is Zero. This helped in merchant's preference for UPI over debit/credit cards.

**Impact:**

- UPI has resulted in significant savings on transaction costs. It is forecasted that by 2026, an additional \$45.6 billion or 1.12% of India's GDP, will be boosted by savings made possible by UPI payment.
- UPI monthly transactions value touched a high of **14 Lakh Crore** in March 2023 with **865 crore** transactions. For FY23 the total UPI transaction value is around **Rs 139 Lakh Crore**.
- Debit card use is seeing 20% fall YoY. ATM withdrawals have also reduced to half.

#### **PPI and Interchange Fee**

The NPCI announced in March that UPI transactions made via prepaid instruments—such as wallets or cards—will carry an **interchange fee of 1.1%** for payments made to merchants starting April 1. The fee will not be applicable to person-to-person transactions or person-to-merchant transactions between a bank and the prepaid wallet.

### 31. Payment Banks 2.0: Search for growth and new income stream

**Subject :Economy**

**Section: Monetary Policy**

**Role and Contribution:**

- Have helped in extending monetary facilities to the underserved

**Challenges:**

- Not all are able to make sustainable profits. (The 3 profitable ones are: Airtel Payments Bank, Fino Payments Bank and Paytm Payments Bank)
- Present business model is not scalable.
- Competition from new-age fintech companies

- Out of 11 payment bank licenses given in 2014, 5 withdrew even before the start of operations, owing to fear of competition from fintech players.

#### **Demands of Payment Banks:**

- To allow them to lend to retail borrowers upto Rs. 2 Lakh (around the same as their average deposit size)

#### **Original intention of giving licenses in 2014:**

To enable cash and deposit management of small customers.

#### **Problem with allowing payment banks into lending space:**

- Lending requires strict adherence to capital adequacy norms and risk mitigation, which Commercial banks and NBFCs have to follow.
- Many payment banks are owned by Corporate houses which increases risk in allowing entry into the lending segment. (see Box below)

#### **Way ahead:**

- Profitable operations by the three (see above) payment banks shows that profits are possible.
- Huge scope of growth in **less-catered non-urban and rural areas**. This answers the scalability argument.
- These can replace Bank correspondents with more reliable infrastructure and transparent service.
- Present business model shows that a steady flow of fees income is good enough for profitable operations.
- With RBI granting the **payment aggregator** and **payment gateway licenses** to Fintech companies. In view of this licensing guideline of payments bank need an overhaul (only partial modifications were made in 2021)
- Instead of entry into the lending space, payment banks could be allowed to operate the end-to-end payments domain (**acquirer, gateway and processor** all in one). This will make the business model more sustainable apart from serving customers more efficiently.

#### **Why is corporate entry into banking problematic?**

Corporate-owned banks could lend to corporate houses run by the same promoters (**connected lending**), which can lead to a **conflict of interest** and **risk of bad loans**. Further it could result in further concentration of economic power in the hands of a few.

### **32. Certification of Organic Products**

#### **Subject : Economy**

#### **Section: Agriculture**

Organic farming is a farming system which avoids the use of synthetic inputs (such as fertilizers, pesticides etc.) using biological systems of nutrient mobilization and plant protection to produce toxic residue free food and achieve agri-ecosystem health and biodiversity.

*In News:* European Union Audit (by EU's DG Health and Food Safety) found many weaknesses in the certification of Indian organic products for export to EU:

1. Farmers of various organic producer groups (PGs) lacked knowledge of organic farming.
2. Infringement of NPOP norms, inadequate supervision and implementation of controls.

#### **For Domestic market and imports:**

**Food Safety and Standards Authority of India (FSSAI)** is the regulator (comes under Ministry of Health and Family Welfare). It has brought out the Food Safety and Standards (Organic Foods) Regulations in 2017. These Regulations recognizes **two systems** of certification i.e. Participatory Guarantee System (**PGS**) and National Programme for Organic Production (**NPOP**) and also acts as secretariat of the **National Accreditation Body**. The NPOP is notified under APGMC act and controlled by Agriculture Marketing Advisor, Directorate of Marketing and Inspection looks after domestic certification.

#### **For Exports:**

**National Programme on Organic Production (NPOP)** under the Ministry of Commerce and Industry regulates the organic farming certification. It sets standards for organic farming and organic produce and accredits certifying agencies. **Agricultural and Processed Food Products Export Development Authority (APEDA)** is the implementing agency for NPOP. These standards have been recognized by both the EU, Switzerland and the US. The NPOP is notified under FTDR Act and controlled by APEDA which looks after the requirements of export.



### Participatory Guarantee System

Participatory Guarantee System of India (PGS-I) is a **quality assurance system** that operates outside the ambit of certification agencies and is based on stakeholder participation (producers and consumers).

The foundational principle of PGS is **TRUST**, where consumers and producers come together under a shared vision. As part of this TRUST consumers trust that producers will be committed to protecting nature and consumer health through organic farming.

Other Programs related to Organic Farming:

- **Paramparagat Krishi Vikas Yojna (PKVY)**: It is a component of the Soil Health Management (SHM) project under NMSA (National Mission of Sustainable Agriculture) by Ministry of Agriculture and Farmers Welfare.
- **Mission Organic Value Chain Development for North East Region (MOVCD-NER)**: It is a sub-mission under the NMSA (National Mission for Sustainable Agriculture) of Ministry of Agriculture and Farmers Welfare launched in 2015 for the north-eastern States.

### 33. NITI Aayog's Governing Council to discuss Developed India Plan or 'Viksit Bharat@47'

#### **Subject : Economy**

#### **Section: National Income**

Key Points:

- Thrust on Micro, Small and Medium Enterprises (**MSME**) for **growth and job creation** in next 25 years.
- Cooperative Federalism to help achieve the goal
- Common **online platform** for all schemes, to reduce virtual clutter.
- To develop a robust **online dispute resolution system**.
- Strengthen **Annual Credit Plan** for better fiscal management.
- Implementation of strategic investment plan developed under '**Raising and accelerating MSME performance**' (Rs. 6,000 crore budgeted last year)

**Raising and accelerating MSME performance (RAMP)** is a World Bank assisted Central Sector Scheme, supporting various COVID-19 **Resilience and Recovery interventions** of the Ministry of MSME.

The programme aims at improving access to market and credit, strengthening institutions and governance at the Centre and State, improving Centre-State linkages and partnerships, addressing issues of delayed payments and greening of MSMEs. Funds would flow through RAMP into the Ministry's budget against **Disbursement Linked Indicators (DLIs)** to support ongoing MoMSME programmes, focusing on improving market access and competitiveness.

#### **Developed Country: what are the requirements/characteristics:**

1. High per capita GDP: At around \$2300 India presently qualifies as a Lower Middle income country.
2. Favorable Human Development Index: India presently ranks at 132nd position in HDI.
3. Greater share of tertiary and secondary sectors
4. Good infrastructure
5. Innovation

World Bank Classification of Countries based on per capita Income:

Low Income	<1,085
Lower Middle Income	1,086-4,255
Upper-Middle Income	4,256-13,205
High Income	>13,205

### 34. Tampon Tax

**Subject: Economy**

**Section: Fiscal Policy**

**What is Tampon Tax**

- Tampon tax refers to **consumption levies such as value-added tax (VAT)** that most countries charge on items such as **sanitary pads, tampons, panty liners and menstrual cups**.
- **Which countries have abolished the tampon tax:**
- **Kenya** became the **first country to scrap VAT on sanitary pads and tampons in 2004**,
- Among the latest countries to pass laws to abolish the tampon tax are **Mexico, Britain and Namibia**.
- Mainly in Europe, 17 countries have reduced the VAT on sanitary products, with Italy being the latest to do so this year.
- **In 2022, Scotland** became the **first nation to make tampons and sanitary pads free** and available at designated public places such as community centres, youth clubs and pharmacies.
- **Does India apply GST on menstrual products**
- The Indian government in **2018** decided to **abolish the tampon tax** and decided to **revoke the 12 percent tax levied** on sanitary pads in an effort to make them accessible to menstrual hygiene products accessible to all.

**Why are some countries unwilling to scrap tampon taxes:**

- VAT is an important source of revenue for governments and the reason why many countries still have a tampon tax. In countries belonging to the **Organisation for Economic Co-operation and Development (OECD)**, **VAT revenue represented 6.7% of their gross domestic product (GDP) in 2020**.
- VAT rates vary widely from country to country **from 5% in Canada to up to 27% in Hungary** and governments often have **different definitions of what is considered an essential good** that is exempted from the levy.

**What Is the Pink Tax:**

- It refers to the **extra cost that women have to pay on products designed and marketed specifically to them**, as compared to other generic or male equivalent same products. For e.g., **most salons charge more for women's haircut than men's**.

### 35. Mohenjodaro's Dancing Girl figurine:

**Subject: Economy**

**Section: Fiscal Policy**

**Context:**

- Prime Minister Narendra Modi inaugurated the **International Museum Expo in Delhi's Pragati Maidan** and also unveiled the Expo's mascot – a **"contemporised" version of the famous Dancing Girl of Mohenjodaro**.

**More about the dancing girl:**

- The Dancing Girl was discovered from excavation in **1926**, by British archaeologist **Ernest McKay** in a ruined house in the **'ninth lane' of the 'HR area' of Mohenjodaro's citadel**.
- The figurine is **made up of Bronze**.
- This exquisite casting depicts a **girl whose long hair is tied in the bun and bangles cover her left arm**.
- **Cowry shell necklace** is seen **around her neck**.
- Her **right hand is on her hip and her left hand is clasped in a traditional Indian dance gesture**.
- She has large eyes and a flat nose.

### 36. Angel Investor Categories, New Angel Tax Regime

**Subject : Economy**

**Section: Fiscal policy**

**Angel fund** is a sub-category of Venture Capital Fund (VCF) under Category-I **Alternative Investment Fund (AIF)** that raises funds from angel investors

**Key Points:**



- It raises funds by way of issue of units to **angel investors**. “Angel investor” means any person who proposes to invest in an angel fund and satisfies following:
  - net tangible assets of at least Rs. 2 crore,
  - Has investment experience, or is a serial entrepreneur, or is a senior management professional with at least ten years of experience
- Conditions for an Angel Fund:
  - It is a body corporate with a net worth of at Rs. 10 crore
  - It is an AIF registered under **SEBI (Alternative Investment Funds) Regulations, 2012** or a VCF registered under the **SEBI (Venture Capital Funds) Regulations, 1996**.
  - It shall accept, up to a maximum period of **3 years**, an investment of not less than **25 lakh** from an angel investor.
  - **Not have more than 49** angel investors.

### What are Alternative Investment Funds (AIFs) ?

Alternative Investment Fund or AIF means any fund established or incorporated in India which is a privately pooled investment vehicle which collects funds from sophisticated investors, whether Indian or foreign, for investing it in accordance with a defined investment policy for the benefit of its Investors.

Note: AIF **cannot make an invitation to the public** at large to subscribe its units and can raise funds from the sophisticated investors **only through private placement**.

Category I AIF:

Venture capital funds (Including Angel Funds)

SME Funds

Social Venture Funds

Infrastructure funds

Category II AIF

Category III AIF

#### Category I AIFs?

AIFs which invest in start-up or early stage ventures or social ventures or SMEs or infrastructure or other sectors or areas which the government or regulators consider as socially or economically desirable and shall include venture capital funds, SME Funds, social venture funds, infrastructure funds and such other Alternative Investment Funds as may be specified.

#### Category II AIFs?

AIFs which do not fall in Category I and III and which **do not undertake leverage** or borrowing other than to meet day-to-day operational requirements and as permitted in the SEBI (Alternative Investment Funds) Regulations, 2012.

Various types of funds such as real estate funds, **private equity funds** (PE funds), **funds for distressed assets**, etc. are registered as Category II AIFs.

#### Category III AIFs?

AIFs which **employ diverse or complex trading strategies** and **may employ leverage** including through investment in listed or unlisted derivatives. Various types of funds such as **hedge funds**, **PIPE Funds**, etc. are registered as Category III AIFs.

### Taxation Treatment of Angel Funds:

**Exemption: Government has set two separate criteria for tax exemptions**

1. Investment in **startups recognized** by the Department of Promotion of Industry and Internal Trade (DPII) of the Commerce Ministry. This is to support domestic start-ups.

2. **Certain entities** (see below) incorporated in **any of the 21 specified countries** are exempt. This is to attract more FDI from countries that have a **robust regulatory framework**. Exempt entities have to belong to one of the following:
- Government and government-related investors such as central banks, Sovereign Wealth Funds, International or multilateral organisations with government having equity of 75% or more.
  - Banks or Insurance companies, entities registered with the SEBI as Category-I foreign portfolio investor (FPI)
  - Endowment Funds associated with a university, hospital or charity
  - Pension Funds

List of countries for which specified entities are exempt in terms of Angel Tax are: Australia, Austria, Belgium, Canada, Czech Republic, Denmark, Finland, France, Germany, Iceland, Israel, Italy, Japan, South Korea, New Zealand, Norway, Russia, Spain, Sweden, the UK and the US

### 37. Fallback liability Clause in e-commerce Rules

**Subject : Economy**

**Section: Fiscal policy**

The **Ministry of Consumer Affairs** notified the **Consumer Protection (E-Commerce) Rules, 2020** under the Consumer Protection Act, 2019. Several changes were brought to the E-Commerce Rules in June 2021, which included specific flash sales, mis-selling of goods and services, the appointment of grievance redress mechanisms. It also introduced the concept of 'fallback liability'.

**Fallback liability** intends to make **e-commerce platforms responsible** for any negligence or wrongdoings of sellers in relation to product delivery or sale of defective products.

The Issue:

- Under the **Consumer Protection Act, 2019**, the **seller is held accountable** for selling a defective product or causing harm to the consumer through it. However, under the ecommerce rules, the platforms, not sellers will be held liable/responsible.
- It has been pointed out that FDI norms prevent these platforms from having control over the inventory sold on their sites but they are being made responsible for quality of the products.

Possible adverse Impact of the provisions:

- Marketplaces as well as consumers may adopt risk averse strategies that **limit their engagement to large sellers** having the resources to shoulder consumer liability and ensure product quality standards.
- Can impact the growth of the digital economy, and restrict MSMEs from benefiting from rise of e-commerce
- May worsen the ease of doing business in India by increasing legal, compliance burden for any new enterprise.
- It will also increase the regulatory burden and costs for the companies too.
- It does not penalize bad actors that may "game" the framework as they are shielded from direct action. This will create a negative bias even against genuine small sellers.

### 38. The Green Deposit Framework

**Subject : Economy**

**Section: Monetary Policy policy**

A green deposit is an interest-bearing instrument received by banks for a fixed period, the proceeds of which are earmarked for green-financing, such as funding of renewable energy projects. The Reserve Bank of India (RBI) in April 2023 issued a framework for banks to accept and promote green deposits. At present banks offering green Housing Development Finance Corp (HDFC), IndusInd Bank, Federal Bank, HSBC and DBS Bank. It is a step towards **ESG** (Environmental, Social, and Governance) **investing**.

Some pointers as per the RBI framework:

- Banks will offer the deposits as cumulative/ non-cumulative deposits. On maturity, the green deposits would be renewed or withdrawn at the choice of the depositor.
- The green deposits shall be **denominated in rupees only**.
- Banks and NBFCs shall put in place a comprehensive board-approved policy on green deposits, laying down all aspects in detail for the issuance and allocation of green deposits.

- The framework applies to all **scheduled commercial banks** and **small finance banks** (except for regional rural banks and local area banks) and **non-banking finance companies** (including housing finance companies).
- Both corporate and individual customers can invest in green deposits.
- Allocation of funds raised through green deposits during a financial year shall be subject to an independent Third-Party Verification (TPV) on an annual basis.

Where can the money be invested:

- Although banks offer **nearly similar interest rates** on both green deposits and fixed deposit schemes, the **end-use of the funds is different**.
- The differences between use of fixed deposit and green deposit can be seen in table below:

Fixed deposit	<ul style="list-style-type: none"> <li>❖ Lend or invest in even carbon-heavy sectors</li> <li>❖ Colloquially called 'Black Deposit' in contrast to Green deposits.</li> </ul>
Green deposits	<ul style="list-style-type: none"> <li>❖ Cannot use proceeds from green deposits for non-environment friendly projects.</li> <li>❖ Cannot be used for: new or existing extraction, production and distribution of fossil fuels, nuclear power, waste incineration, alcohol, weapons, tobacco, gaming, landfills, and palm oil industries.</li> <li>❖ Can be used to fund projects in <b>9 sectors</b> — renewable energy, energy efficiency, clean transportation, climate-change adaptation, sustainable water and waste management, pollution prevention and control, green buildings, management of living natural resources, and biodiversity conservation.</li> </ul>

### 39. Govt moots policy interventions for women empowerment

**Subject: Economy**

**Section:**

Government has asked Ministries and States to lay out different plans for **gender parity** and restoring **dignity of women**.

Conceived by the NITI Aayog in consultation with the government and other experts, this is part of an overall women empowerment initiative the Centre desires to achieve through:

- sectoral policy interventions
- gender sensitization
- effective criminal investigation and justice system.

Ministry	Initiative mooted
<b>Ministry of Women and Child Development and MHA</b>	<b>'One Nation, One Helpline'</b> through integration of all helplines for women with a single emergency response number '112' and link them with 'One Stop Centres' and 'District Child Protection Units' as a solution to violence against women.
<b>Ministry of social justice</b>	To oversee the steps States and UTs take to

	increase child marriage prohibition
<b>Education Ministry</b>	To to come up with gender sensitive curriculum for children on upholding dignity and respecting rights of women
<b>Minister of Social Justice and Empowerment</b>	Operationalisation of “hubs for empowerment of women” at State, UT and district levels, opening women hostels in industrial and economic zones, raising women self help groups (SHGs) as brands and unicorns.
<b>Private sector</b>	Gender Equality Index based ranking of top 500 companies and entities to disclose compliances under the Maternity Benefit Act, the Sexual Harassment of Women (prevention), Prohibition and Redressal) at Workplace Act, 2013 and Code on Industrial Relation
<b>Banks</b>	Every bank will have to own up 100 districts and recognise at least one woman SHG and reward the best of the lot for financial discipline
<b>Ministry of Industries and Commerce</b>	will have to pitch for coordination, requesting all States and UTs to select 30 to 40 companies and MSMEs and women SHGs and tie them up for handholding and promoting entrepreneurship.
<b>Ministry of Home Affairs</b>	Special recruitment drive for women as forest guards is also on the cards and the Aayog has planned efforts to increase their numbers as drivers, bus conductors, tourist police and guides
	End to End monitoring of crime against women through interoperable criminal justice system (ICJS) which is part of Supreme Court’s ecommittee for seamless transfer of data and information among courts, police, jails and forensic laboratories

#### 40. Challenges of climbing Mt Everest

**Subject :Economy**

**Section: Capital market**

**Context**

The recent death of Australian man Jason Kennison after reaching the summit of Mount Everest highlights how dangerous mountain climbing can be.2023 year will be one of busiest and deadly seasons so far with 11 confirmed deaths.

**What makes Mount Everest so deadly**

According to the Himalayan database more than 310 people have lost their lives on Mount Everest since 1922.The dangers faced by climbers pushing for the summit of Mount Everest are vast. These include the risk of avalanche

,falling rocks/ice ,dangers crossing the Khumbu icefall ,hypothermia from exposure to extreme cold, falls, severe fatigue and exhaustion and illness associated with low oxygen like

- Acute mountain sickness
- High-altitude pulmonary oedema
- High-altitude cerebral oedema.

At base camp of Everest the oxygen is 50% to that of mean sea level and at summit it falls to 30%.Of all the deaths 35% died due to fall ,22% due exhaustion,18 percent due to altitude sickness and 13% due to exposure. Almost 84% of deaths among non-sherpas occurred during descent after successfully climbing the summit of Mt Everest

#### 41. RBI net seller of US dollar

**Subject :Economy**

**Section: External Sector**

**Context:**

In FY 2023, the Reserve Bank of India(RBI) became a net seller of the US dollar after remaining a net purchaser for three consecutive years. It sold \$ 25.52 billion on a net basis in the spot foreign exchange market.

#### **Why did the RBI became net seller of dollars**

The RBI's decision to sell the greenback was to prop up the rupee, which depreciated by almost Rs 6,or 8 percent, to 82 level against the dollar as on March 31,2023,from 76 as on April 1,2022.During the previous fiscal, higher import bills due to surge in oil prices after Ukraine war leading to surging US dollar demand to buy crude oil, global inflation leading to raising of interest rates by US federal reserve ,leading investors to invest in US economy further draining foreign exchange reserve towards US economy. More than 37000 crores of foreign portfolio investments have been pulled out in equity markets and 9000 crores in debt market.

#### **Income of RBI by selling US dollars**

RBI generated huge profits from sale of US dollars, so much so that it transferred 87,000 crores this fiscal to the central government, a 188% jump from 30,500 crores in fiscal year 2021-22.

#### 42. SEBI to bring regulations for financial influencers (Finfluencers)

**Subject :Economy**

**Section: Capital market**

*In News:* SEBI has asked finfluencer P R Sundar to deposit 6 crore as disgorgement for selling investor courses without SEBI approval, and has been banned for a year from the securities market.

Key Elements that regulation should address:

- **An unambiguous definition of financial advice:** In the absence of a holistic definition of financial advice, it has been difficult to regulate activities of finfluencers. There is also a need to **differentiate** between **opinion and advice**. At present SEBI provides following two Regulations regarding financial advice:
  - An advice relating to investing whether written, verbal or through any other means of communication for the benefit of the client, has been termed as 'investment advice' under Regulation 2(1)(l) of the SEBI (Investment Advisers) Regulations 2013. But the regulation **explicitly exempts advice given through social media by finfluencers**.
  - Another category of advice is covered under SEBI (Research Analysts) Regulations 2014 (SEBI Research Analyst Regulations) through research report under Regulation 2(1)(w). Unfortunately, financial advice from a finfluencer will be excluded from its ambit, as a research report can be provided only by a certified research analyst by SEBI which requires a post graduate degree from National Institute of Securities Markets under Regulation 7(1)(iii). Hence, no Indian legislation or guidelines provide a concise definition of 'financial advice' that is applicable over the information provided by finfluencers.
- **Mandatory disclosures:**
  - SEBI requires registered research analysts and financial advisors to disclose their financial interest and any form of compensation received from the company whose financial products and services are being advertised. Finfluencerstoo need to be mandated to disclose such arrangements.

- Additionally Influencers should disclose whether they hold a particular security on which they are making a recommendation.
- **Unsolicited Advice:** Social media allows anyone to give their opinion on a subject. But just having a large following does not give one the right to give misleading advice. Hence unsolicited advice needs to be curbed.

#### 43. Textile PLI 2.0

##### **Subject: Economy**

##### **Section: National Economy**

The second edition of the **Production linked incentive (PLI) Scheme** for textile has been put up for approval of the Cabinet. The highlights are as follows:

- Outlay of Rs. 4,307 crore
- **Enhanced coverage** to now also include manufacture of garments, textiles and accessories of **both natural and man-made fibres**. (earlier only man-made fibre fabrics and apparels; and **Technical textiles** were covered)
- The decision has been made as only Rs. 6,000 crore out of the Rs. 10,683 crore corpus has been used.
- Enhance **larger participation** in producing value added **finished textiles**, which requires low investment but has high employment potential.
- Proposed minimum investment and turn-over criteria to be low so as to encourage MSME participation. Minimum investment likely to be in the 15-45 crore range with 30-90 crore turnover.
- Incentives of 8-10 % are likely.
- Earlier only newly registered companies could participate. This provision is to be relaxed to **allow all companies registered** in India. For existing companies **investment in only new machines** will be considered to qualify for the capital required guidelines in addition to **maintenance of separate accounts** towards production under the PLI Scheme.

##### **Various products of the Textile industry:**

**Fibre:** Is the thread that is used to make fabric or textile. These are classified as follows:

<u>Natural Fibres</u>	
Cellulosic Fibres	Cotton, Flax, Jute, Sisal, etc.
Protein Fibres	Wool, Silk, etc.
Mineral Fibre	Asbestos
<u>Man-made Fibres</u>	
Regenerated Fibres	Unmodified: Rayon, Lyocell) and Modified: Cellulose acetate and triacetate
Synthetic Fibres	Polyester, polyamide, polyacrylic, polyurethane
Refractory and Industrial fibres	Ceramic, Carbon, Glass

**Garment:** It is a finished stitched clothing made out of various textiles.

**Apparel:** It encompasses both garments and accessories like purse, shoes etc.

**Textile:** It is a broader term applied to all output derived from weaving any fibre. It may be a finished or unfinished product. All fabrics are textiles.

**Technical Textile:** These are defined as textile materials and products used primarily for their technical performance and functional properties rather than their aesthetic or decorative characteristics. They are manufactured using natural as well as man-made fibres. Examples are diapers/sanitary pads, conveyor belts, parachutes, surgical masks etc.

#### 44. NavIC 2nd Gen

##### **Subject: Economy**



## Section: National Economy

The Indian Regional Navigation Satellite System (**IRNSS**) also referred to as Navigation with Indian Constellation (**NavIC**) is a regional satellite navigation system that used 7 satellites for its positioning services. Recently it is being upgraded to the next gen version.

**2nd gen** satellite (**NVS-01**) launched. Key changes:

- Heavier than existing satellites
- GSLV Rocket launched. At present 7 satellites being lighter were launched by PSLV rockets.
- Atomic clock onboard (**Rubidium atomic clock** developed by Space-Application Centre- Ahmedabad). Only a few select countries have this technology.
- Will use **L1 frequency** in addition to existing L5 and S frequency. L1 is better for **wearable devices** which run on low power and use single frequency chips.
- 2nd gen satellites will have longer mission life of over **12 years**. (10 years at present)

What all IRNSS satellites provide:

- Location services: It provides Standard Position Service (SPS) for civilian users and Restricted Service (RS) for strategic users.
- Messaging services to provide disaster warning or potential fishing zone messages to fishermen.
- Public vehicle safety, power grid synchronization, real time train information systems and fishermen safety
- Following uses to be integrated: common alert protocol based emergency warning, time dissemination, geodetic network, UAV navigation etc.

## 45. Digital India Bill Draft

**Subject: Economy**

## Section: National Economy

Draft Bill is being prepared, it will replace the Information Technology Act, 2000 (the present 'Internet Law'). It is a key pillar of **framework of technology regulations** the which also includes the draft **Digital Personal Data Protection Bill, 2022, Indian Telecommunication Bill, 2022**, and a **policy for non-personal data governance**

Why new law is needed:

- The IT Act, 2000 is dated as it was passed in the early days of the internet.
- Limited in scope, thus restricting the government from enacting various rules.
- Issues of user harm like cyber bullying; women & child safety; fake news; unfair trade practices.
- Need for global standard Cyber Laws.
- To ensure Open Internet.
- Regulate emerging technologies like Artificial Intelligence.
- Required to achieve a \$1 trillion digital economy of 2026.

An Open Internet should have

1. Choice
2. Competition
3. Online diversity
4. Fair market access, and
5. Ease of Doing Business and Ease of Compliance for Startups

Key Objectives of the Bill:

- Ensure an open and safe Internet to ensure user's rights and reduce risks for them online.
- Accelerate the growth of technology innovation.
- 'Safe Harbour' provision to be re-visited.

Safe Harbour

Safe Harbour as prescribed under Section 79 of the IT Act, 2000, is legal immunity that online intermediaries like social media platforms enjoy against content posted by their users on the platforms. This provision has enabled the high growth of social media platforms in India.



## 46. E-Rupee yet to take off

**Subject : Economy**

### **Section: Monetary Policy**

What is E-Rupee (e-Re) is the central bank digital currency (CBDC) launched by the RBI. While based on block-chain technology, it is **not a cryptocurrency**.

- The term central bank digital currency (CBDC) refers to the virtual form of a fiat currency.
- A CBDC is an electronic record or digital token of a country's official currency.
- As such, it is issued and regulated by the nation's monetary authority or central bank. As such, they are backed by the full faith and credit of the issuing government.
- CBDCs can simplify the implementation of **monetary and fiscal policy** and **promote financial inclusion** in an economy by bringing the unbanked into the financial system.
- Because they are a **centralized form of currency**, they may erode **the privacy of citizens**.
- Although they aren't formally being used, many countries are exploring the introduction and use of CBDCs in their economy.

### **Key Points:**

- Pilot was launched in 4 cities—Mumbai, New Delhi, Bengaluru, and Bhubaneswar.
- Presently 4 banks – SBI, ICICI Bank, IDFC First Bank and YES Bank – are involved in the first phase of the pilot
- Four more banks – HDFC Bank, Bank of Baroda, Union Bank and Kotak Mahindra Bank will subsequently be added to the plan, which would cover 13 cities in a phased manner.
- At present only Rs. 5.7 crore is in circulation as CBDC-Retail and Rs. 10.69 crore for CBDC-Wholesale
- CBDC-Retail can only be used for peer-to-peer account transfer, but CBDC -Wholesale is more versatile and can be used for inter-bank transfers as well as international transfers.

### **Aim:**

- It is Government's answer to cryptocurrency, which has been denied a legal status in India so far.
- e-Re is also targeted at those who don't have a bank account, but can use digital currencies similar to a pre-paid mobile recharge card.
- e-RUPI is trying to attain a leak-proof way of passing on government subsidies.
- Other objectives are to promoting financial inclusion, enhancing payment system efficiency, competition, security, resiliency, and cross-border payments

### **Features:**

- Available in exact denominations of physical cash
- The E-Re will not earn interest when parked in the e-wallet.
- No intermediary, direct peer-to-peer transfer.
- Instant completion of transaction, no back-end settlement needed.

### **How different from UPI:**

- **UPI** requires a **request** from your **bank to transfer an amount** from your account. For E-Re one can simply transfer digital money from one wallet to another.
- **UPI** works on a **settlement basis** between two banks, and it takes about a day for inter-bank settlements to conclude. Thus there is a **settlement risk** in UPI, since there is an intermediary involved. But in **e-Re**, there is **no settlement risk**, since it is issued by the RBI and could also be much faster.
- As **UPI** is a bank-to-bank payment mode, there is a **transaction or audit trail it leaves**, which **e-Re won't** because it is wallet-to-wallet transfer. RBI is likely to allow **anonymity** in e-Re transactions, at least in the small-ticket ones.
- Customers are unlikely to be charged anything for using e-Re since usage of cash does not involve any charges. UPI is free now, but could become chargeable in future.
- Multiple factors that contributed to the growth of UPI such as the interoperability of QR code, zero charge, and first mover advantage may limit adoption of E-Re by retail users.

## 47. Light weight and portable Payment and Settlement System (LPSS)

**Subject :Economy**

### **Section: Monetary Policy**

The LPSS is being **proposed by RBI**, is a system that will be **independent of conventional technologies** and can be operated from anywhere with minimum staff. The aim is to ensure following:

- Ensure near zero downtime of payment and settlement system
- Enhance the liquidity available in the economy.
- Essential payment services work even in extreme situations or catastrophic events.
- Achieve a '**bunker equivalent**' in payment system and enhance public confidence in digital payments and financial market infrastructure even during **extreme conditions**.

#### Features of a LPSS:

- Will operate of minimalistic hardware and software, to be made available on a need basis only with ability to process **transactions critical** to ensure **economic stability**.
- Unlike conventional systems like UPI, NEFT, RTGS it will not be dependent on complicated IT infrastructure.

### 48. Payment Infrastructure Development Fund (PIDF) scheme

**Subject : Economy**

**Section: Monetary Policy**

#### Concept:

- It was set up by the Reserve Bank of India to facilitate the development of payment acceptance infrastructure in **tier-3 to tier-6 cities** and **north-eastern states**.
- Was launched in Jan, 2021 in consultation with **major authorized card networks**, to facilitate the development of payment acceptance infrastructure
- It aims to provide financial assistance to eligible entities for setting up, extending and modernizing payment infrastructure across the country.
- The scheme is expected to benefit both consumers and businesses by making digital payments more accessible and convenient.

#### Operationalization of the scheme:

- RBI, with assistance from card networks, the Indian Banks' Association (IBA), and the Payments Council of India (PCI), monitored the implementation of these targets.
- RBI is responsible for operationalizing the scheme, with the Chairman of the Payments Council of India at the helm.
- Subsidy of between 30% and 50% for physical Point-of-Sale (PoS) devices and 50% to 75% for digital PoS devices.

### 49. Stress Testing of Financial Institutions

**Subject :Economy**

**Section: Monetary Policy**

Stress testing is an analytical technique to show how a financial services company or bank will be affected by certain financial events or situations. In other words, it shows what can happen and how well prepared institutions are when certain stressors are introduced.

#### Key points:

- Stress testing is generally a **computer-simulated technique** to analyze how banks and investment portfolios perform in case of adverse economic scenarios.
- **Banks** use it to measure **investment risk and the adequacy of assets** and help evaluate **internal processes and controls**.
- **Portfolio managers** use internal stress-testing programs to evaluate how well the assets they manage might weather certain market occurrences and external events.
- **Retirement and insurance portfolios** are also frequently stress-tested to ensure that cash flow, payout levels, and other measures are well aligned.
- Regulators carry out stress tests to ensure that the capital holdings and other assets of such institutions are adequate. This is called '**regulatory stress testing**'.
- **BASEL III** also requires the administration of stress tests by Banks for various crisis scenarios.

- RBI conducts **bi-annual stress tests** for RBI's **Financial Stability Report (FSR)**. RBI had found Banks and NBFCs adequately capitalized for any economic stresses but found Urban Cooperative Banks (UCB) vulnerable (2022).
- **Monte Carlo simulation** is one of the most widely known. This type of stress testing can be used for modeling **probabilities of various outcomes** given the various economic variables, such as inflation, forex rate, interest rates, unemployment rates etc.
- Other types of stress tests are: **Historical** (response to similar events as in past is evaluated) and **Hypothetical stress tests** (response to various possible events/shocks is examined).

## 50. Hardening interest rates, geopolitical risks impacting FDI inflows

### **Subject : Economy**

#### **Concept :**

- Hardening interest rates globally and worsening geo-political situation have impacted the foreign direct investment (FDI) inflows into India in 2022-23, a top government official said.
- Secretary of the Department for Promotion of Industry and Internal Trade (DPIIT) Rajesh Kumar Singh said that the department would analyse the reasons for the contraction in FDI in five important sectors like computer hardware and software; construction, education, automobiles and metallurgical industries.
- These five sectors had a share of USD 30 billion in India's total FDI in 2021-22 and in the last fiscal year, overseas inflows have almost halved.

#### **Various Investment Models**

##### **Based on Project Grouping**

- **Public-Private Partnership (PPP) :**
  - A public-private partnership (PPP, 3P, or P3) is a cooperative arrangement between two or more public and private sectors, typically of a long-term nature.
  - In other words, it involves government(s) and business(es) that work together to complete a project .
  - The public and private stakeholders sign up to jointly develop, finance, execute and operate a (mostly) infrastructure project, and thus an entity called concessionaire is created (sometimes also called an SPV – special purpose vehicle).
  - The contract demarcates the responsibilities of the two partners, and in most cases, the public partner assumes the preparatory works like land acquisition, statutory approvals, political resolution of issues, etc., in addition to overall tracking of the work to be done by the private partner.
  - The public partner may or may not be bringing in any hard equity other than land, etc.
  - The private agency invests money, obtains financing, executes the project and runs the assets thus created for a pre-defined period of time in order to realize a return on its financial investments.
- **Engineering, Procurement and Construction (EPC) Model:**
  - Under this model, the cost is completely borne by the government.
  - Government invites bids for engineering knowledge from the private players.
  - Procurement of raw material and construction costs are met by the government.
  - The private sector's participation is minimum and is limited to the provision of engineering expertise.
  - A difficulty of the model is the high financial burden for the government.
  - EPC Contractor (private entity) is made responsible for all the activities from design, procurement, construction, to commissioning and handover of the project to the Government.
  - This is a PPP model for the development of infrastructure projects especially highways.
- **Engineering, Procurement and Construction Management (EPCM) :**
  - Simply put, EPCM is a way of working on an engineering project which lets the project owner (say Government) stay in complete control of their project while engineering consultants (Private entities) manage the process from start to finish.
  - This means the private entities take care of all the stages of engineering: including planning, complex engineering requirements, co-ordinating all contractors and vendors etc. on the client's behalf and providing a single point of contact.
- **EPC VS EPCM**
  - EPC stands for Engineering, Procurement and Construction... so the crucially missing element is the "M" for "Management". Simply put, this is because EPC is not a service in the same way that EPCM is.
  - So this means with an EPC contract, the private entity will completely handle the Government's project from start to finish, however, the Government effectively relinquishes control of the project from the

moment the contract is signed. So the private entities then have complete ownership of the project until project completion, and they make all the decisions, with no involvement of the Government..

- But in EPCM contractors keep in touch and update the Govt. regarding the progress of commissioning of the project.
- **Engineering, Procurement, Construction and Installation (EPCI):**
  - This terminology is used for Off-Shore setups/Constructions.
  - In an EPCI contract, the contractor will design the structure/equipments, procure the required materials for its construction, will provide the necessary transportation of the structure and sets it up at an off-shore site.
  - The points and terminologies are much similar to an EPC contract.
- **LSTK (Lump sum Turnkey) or Turnkey Project :**
  - One of the special modes of carrying out international business is a turnkey project.
  - The turnkey projects meaning, a contract under which a firm agrees to fully design, construct and equip a manufacturing/ business/ service facility and turn the project over to the purchaser when it is ready for operation for remuneration.
  - The term turn-key project (Turn-key delivery) describes a project (or the delivery of such) in which the supplier or provider is responsible to the client for the entire result of the project and presents it to the client completely finished and ready to use.

#### Based on Project Classification

- **Build Operate and Transfer (BOT) Model:**
  - The private partner is responsible to design, build, operate (during the contracted period) and transfer back the facility to the public sector.
  - The private sector partner is expected to bring the finance for the project and take the responsibility to construct and maintain it.
  - In return, the public sector will allow it to collect revenue from the users.
  - The national highway projects contracted out by NHAI under PPP mode is an example.
- **LOT (Lease, Operate and Transfer) :**
  - Under this type of PPPs, a facility which already exists and is under operation, is entrusted to the private sector partner for efficient operation, subject to the terms and conditions decided by mutual agreement.
  - The contract will be for a given but sufficiently long period and the asset will be transferred back to the government at the end of the contract.
  - Leasing a school building or a hospital to the private sector along with the staff and all facilities by entrusting the management and control, subject to pre-determined conditions could come under this category.
- **BOOT project :**
  - This is a variation of the BOT model, except that the ownership of the newly built facility will rest with the private party during the period of contract.
  - This will result in the transfer of most of the risks related to planning, design, construction and operation of the project to the private partner.
  - The public sector partner will however contract to 'purchase' the goods and services produced by the project on mutually agreed terms and conditions.
  - In the latter case (BOOT), however, the facility / project built under PPP will be transferred back to the government department or agency, after the private partner recovers its investment and reasonable return agreed to as per the contract.
- **Design, Build, Finance and Operate (DBFO) or Design, Build, Finance, Operate and Maintain (DBFOM) :**
  - The private party assumes the entire responsibility for the design, construct, finance, and operate or operate and maintain the project for the period of concession.
  - These are also referred to as "Concessions".
  - The private participant to the project will recover its investment and return on investments (ROI) through the concessions granted or through annuity payments etc.
  - The public sector may provide guarantees to financing agencies, help with the acquisition of land and assist to obtain statutory and environmental clearances and approvals and also assure a reasonable return as per established norms or industry practice etc., throughout the period of concession.
- **Hybrid Annuity Model (HAM):**

- In financial terminology hybrid annuity means that the government makes payment in a fixed amount for a considerable period and then in a variable amount in the remaining period.
- This hybrid type of payment method is called HAM in the technical parlance.
- Hybrid Annuity Model (HAM) has been introduced by the Government to revive PPP (Public Private Partnership) in highway construction in India.
- Launch of the new model is due to many problems encountered as associated with the existing ones.
- Large number of stalled projects are blocking infrastructure projects and at the same time adding to Non-Performing Assets (NPAs) of the banking system.

How I predicted more than 60 questions in Prelims 2023: [How I Predicted UPSC CSE PRELIMS 2023 Paper - Optimize IAS](#)

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Environment

### 1. Stray Dogs and Poor Waste Management

**Subject :Environment**

#### **Section Monetary policy**

**Context:** Frequent reports of dogs chasing people down the road, attacking and even “mauling” people to death have made the management of stray dogs an administrative and legal issue. But what also determines how frequently, and where, these **attacks happen is how efficiently a city’s sanitation and waste disposal facilities operate, experts say.**

#### **What do dog bites have to do with poor waste management?**

- The “carrying capacity” — the ability of a city to support a species — is determined by the availability of food and shelter. Free-ranging dogs, in the absence of these facilities, **are scavengers that forage around for food**, eventually gravitating towards exposed garbage dumping sites.
- Dogs thus congregate around urban dumps, such as landfills or garbage dumps, due to feeding opportunities.
- A population boom in Indian cities has contributed to a staggering rise in solid waste. Indian cities generate **more than 1,50,000 metric tonnes of urban solid waste every day**
- **United Nations Environment Program report**, an estimated **931 million tonnes of food** available to consumers ended up in households, restaurants, vendors and other food service retailers’ bins in 2019. **Indian homes on average also generated 50 kg of food waste per person**, the report said.
- This food often serves as a source of food for hunger-stricken, free-roaming dogs that move towards densely-populated areas in cities, such as urban slums which are usually located next to garbage dumping sites and landfills.

#### **What role do urbanisation and urban planning play?**

- Cities have **witnessed a sharp increase in the stray dog population**, which as per the official 2019 livestock census stood at **5 crore**. However, **independent estimates peg the number to be around 6.2 crore**.
- The **number of dog bites has simultaneously doubled** between 2012 and 2020 (researchers however note there is a paucity of data on dog bite deaths due to neglect in the management of rabies).
- India also **shoulders the highest rabies burden** in the world, accounting for a third of global deaths caused due to the disease.
- In 2015, a study conducted in 10 Indian metro cities — including Delhi, Mumbai, Chennai, and Bengaluru — found a **strong link between human population, the amount of municipal and food waste generated, and the number of stray dogs in the cities**.
- Experts agree there may be a **correlation between urbanisation and solid waste production**, made visible **due to the mismanagement of waste disposal**. Tepid animal birth control programmes and insufficient rescue centres, in conjunction with poor waste management, result in a proliferation of street animals in India, research argues.



- **Urban local bodies are struggling to implement and sustain rules under the Solid Waste Management Rules 2016**, such as the door-to-door collection of segregated waste, studies show.
- All the waste collected should be transported to designated landfill sites, but estimates by the Ministry of Environment, Forest and Climate Change of India show that **only 75-80% of the total municipal waste is collected, and only 22-28% of it is processed**. The rest is dumped across cities, becoming food for stray dogs or clogging sewerage
- The **proximity of residential areas to dumping sites and the rise in dog attacks** speak to “core issues of **unplanned and unregulated urban development**, the lack of serviced affordable urban housing for all, lack of safe livelihood options and improper solid waste management”, researchers at the World Resource Institute (WRI) wrote in a blog.

#### **Animal Birth Control or ABC Rules:**

- First introduced in **2000** by **Ministry of Culture**.
- Recently replaced by the **ABC rules 2023**.
- The rules are issued under the **Prevention of cruelty to animal act, 1960**
- The **policy aims** to implement a **technique** called ‘**catch-neuter-vaccinate-release**’ to control populations of free-ranging dogs and cats.
- **Provisions:**
  - The Rules have been formulated in accordance with the guidelines provided by the Hon’ble Supreme Court related to **Animal Welfare Board of India and People for Elimination of Stray Troubles**.
    - The **Supreme Court** has specifically mentioned in various orders that **relocation of dogs cannot be permitted**.
  - The Rules aim to provide guidelines for the **sterilisation and immunisation of stray dogs** through **Animal Birth Control (ABC) programmes**.
    - The responsibility of carrying out ABC programmes lies with the respective **local bodies, municipalities, municipal corporations, and panchayats**.
    - The Municipal Corporations are required to implement the **ABC and Anti Rabies Program jointly**.
  - It provides guidelines on **how to deal with human and stray dog conflicts** without relocating the dogs in an area.
  - It also **emphasises addressing the cruelty involved** in carrying out ABC programmes, **ensuring animal welfare**.

#### **Drawbacks of the rule:**

- No benchmark has been set for the number of dogs to be sterilized.
- No proper population estimation of stray dogs by municipalities.
- **ABC Rules ban the euthanasia of rabid animals**, making **India the only country** in the world to follow such a cruel practice. The rules require rabid dogs to “**die a natural death**”.

#### **Rabies**

- **Rabies is a vaccine-preventable, zoonotic, viral disease** affecting the central nervous system.
  - It is present on all **continents except Antarctica**, with over 95% of human deaths occurring in Asia and Africa.
- **Cause:**



- It is caused by a **Ribonucleic Acid (RNA) virus** that is present in the saliva of a rabid animal (dog, cat, monkey, etc).
- It is invariably transmitted following a bite of an infected animal that leads to **deposition of the saliva and the virus in the wound.**
  - **According to WHO,** Dogs are the main source of human rabies deaths, contributing up to **99% of all rabies transmissions to humans.**
- **Status in India:**
- **India is endemic for rabies, and accounts for 36% of the world's rabies deaths.**
- According to WHO, about **30-60% of reported rabies cases and deaths in India occur in children under the age of 15 years** as bites that occur in children often go unrecognised and unreported.

## 2. Shrinking glaciers and effective policy-level communication

### **Subject: Environment**

**Context:** Climate change impacts on Indus river basin glaciers

#### More on the News:

- Glaciologist says communicating about the **uncertainties attached to glaciers with policymakers** is one of the most challenging tasks.
- The remote sensing models developed helps **understand the Himalayan cryosphere and also estimate glacier mass balance.**
- Glaciers in the **western Himalayas** are “**actively under the degradation phase,**” as per one of the studies.
  - **Glaciers in the Alaknanda and Bhagirathi river** basins in the Western Himalayas where the river Ganga originates. They find that **around 96% of glaciers have continuously lost water** between 2001 and 2013. Their findings strengthen the evidence that Himalayan glaciers are “actively under the degradation phase
- Glaciologist talks about his experiences while studying glaciers, the **state of glaciology in India and the need for revised water sharing practices between India and Pakistan** with the backdrop of melting glaciers in the eastern Himalayas.
  - Expert says the findings show the **proportion of water distributed between India and Pakistan will be significantly affected by the middle of the century due to the non-uniform impacts of global warming** in the region.

## 3. Mutualisms

### **Subject: Environment**

#### Mutualism, Cooperation and Symbiosis:

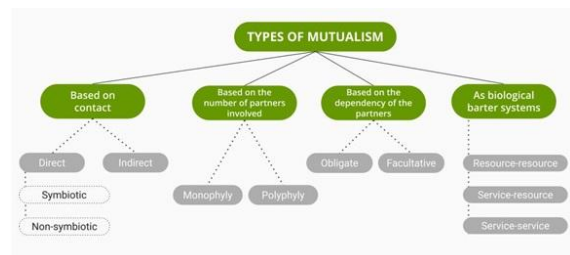
- Cooperation is a **broad label for beneficial interactions that can exist between two or more individuals of the same species or of different species.** Therefore, mutualism, which **refers to the positive interactions between creatures of different species,** is a subset of the interactions that fall under the ambit of cooperation.
- Symbiosis translates roughly into ‘**life companions**’ and **refers to organisms that live in close contact with each other.** Symbiotic relationship can either be **parasitic** (where **one organism benefits from the association and the other is harmed**), **commensal** (where one benefits, but the other gains no benefit nor is it harmed), or **mutualistic** (where **both organisms benefit** from their interactions).

#### Examples:

- **Plants rely on pollinators** to ferry pollen between flowers for reproduction. Pollinators receive food (either as nectar or the pollen itself) as a reward for this service.
- Mutualisms are those between **plants and nitrogen-fixing bacteria** (where plants provide food and shelter to bacteria that convert atmospheric nitrogen into minerals that plants can absorb)
- **Plants and fungi called mycorrhizae** (where plants provide food and shelter to fungi that help the plants to absorb micronutrients like phosphorous and iron from soil).

- **Humans and some gut bacteria** such as specific strains of **Escherichia coli** or **E. coli** have mutualistic relationships where the **human provides food and shelter to the bacteria**, which provide their human hosts with **vitamin K and some essential nutrients**.
- **Ants and termites with fungi**, where the **ants/termites literally cultivate fungi by providing specific fungi with food** (usually cellulose from plant material like wood and leaves) to grow on and **protect the fungi by weeding out or killing off competing fungi**. The fungi, in turn, digest the cellulose and convert it into a form that the ants can eat.
- Between **ants and aphids**, where ants protect aphids from predators and the aphids reward the ants with drops of sweet sugary liquid called honeydew.
- Mutualisms between **corals and photosynthetic organisms called zooxanthellae**. The corals provide zooxanthellae with shelter and minerals, while the zooxanthellae provide the corals with oxygen, glucose, glycerol, and amino acids, which are products of photosynthesis.

#### Types of Mutualism:



#### 4. Tropical 'runaway greenhouse' provides insight to Venus

**Subject :Environment**

**Section: Climate change**

#### Runaway Greenhouse:

- A region in the Western Tropical Pacific Ocean may help scientists **understand how Venus lost all of its water and became a 900-degree inferno**. The study of this local phenomenon by NASA scientists also should help researchers understand what conditions on Earth might lead to a similar fate here.
- The phenomenon, called the **'runaway greenhouse' effect, occurs when a planet absorbs more energy from the sun than it can radiate back to space**.
- Under these circumstances, the **hotter the surface temperature gets, the faster it warms up**. Scientists detect the signature of a runaway greenhouse when planetary heat loss begins to drop as surface temperature rises.
- Only one area on Earth – the **western Pacific 'warm pool' just northeast of Australia** – exhibits this signature. Because the **warm pool covers only a small fraction of the Earth's surface**, the Earth as a whole never actually 'runs away.' However, scientists believe **Venus did experience a global runaway greenhouse effect about 3 billion to 4 billion years ago**.
- Scientist used atmospheric conditions above the Pacific Ocean, including data recorded by NASA's Earth Observing System of satellites, to **create a computer model of the runaway greenhouse effect**. They **determined that water vapor high in the atmosphere produced the local signature of a runaway greenhouse**.
- **At sea surface temperatures above 80 F (27 C), evaporation loads the atmosphere with a critical amount of water vapor**, one of the most efficient greenhouse gases. Water vapor **allows solar radiation from the sun to pass through**, but it **absorbs a large portion of the infrared radiation coming from the Earth**. If enough water vapor enters the troposphere, the weather layer of the atmosphere, it **will trap thermal energy coming from the Earth, increasing the sea surface temperature even further**.
- The effect should **result in a chain reaction loop** where sea surface temperature increases, **leading to increased atmospheric water vapor** that leads to more trapped thermal energy. This would **cause the temperature increase to 'run away,'** causing more and more water loss through evaporation from the ocean.
- Luckily for Earth, **sea surface temperatures never reach more than about 87 F (30.5 C)**, and so the **runaway phenomenon does not occur**.
- What is limiting this effect over the warm pool of the Pacific?. **Cloud cover may affect how much energy reaches or escapes Earth**, or that the ocean and atmosphere may transport trapped energy away from the local hotspot.

- **Water vapor above 5 kilometers (3 miles) altitude in the atmosphere contributes significantly to the runaway greenhouse signature.** Scientist found that **at 9 kilometers (5.6 miles) above the Pacific warm pool, the relative humidity in the atmosphere can be greater than 70 percent** – more than three times the normal range.
- **In nearby regions of the Pacific where the sea surface temperature is just a few degrees cooler, the atmospheric relative humidity is only 20 percent.** These **drier regions of the neighboring atmosphere may contribute to stabilizing the local runaway greenhouse effect.**
- The model may help researchers uncover why Venus experienced a complete runaway greenhouse and lost its water over a period of several hundred million to a billion years. The research may also help determine which planets in the so-called ‘habitable zone’ of a solar system might lack water, an essential ingredient for life as we know it.

## 5. Tipping Point

**Subject :Environment**

**Section: Climate change**

### Tipping Point

- The **sixth report from the United Nations Intergovernmental Panel on Climate Change (IPCC)**, released in 2021, defines a **tipping point** as a “critical threshold beyond which a system reorganizes, often abruptly and/or irreversibly”.
- It can be **brought about by a small disturbance causing a disproportionately large change in the system.** It can also be associated with **self-reinforcing feedbacks**, which could lead to **changes in the climate system irreversible** on a human timescale.
- For any particular climate component, the shift from one state to a new stable state may take many decades or centuries.
- A danger is that if the tipping point in one system is crossed, this could cause a cascade of other tipping points, leading to severe, potentially catastrophic, impacts.
- In ecosystems and in social systems, a **tipping point can trigger a regime shift**, a major systems reorganization into a new stable state. Such regime shifts need not be harmful.
- In the context of the climate crisis, the **tipping point metaphor is sometimes used in a positive sense**, such as to **refer to shifts in public opinion in favour of action to mitigate climate change**, or the **potential for minor policy changes** to rapidly accelerate the transition to a green economy.

## 6. Black Tiger

**Subject :Environment**

**Section: Species in news**

**Context:** Death of rare black tiger in Odisha’s Similipal Tiger Reserve will have big impact on population.

### More on the News:

- The **death of a rare black tiger** reported **after three decades in the Similipal Tiger Reserve** in Odisha’s Mayurbhanj district could have a big impact on the population of the animals.
- The carcass of the melanistic male big cat was found in the core areas of the reserve. Forest officials said it died due to a territorial fight with another male.

### Black Tiger:

- They are a **rare colour variant** of the tiger and are **not a distinct species or geographic subspecies**.
- The **abnormally dark or black coat** in such tigers is **termed pseudomelanistic or false coloured**.
- The only other black tigers outside of **Similipal in India** exist at the **Nandankanan Zoological Park in Bhubaneswar, Ranchi Zoo and Chennai’s Arignar Anna Zoological Park**.
- **Similipal has the world’s highest rate of black tiger sightings** in the world. The reserve **had last reported eight tigers**, according to the Tiger Status Report 2018.
- The tigers in the Similipal Tiger Reserve are an **isolated population in eastern India and gene flow between them and other tiger populations is very restricted**.

### Similipal Tiger Reserve

- Similipal National Park is a national park and a tiger reserve in the **Mayurbhanj district** in the Indian state of Odisha covering 2,750 km<sup>2</sup> (1,060 sq mi).

- It is **part of the Mayurbhanj Elephant Reserve**, which includes three protected areas — Similipal Tiger Reserve, Hadgarh Wildlife Sanctuary and Kuldiha Wildlife Sanctuary.
- Similipal National Park **derives its name from the abundance of red silk cotton trees** growing in the area.
- This **protected area is part of the UNESCO World Network of Biosphere Reserves** since 2009.
- Similipal Elephant Reserve is an ecosystem complete with forest vegetation (mainly sal trees), fauna and the **adjoining Ho / Santhal tribal settlements**.
- Two tribes, the **Erengakharias and the Mankirdias**, inhabit the reserve's forests and practise traditional agricultural activities (the collection of seeds and timber).

## 7. Birth rate of large, migratory birds declined due to climate change

**Subject :Environment**

**Section: Climate change**

**Context:** Study shows declines in offspring production were observed in relatively large birds & migratory birds.

**More on the News:**

- Climate change has **reduced the overall birth rate of bird species** across the world, a new study has found.
- Researchers analysed 201 wild bird populations from all continents between 1970 and 2019 and found birth rate has declined during recent decades, with great variation among species and populations.
- **Declines in offspring production were observed in relatively large birds and migratory birds**, whereas species whose production increased were small-bodied and sedentary.
- The research suggested that **larger species were more vulnerable to declines in offspring production**. Body mass exceeding one kilogram for sedentary species and 50 grams for migratory species is associated with adverse trends in offspring production.
- **Larger-bodied species may respond slower to changing environmental and climatic conditions due to their lower fecundity (ability to produce young) and extended maturation period.**
- Thus, climate variability is an important factor when **coupled with migratory habits and the number of broods raised in the breeding season**.
- The researchers found that **non-migratory species, especially smaller ones, can usually adjust to changes in local conditions and may benefit from climate warming**. While migratory species, except the smallest, may suffer.
- The study aimed to look at the temporal changes in annual offspring production by female breeders in relation to changes in local temperatures and species' life history traits.

## 8. International Leopard Day 2023

**Subject :Environment**

**Section: Species in news**

**Context:** A **new portal** dedicated to leopards (*Panthera pardus*) was launched by the Cape Leopard Trust (CLT), an active predator conservation working group, on International Leopard Day (May 3, 2023) to promote and celebrate leopards worldwide.

**More on the News:**

- The **launch of the website org** follows the Global Leopard Conference held from March 13-19 by CLT, global wild cat organization Panthera and some other organizations.
- A statement by CLT noted that “despite being a well-known and charismatic species, the **conference presentations and discussion groups overwhelmingly indicated that leopards are still greatly in need of awareness raising, support and investment** — especially considering their ‘Vulnerable’ status as listed by the International Union for Conservation of Nature”.
- In comparison to other large carnivores, leopards are quite adaptable with respect to their habitat needs and food requirements, being found in agro-pastoral landscapes, plantations and near human habitation (both rural and urban).
- Leopards are a species that have never been as well acknowledged and studied as, say, tigers. It is **good that this website has been created. It means there will be more knowledge out there in the public domain.**

## Indian Leopard

- The Indian leopard is a leopard subspecies **widely distributed on the Indian subcontinent**.
- It is **one of the big cats** occurring on the Indian subcontinent, apart from the Asiatic lion, Bengal tiger, snow leopard and clouded leopard.

- Habitat – India, Nepal, Bhutan and parts of Pakistan.
- Leopard is a middle-sized wild cat has a **slim and long body with short, sturdy legs and a long tail**, helping the animal to keep balance when in the trees.
- Leopards are generally asocial animals, **living solitarily** and avoiding other leopards.
- The leopard is distinguished by its **well-camouflaged fur, opportunistic hunting behavior, broad diet, strength, and its ability to adapt** to a variety of habitats ranging from rainforest to steppe, including arid and montane areas.
- **Conservation Status:**
  - It is listed as **Vulnerable** on the IUCN Red List.
  - Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES): **Appendix I**
  - Wildlife Protection Act 1972: **Schedule 1**

## 9. International Civil Aviation Organisations (ICAO)

### **Subject : Environment**

#### **Section: International conventions**

##### **Context:**

The Ministry of Civil Aviation (MoCA) has announced that India will start participating in the **International Civil Aviation Organisation's (ICAO) Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA)** and the Long-Term Aspirational Goals (LTAG) from 2027.

##### **CORSIA:**

- CORSIA is the **first global market-based measure** for any sector and represents a cooperative approach that moves away from a “patchwork” of national or regional regulatory initiatives. It offers a harmonized way to reduce emissions from international aviation, minimizing market distortion, while respecting the special circumstances and respective capabilities of ICAO Member States.
- CORSIA complements the other elements of the basket of measures by offsetting the amount of CO<sub>2</sub> emissions that cannot be reduced through the use of technological improvements, operational improvements, and sustainable aviation fuels with emissions units from the carbon market.
- CORSIA is **applicable only to flights originating from one country to another.**

##### **LTAG:**

- 41<sup>st</sup> ICAO Assembly **adopted LTAG for international aviation of net-zero carbon emissions by 2050** in support of the UNFCCC Paris Agreement's temperature goal.
- The LTAG does not attribute specific obligations or commitments in the form of emissions reduction goals to individual States. Instead, it recognizes each State's special circumstances and respective capabilities e.g., the level of development, maturity of aviation markets.

##### **International Civil Aviation Organization (ICAO):**

- It is a **specialised agency of the United Nations** and its primary function is to **coordinate the principles and techniques of international air navigation.**
- The organisation is also responsible for promoting the **planning and development of international air transport.**
- ICAO's mission is to ensure the **safe and orderly development of the international aviation industry.**
- The organisation works with its member states to **develop and implement policies and regulations related to air navigation and air transport.**
- ICAO also provides technical assistance and training to help its member states meet international aviation standards and regulation

## 10. Petersberg Climate Dialogue

### **Subject : Environment**

#### **Section: Climate Change**

**Context:** The discussions at the event veered around global renewables target, climate finance and Global Stocktake.

##### **Key takeaways from the Petersberg Climate Dialogue:**

- Petersberg Dialogue on Climate Change was **held in Berlin** from May 2-3, 2023. It was **hosted by Germany and the United Arab Emirates**, which is **hosting the 28th Conference of Parties (COP28) to the United Nations Framework Convention on Climate Change.**



- **Ministers from 40 countries** attended the conference to discuss the way forward towards COP28.
- **Acceleration Agenda:**
  - The goal of the Acceleration Agenda is to hasten countries' **Net Zero targets by requiring the phasing out of coal in OECD nations by 2030 and by 2040 in all other countries**, as well as reaching Net Zero electricity production and decarbonizing major industries.
- **Focused on phasing out fossil fuel emissions**, while phasing up viable, affordable zero-carbon alternatives
- **Global Stock-take:**
  - 2023 is the year for the Global Stock-take, which is a **periodic review of global climate action that aims to assess whether current efforts will enable us to reach the objectives set out in the Paris Agreement**. The report has been underway for the past two years and is set to be released in September of 2023.
- **Climate Finance:**
  - **Developed countries are on a good track to deliver the \$100 billion per year they had promised to mobilize by 2020 during the COP15 in 2009. However, providing the pledged \$100 billion by 2023 may not be enough**, as climate finance requirements for emerging markets alone are estimated at \$1 trillion per year by 2030. This indicates that **developed countries have mobilized an amount that is more than ten times smaller than the climate finance needs**, even after committing to the \$100 billion goal for 14 years.

#### **Petersberg Climate Dialogue:**

- Petersberg Climate Dialogue is an **annual high-level political dialogue on climate change, co-hosted by Germany and a partner country**.
- The aim of this dialogue is to **promote international climate cooperation and advance discussions** on the implementation of the Paris Agreement.
- The Petersberg Climate Dialogue **was first held in 2010 in the Petersberg Palace near Bonn, Germany**. It was initiated by the German government **after the disappointing outcome of the 2009 United Nations Climate Change Conference in Copenhagen**.
- The dialogue is an **informal meeting of ministers and high-level representatives** from around 35 countries, including the major emitters of greenhouse gases. The participants discuss key issues related to climate change and **share their perspectives on the implementation of the Paris Agreement**.
- The dialogue is **not a negotiation platform**, but rather an **opportunity for participants to exchange ideas and best practices**, and to build trust and mutual understanding.
- The Petersberg Climate Dialogue is **held annually, usually in May**, and is seen as an important **stepping stone towards the United Nations Climate Change Conference (COP)**, which takes place later in the year. The outcomes of the dialogue are fed into the negotiations at COP.

#### **11. Health Day at upcoming UN climate conference**

**Subject :Environment**

**Section: Climate change**

**Context:** Health Day at upcoming UN climate conference — a first in COP history

#### **More on the News:**

- Finally heeding to the many versions of the 'climate change crisis is a public health crisis' argument made by domain experts, the upcoming 28th Conference of Parties (COP28) to the United Nations Framework Convention on Climate Change will assess health issues in great detail.
- This reverses a historical trend of **health being absent from COP discussions**, despite roughly 189 million people in developing countries being affected by extreme weather events annually since 1991.
- COP28 will be the **first COP to dedicate a day to health** and the **first to host a health and climate ministerial**. And need to **broaden our definition of adaptation to enable global climate resilience, transform food systems and enhance forestry land use and water management**.
- The **COVID-19 pandemic highlighted fissures in the health systems** across the world, which will only widen as the climate change crisis worsens. A warming world will add to the existing high disease burden. This is because **increased disasters like heatwaves, floods and droughts will lead to more illnesses** while an **increase in temperature will allow for vector-borne diseases** to survive at higher latitudes and thereby impact a greater population.

- Health received some attention at COP27 held in Egypt last year when conference resolutions referred to the need for governments' climate action to respect, promote, and consider their respective obligations on human rights, including the right to highest attainable standard of physical and mental health.
- In 2021, the WHO joined hands with the United Kingdom COP26 presidency and established the Alliance for Transformative Action on Climate and Health, which had 60 countries as signatories.

#### Alliance for Transformative Action on Climate and Health

- Alliance for Transformative Action on Climate and Health (ATACH) works to realize the ambition set at COP26 to build climate resilient and sustainable health systems, using the collective power of WHO Member States ("Member States") and other stakeholders to drive this agenda forward at pace and scale; and promote the integration of climate change and health nexus into respective national, regional, and global plans.
- Four thematic working groups will work to address common issues:
  - Financing the Health Commitments on Climate Resilient and Sustainable Low Carbon Health Systems.
  - Climate Resilient Health Systems.
  - Low Carbon Sustainable Health Systems.
  - Supply chains.

#### Functions of the ATACH

- **Delivering international shift on priority issues:** This function focuses on areas where a global shift can be delivered through the collective power of Member States and other stakeholders, as appropriate. It reflects collective interest of the Alliance as well as context specific themes which may be more applicable to smaller groupings of Member States.
- **Monitoring:** Support WHO, in its efforts to collect data on country level progress against the commitments made.
- **Quality Assurance:** Support WHO in developing quality assurance mechanisms designed to help ensure that assessments, plans, and implementation are of the quality required to deliver on commitments made thereby facilitating a common understanding of such commitments and measures of progress. The core aim is to help identify where support is required and to identify best practice.
- **Financing:** This focuses on identifying financing needs, and support Member State access to finance, including climate finance, in a timely and sustainable way. This information also feeds into the monitoring function, tracking the performance of both domestic as well as donor/ development finance agencies in making funding available to meet Member State commitment needs.
- **Knowledge sharing and coordinating access to technical assistance:** This function provides a forum for Alliance Participants to share expertise, knowledge and experience on the assessment, planning implementation, financing, and monitoring of commitments. This supports exchange among Participants and access to information to support evidence based and cost-effective delivery of commitments.

#### 12. Credit Suisse-Ecuador deal for Galapagos conservation

**Subject: Environment**

**Section: Places in news**

**Concept:**

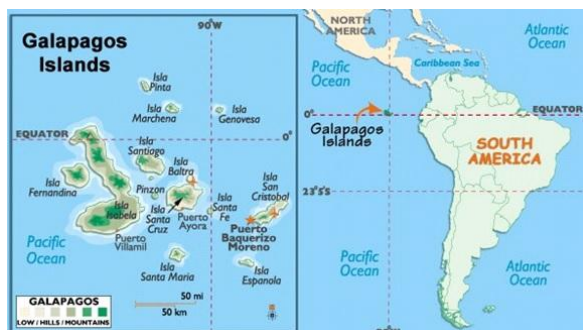
- Ecuador has committed to spending millions of dollars annually for 20 years to protect one of the world's most precious ecosystems, after the Swiss bank bought bonds at less than half of their original value.
- Effectively, Ecuador has now bought its own debt back at a knock-down price via a fresh loan from Credit Suisse.
- And in return, Ecuador's government had pledged to spend about \$18 million annually for two decades on conservation in the Galapagos Islands.
- The remote islands — home to some of the most unspoiled nature in the world — are a UNESCO world nature heritage site, and their animal life was crucial to Charles Darwin's research before publishing his theory of evolution.

#### **About Galapagos Islands**

- It is an archipelago of volcanic islands.
- It belongs to the Republic of Ecuador that lies 926 km to the east.
- The islands are located in the eastern Pacific Ocean, 973 km off the west coast of South America



- They are distributed on **each side of the equator in the Pacific Ocean**, surrounding the centre of the Western Hemisphere.
- The islands are located at the **Galapagos Triple Junction**. The Galapagos Triple Junction is a geological area in the eastern Pacific Ocean several hundred miles west of the Galapagos Islands **where three tectonic plates – the Cocos Plate, the Nazca Plate and the Pacific Plate – meet**.
- The archipelago is precisely **located on the Nazca Plate (a tectonic plate)**, which is moving east/southeast, diving under the South American Plate at a rate of about 2.5 inches (6.4 cm) per year.
- Mount Azul, at 5,541 feet is the highest point of the Galapagos Islands.
- The islands are well known for their **distinctive endemic species, including giant tortoises, finches, flightless cormorants, Galápagos lava lizards and marine iguanas, which evolved to adapt to islands' environments**.



### 13. Kerala seed farm declared as first carbon neutral farm

**Subject :Environment**

**Section: Climate change**

**Context:** Kerala Chief Minister declared a seed farm, **located in Aluva** here, as the first carbon neutral farm in the country.

**More on the News:**

- **A significant reduction in carbon emission** has helped the seed farm, under the Agricultural Department, achieve carbon neutral status.
- The **total amount of carbon emission from the farm**, located at Thuruthu in Aluva, in the last one year was 43 tons but its overall procurement was 213 ton.
- Compared to the emission rate, as many as 170 tons of more carbon have been procured at the farm, which helped it to be declared as the first carbon neutral seed farm in the country.
- The Kerala state will **introduce carbon-neutral farming methods in selected locations**, for which the government has allocated ₹6 crore in the 2022-23 Budget.
- In the **first phase, carbon-neutral farming will be implemented in 13 farms under the Agriculture department** and tribal areas, and steps are on to convert the State Seed Farm at Aluva a carbon-neutral farm.
- In the **second phase, model carbon-neutral farms will be developed in all the 140 Assembly constituencies**.

### Carbon Neutral Farming

- Carbon neutral farming refers to the **practice of agricultural methods that do not emit more carbon than they sequester** from the atmosphere.
- It involves **implementing practices that reduce greenhouse gas emissions** and promoting methods that increase carbon sequestration. Examples of carbon neutral farming practices **include reducing the use of fossil fuels, promoting the use of renewable energy sources, reducing tillage, and promoting cover crops**.
- **Improving soil health through integrated farming methods, rotation of crops**, adoption of fertigation, **precision farming methods**, changing the ways in which the soil is irrigated and **limiting the indiscriminate use of fertilizers** were important for **preventing soil degradation and thus reducing carbon footprint** in agriculture.

**Need for Carbon-neutral farming:**

- **Climate change mitigation:** Agriculture is one of the major contributors to greenhouse gas emissions, which are **the primary cause of climate change**. Carbon-neutral farming can help to mitigate these emissions by reducing the use of fossil fuels and sequestering carbon in the soil.
- **Soil health:** Carbon-neutral farming practices can improve soil health **by increasing the organic matter content in the soil**. This, in turn, improves soil structure, water-holding capacity, and nutrient availability.
- **Biodiversity:** Carbon-neutral farming practices can promote biodiversity **by providing habitat for wildlife and promoting the growth of native plant species**.
- **Food security:** Carbon-neutral farming practices can help to ensure food security by promoting sustainable agriculture and reducing the risk of crop failures due to climate change.
- **Economic benefits:** Carbon-neutral farming can provide economic benefits **by reducing input costs and increasing yields over the long term**. It can also create new income streams for farmers through carbon credit markets.

#### 14. System of Environmental-Economic Accounting

##### **Subject: Environment**

##### **Section: Climate change**

##### **System of Environmental-Economic Accounting:**

- System of Environmental-Economic Accounting (SEEA) framework has been **used to measure the links between environment, economic and societal well-being**.
- SEEA has two parts, the **central framework and ecosystem accounting**; the latter includes services provided by ecosystems, tracking changes in ecosystem assets and linking this to human activity.
- It contains the **internationally agreed standard** concepts, definitions, classifications, accounting rules and tables for producing internationally comparable statistics and accounts.
- The SEEA framework follows a **similar accounting structure as the System of National Accounts (SNA)**.
- The framework uses concepts, definitions and classifications consistent with the SNA in order to **facilitate the integration of environmental and economic statistics**.
- It is a **flexible system that can be adapted to countries' priorities and policy needs** while at the same time providing a common framework, concepts, terms and definitions.
- While these frameworks have been largely applied to land ecosystems, they are now increasingly being applied to marine ecosystems through ocean accounting.
- In fact, the **Ministry of Statistics and Programme Implementation (MoSPI)** which has so far been focusing on land accounts, **has called for expanding the coverage of the accounts to include ocean accounts** in its strategy for the next half decade.

##### **NCAVES (National Capital Accounting and Valuation of Ecosystem Services):**

- NCAVES (National Capital Accounting and Valuation of Ecosystem Services) project is an important initiative **aimed at integrating natural capital and ecosystem services into national accounting frameworks**.
- The main objective of the NCAVES project is to **develop and implement a comprehensive framework for natural capital accounting and valuation of ecosystem services**. It seeks to enhance the understanding of the economic value of natural resources and ecosystem services and their contribution to the national economy.
- The NCAVES project is **implemented by the United Nations Statistics Division (UNSD)** in collaboration with various national governments. It **provides technical support, capacity building, and guidance to countries** in developing natural capital accounting systems and integrating them into their national statistical frameworks.
- The project **covers a wide range of ecosystem services**, including provisioning services (such as food, water, and timber), regulating services (such as climate regulation and water purification), and cultural services (such as recreation and cultural heritage).
- The NCAVES project promotes the **use of standardized methodologies and frameworks for natural capital accounting**. It emphasizes the measurement and valuation of ecosystem services, using both market-based and non-market-based approaches. The project provides guidance on data collection, classification, and accounting techniques to ensure consistency and comparability across countries.
- The NCAVES project is part of the broader global movement towards natural capital accounting and valuation of ecosystem services. It aligns with international initiatives, such as the System of Environmental-Economic Accounting (SEEA) and the United Nations' Sustainable Development Goals (SDGs).

### Ocean Account:

- Ocean accounts as “**integrated records of regularly compiled and comparable data concerning ocean environment assets** (e.g., extent/condition of mangroves), **economic activity** (e.g., sale of fish) and social conditions (e.g., coastal employment).”
- The objective of ocean accounts is to **provide a framework for capturing the economic value of marine resources and the services** they provide, as well as the associated environmental impacts.
- It aims to **promote sustainable management of oceans** by incorporating their economic and ecological dimensions into policy and decision-making.

### Global Ocean Accounts Partnership:

- **Global Ocean Accounts Partnership (GOAP)** is an **international initiative** that aims to promote the implementation of ocean accounts worldwide. It brings together governments, international organizations, researchers, and other stakeholders to collaborate on the development and dissemination of ocean accounting methodologies and tools.
- The primary objective of GOAP is to support countries in **implementing the System of Environmental-Economic Accounting for the Oceans (SEEA-O)**, which is a framework for measuring and valuing the economic and environmental aspects of marine resources and activities.
- GOAP aims to build capacity, share knowledge and best practices, and facilitate the integration of ocean accounts into national statistical systems.
- GOAP is a partnership between multiple organizations, including the **United Nations Statistics Division (UNSD)**, the **United Nations Environment Programme (UNEP)**, the **Food and Agriculture Organization of the United Nations (FAO)**, and the **World Bank**.
- It helps countries improve **their understanding of the economic significance of marine resources**, **assess the environmental impacts of ocean-related activities**, and make informed decisions for sustainable ocean management.

## 15. Extended Producer Responsibility improve circularity in India's waste oil management

### **Subject: Environment**

### **Section: Environment law**

**Context:** Union Budget 2023-24, presented by Finance Minister has placed emphasis on sustainable development and a circular economy in India.

### More on the News:

- The country has been pushing on the circularity of the resources for the last two-three years. The objective is to substitute natural resource consumption with equally valuable waste materials that otherwise would end up in landfills.
- Recently, the **Ministry of Environment, Forest and Climate Change (MoEFCC)** has introduced a draft notification on Extended Producer Responsibility (EPR) on waste oil. Used oil can act as a contaminant as it contains benzene, zinc, cadmium and other impurities that have the potential to pollute freshwater.

### Draft notification on Extended Producer Responsibility (EPR) on waste oil

- EPR is applicable to **producers and bulk generators** (like industry, railways, transport companies, power transmission companies, etc.), according to the draft notification.
- It recommends the **registration of stakeholders**, including producers, collection agents, recyclers and waste oil importers, on Central Pollution Control Board's (CPCB) online portal.
- The notification also talks about the **EPR targets of waste oil recycling for producers and the applicable obligations**, starting from 2024-25. The target for the base year is set as 10 per cent, which will **increase gradually by 10 per cent every year** till 2029. After this, the target will be set based on the quantity of lubrication oil sold or imported annually.
- A provision for **EPR certificate generation** and the computation of the quantity eligible for the EPR certificate is also given.
- The notification also **talks about an online portal** which CPCB will **set up for registration, filing of returns, EPR certificate generation** and tracing of oil produced or generated by any registered agency.
- MoEFCC has **provided clear demarcations** of the responsibilities of producers, waste oil importers, collection agents, recyclers, bulk generators, CPCB, State Pollution Control Boards (SPCB), states or Union Territories, municipalities, local self-governments etc.

- **Bureau of Indian Standards** is also entrusted with the important responsibility of **setting up necessary standards for re-refined oil**, which is used by producers of lubricants.
- **Environmental compensation** has been **included in the EPR along with prosecution** in case of any agency providing false information for obtaining EPR certificates. Also, the **prosecution for non-compliance** will be in addition to the environmental compensation.
- **CPCB is the designated agency** for verifying and auditing the agencies under the EPR notification.
- A **steering committee** is proposed under the EPR to **assess the draft notification's implementation, monitoring and overall supervision.**

## 16. Global warming

**Subject :Environment**

**Section: Climate Change**

### More on the News:

- The **annual mean temperature** of the world is known to **have increased by 1.1 degree Celsius** from the average of the 1850-1900 period. But this increase, as can be expected, is **not uniform**.
- It **varies in different regions** and also at **different times** of the year. This single number denoting global temperature increase, very effective for communicating the dangers of climate change, is built on top of several layers of averages.
- **Temperature rise over land is much higher than over oceans. Over land**, the annual mean temperatures have **risen by as much as 1.59 degree Celsius** since preindustrial times, according to the latest report of the Intergovernmental Panel on Climate Change. **Oceans, in contrast, have warmed by about 0.88 degree Celsius.**
- An **assessment of climate change over the Indian subcontinent**, published by the Ministry of Earth Sciences in 2020, said **annual mean temperatures had risen by 0.7 degree Celsius** from 1900. This is significantly lower than the 1.59 degree Celsius rise for land temperatures across the world. It could give the impression that the problem of climate change over India was not as acute as other parts of the world.

### Factors affecting mean temperature:

- **Altitude:** The increase in temperatures is known to be more prominent in the higher altitudes, near the Polar Regions, than near the equator.
  - The IPCC report says the **Arctic region has warmed at least twice** as much as the world average. Its current annual mean temperatures are about 2 degrees Celsius higher than pre-industrial times.
- **Albedo effect:** **Ice traps the least amount of heat and reflects most of the solar radiation** when compared with land or water. The **ice cover in the Arctic is melting**, because of which more land or water is getting exposed to the Sun.
- **Aerosols:** Aerosols refer to all kinds of **particles suspended in the atmosphere**. These particles have the **potential to affect the local temperature** in multiple ways. **Many of these scatter sunlight back**, so that **lesser heat is absorbed** by the land. Aerosols also **affect cloud formation**. Clouds, in turn, have an **impact on how much sunlight is reflected or absorbed**.
- **Higher warming over land than oceans:** **Land areas have a tendency to get heated faster, and by a larger amount, than oceans.** Daily and seasonal variations in heating over land and oceans are usually explained in terms of their different heat capacities. **Oceans have a higher capacity to cool** themselves down through the process of evaporation. The **warmer water evaporates, leaving the rest of the ocean relatively cooler.**
- **Tropical location key:** A majority of the **global landmass is concentrated in the northern latitude**. In the **tropics and along the equator, it is mostly oceans.** Land areas are also prone to faster, and greater heating.

### Why is warming over India lower?

- A major part of India's **relatively lesser warming can be attributed to its location in the lower latitudes. India, located in the tropics**, the deviation in temperature rise from the global average is not surprising.
- **Aerosol concentration over the Indian region is quite high**, due to natural as well as man-made reasons. Due to its location in the tropics and the arid climate, India is no stranger to dust. But it also happens to be experiencing heavy pollution right now. Emissions from vehicles, industries, construction, and other activities add a lot of aerosols in the Indian region. A reduction in warming could be an unintended but positive side-effect.

### Arctic Amplification:

What is Arctic amplification? What causes it?

- Global warming, **the long-term heating of the earth's surface**, expedited due to anthropogenic forces or human activities since pre-industrial times and has increased the planet's average temperature by 1.1 degrees Celsius. While changes are witnessed across the planet, **any change in the surface air temperature and the net radiation balance tend to produce larger changes at the north and south poles. This phenomenon is known as polar amplification; these changes are more pronounced at the northern latitudes and are known as the Arctic amplification.**
- Among the many global warming-driven causes for this amplification, **the ice-albedo feedback, lapse rate feedback, water vapor feedback and ocean heat transport** are the primary causes. **Sea ice and snow have high albedo (measure of reflectivity of the surface), implying that they are capable of reflecting most of the solar radiation as opposed to water and land.**
- In the Arctic's case, global warming is resulting in diminishing sea ice. **As the sea ice melts, the Arctic Ocean will be more capable of absorbing solar radiation,** thereby driving the amplification.
- **The lapse rate or the rate at which the temperature drops with elevation decreases with warming.** Studies show that the ice-albedo feedback and the lapse rate feedback are responsible for 40% and 15% of polar amplification respectively.

#### What are the consequences of Arctic warming?

- The **causes and consequences of Arctic amplification are cyclical**, what might be a cause can be a consequence
- The Greenland ice sheet is melting at an alarming rate, and the rate of accumulation of sea ice has been remarkably low since 2000, marked by **young and thinner ice replacing the old and thicker ice sheets.**
- Greenlandic ice sheet holds the second largest amount of ice, after Antarctica, and therefore it is crucial for maintaining the sea level. In 2019, this was the single biggest cause for the rise in the sea level, about 1.5 metres. **If the sheet melts completely, the sea level would rise by seven metres**, capable of subsuming island countries and major coastal cities.
- The warming of the Arctic Ocean and the seas in the region, **the acidification of water, changes in the salinity levels, is impacting the biodiversity, including the marine species and the dependent species.**
- The warming is also **increasing the incidence of rainfall** which is affecting the availability and accessibility of lichens to the reindeer.
- The Arctic amplification is **causing widespread starvation and death among the Arctic fauna.**
- **The permafrost in the Arctic is thawing and in turn releasing carbon and methane** which are among the major greenhouse gases responsible for global warming.
- Experts fear that the thaw and the melt will **also release the long-dormant bacteria and viruses that were trapped in the permafrost and can potentially give rise to diseases.** The best-known example of this is the permafrost thaw **leading to an anthrax outbreak in Siberia in 2016**, where nearly 2,00,000 reindeer succumbed.

#### What is the impact on India?

- A study titled '**A possible relation between Arctic sea ice and late season Indian Summer Monsoon Rainfall extremes**' published in 2021 by a group of Indian and Norwegian scientists found that **the reduced sea ice in the Barents-Kara sea region can lead to extreme rainfall events** in the latter half of the monsoons.
- The changes **in the atmospheric circulation** due to diminishing sea ice combined with the warm temperatures in the Arabian Sea **contribute to enhanced moisture and drive extreme rainfall.**
- According to the World Meteorological Organization's report, 'State of Global Climate in 2021', **sea level along the Indian coast is rising faster than the global average rate. One of the primary reasons for this rise is the melting of sea ice in the Polar Regions, especially the Arctic**

### 17. Outbreak of Moroccan locusts

**Subject : Environment**

**Section: Places in news**



**Context:** Outbreak of Moroccan locusts will destroy 25% of annual wheat production in Afghanistan: FAO

#### **More on the News:**

- The ‘large-scale’ outbreak of the **Moroccan locust across eight provinces** in Afghanistan’s wheat basket is likely to destroy 700,000-1.2 million tonnes of wheat or a quarter of the total annual harvest, **alerted the Food and Agriculture Organization (FAO)**.
- This translates to **\$280 million-\$480 million in economic losses**— as of today’s prices in the country, stated FAO.
- Under such circumstances, if the Moroccan locust population is **left untreated**, its **population can increase 100 times** in the next year, the FAO said. This will **create even bigger problems for agriculture and food security for Afghanistan** and that of its neighbours Tajikistan, Uzbekistan and Turkmenistan.
- In Afghanistan, **more than 6.1 million people are on the brink of famine-like conditions** which puts the country in Phase 4 (emergency) of the Integrated Food Security Phase Classification, according to the preliminary projections for November 2022-March 2023.
- It is among the countries with the **highest prevalence of insufficient food consumption**. Hunger is primarily driven by the economic crisis that has gripped Afghanistan since August 2021, compounded by decades of conflict and climate shocks, according to 2023 Global report on food crisis

#### **Reason for Outbreak:**

- Locust populations **usually go up when temperatures are above average and rainfall below normal**. The geographical spread of the Moroccan locust is **normal when spring rainfall** (from March to May) is **about 100 millimetres**.
- But **spring rainfall below 100 mm** for the second or third consecutive year usually **leads to an increase in the population of Moroccan locusts**.
- Afghanistan has entered into the third consecutive year of drought, creating the ideal environment for locusts to hatch and swarm.
- There has been a **shortage of chemical supplies** across the country. As a result of this, the traditional ‘mechanical control’ methods were used to control the outbreak. **Chemical locust control methods are far more effective than mechanical control**.
- So, effective ways to control the outbreaks is urgent funding to support both mechanical and chemical control measures, alongside on-the ground surveys to monitor and map locust hatching sites, stated the FAO.

### **18. The return of wild boars in Kashmir threatens the hangul habitat and crops**

#### **Subject : Environment**

#### **Section: Species in news**

**Context:** Wild boars resurfaced in Kashmir after 30 years, in 2013, and their number has been growing ever since, causing concern among the local residents and wildlife experts.

#### **More on the News:**

- Sightings of the fast-breeding wild boar have been increasing in Kashmir, note citizens, farmers and wildlife conservationists. The **species is not native to the region** and was declared locally extinct in the 1980s until a sighting was recorded in 2013.
- The boars are increasing the competition for resources, for the **critically endangered hanguls in Dachigam National Park**. Farmers also allege that the wild boars are damaging farmlands by uprooting their crops.
- Wildlife experts say **that increasing temperatures may have led to the resurgence of wild boars in the region**. The Department of Wildlife Protection is conducting a detailed study to understand more about the presence of wild boars in Kashmir.

#### **Dachigam National Park**

- Dachigam National Park is a **prominent wildlife sanctuary and national park** located in the **state of Jammu and Kashmir**.
- Dachigam National Park is **situated in the western Himalayas**, near the city of Srinagar in Jammu and Kashmir. It covers an area of approximately 141 square kilometers.
- The park was initially established in 1910 as a game reserve to protect the Kashmir stag (Hangul). It was later **upgraded to a national park in 1981**.
- Dachigam National Park is known for its **rich biodiversity** and is home to a variety of flora and fauna. It is particularly famous for its population of the **critically endangered Kashmir stag (Hangul)**, which is the state



animal of Jammu and Kashmir. Other wildlife species found in the park include **Himalayan black bear, Himalayan brown bear, musk deer, leopard, red fox, Himalayan weasel, and numerous bird species.**

- The park is a haven for bird enthusiasts, with a wide variety of avian species found in its forests. It is home to several endemic and migratory bird species, including the **Himalayan monal, koklass pheasant, black bulbul, Kashmir flycatcher, and white-capped redstart.**
- The park encompasses **diverse vegetation, ranging from coniferous forests to alpine meadows.** The lower areas of the park are covered with dense forests of deodar, pine, and fir trees, while the higher regions feature alpine grasslands.
- Like many other protected areas, Dachigam National Park faces various challenges, including **habitat degradation, encroachment, and poaching.** Conservation efforts are being undertaken to mitigate these threats, including habitat restoration, community participation, and strict anti-poaching measures.

### Hangul:

- Hangul, also known as the **Kashmir stag**, is a species of deer **native to the state of Jammu and Kashmir in India.**
- **Scientific Name:** Hangul is scientifically known as *Cervus hanglu*.
- Hangul primarily **inhabits the dense temperate forests** of the Kashmir Valley and its surrounding areas. It is **found at elevations ranging from 1,700 meters to 3,000 meters** above sea level.
- Hangul is a **medium-sized deer** with a distinct appearance. Adult males, known as stags, **have a majestic set of antlers** that can grow up to 11 tines or branches. Their coat is reddish-brown in summer and turns dark brown in winter. Females, known as hinds, have a lighter coat and lack antlers.
- The **hangul is a critically-endangered** species as per the International Union for Conservation of Nature and Natural Resources (IUCN) Red List, and a **Schedule I Species in as per India's Wildlife Protection Act 1972.**
- The population has **experienced a significant decline over the years due to various factors, including habitat loss, poaching, and human-wildlife conflict.**
- **Conservation Efforts:** Various conservation initiatives have been undertaken to protect and conserve the Hangul population. These efforts include **habitat restoration, anti-poaching measures, community participation, and research and monitoring programs.** The **Hangul Conservation Breeding Program at the Dachigam National Park** is one such initiative aimed at breeding and reintroducing captive-bred individuals into the wild.
- Hangul holds significant ecological and cultural value. It plays a crucial role in maintaining the biodiversity of its habitat and contributes to the ecological balance of the region. It is **also considered a flagship species for conservation efforts in the Kashmir Valley.**

### Wild boar

- Wild boar, scientifically known as *Sus scrofa*, is a species of large, wild pig that is native to Eurasia, North Africa, and parts of the Indian subcontinent.
- Wild boars are **adaptable** and can be **found in various habitats, including forests, woodlands, grasslands, and wetlands.** They are known for their **ability to thrive in different environments**, from dense forests to open fields.
- Wild boars have a **wide geographic distribution** and are found across Europe, Asia, and North Africa. They have also been introduced to other parts of the world, including the Americas and Australia, where they have established feral populations.
- Wild boars are **primarily active during the night** (nocturnal) or twilight hours (crepuscular). They are **omnivorous** and have a **varied diet that includes roots, tubers, fruits, nuts, insects, small vertebrates, and carrion.** They are known for their strong sense of smell and excellent hearing.
- Wild boars are known for their prolific breeding capabilities. **Breeding occurs throughout the year**, although there is typically a peak during certain seasons.
- Wild boars play an important **ecological role as seed dispersers and soil cultivators.** They help in the dispersal of plant seeds through their feeding and movement patterns. However, their foraging activities can also cause damage to agricultural crops and natural habitats.
- **Human-Wildlife Conflict:** In some regions, wild boars can come into conflict with human activities, especially agriculture. Their **foraging habits and rooting behavior** can cause damage to crops, resulting in economic losses for farmers. They can also **pose a threat to human safety** in certain situations.
- **Disease Concerns:** Wild boars can be carriers of certain diseases, such as African swine fever and bovine tuberculosis, which can pose risks to livestock and domestic animals. Disease surveillance and control measures are important for managing these risks.

## 19. UNFF18: Sustainable Forest management takes centre stage

### **Subject: Environment**

#### **Section: Conventions**

**Context:** Discussions on integrated policies on sustainable forest management (SFM) and energy to meet the United Nations-mandated Sustainable Development Goals (SDG) took centre stage on the fourth day of the United Nations Forum on Forests (UNFF18).

#### **More on the News:**

- The delegates at the eighteenth session of UNFF18 in New York, discussed the contributions of SFM to energy, livelihoods and the SDGs.
- Executive director of the **International Tropical Timber Organization**, emphasised its mandate to **practice SFM in tropical regions**.
- **Saudi Arabia stressed on the need to prevent forest fires and urban expansion** that encroaches on forests.
- **Forests have the potential for reducing five gigatonnes of emissions**, Mireya Atallah, head of UNEP's Nature for Climate branch, said, **citing the findings of the Emissions Gap Report**.

#### **Sustainable forest management (SFM):**

- **Definition:** Sustainable forest management (SFM) is defined as a “dynamic and evolving concept, which aims to maintain and enhance the economic, social and environmental values of all types of forests, for the benefit of present and future generations.”
- Sustainable forest management **emphasizes the concept of stewardship, which involves the responsible use and conservation of forest resources**. It involves practices such as selective logging, reforestation, and conservation of biodiversity to ensure the long-term sustainability of forests.
- Sustainable forest management **recognizes that forests provide a wide range of benefits**, including **timber and non-timber forest products**, carbon sequestration, water regulation, biodiversity conservation, and recreational opportunities. It seeks to balance these benefits for the benefit of present and future generations.
- Sustainable forest management **promotes the involvement of local communities, indigenous peoples, and other stakeholders in decision-making processes**. It recognizes their traditional knowledge and rights over forest resources and ensures their active participation in forest management.
- Forest certification systems, such as the Forest Stewardship Council (FSC) and the Programme for the Endorsement of Forest Certification (PEFC), play a crucial role in promoting sustainable forest management. These systems **provide standards and guidelines for responsible forest management** and help consumers identify sustainably sourced wood and forest products.
- Sustainable forest management **aims to protect and enhance biodiversity in forests**. It involves measures such as maintaining natural habitats, protecting endangered species, and implementing conservation strategies to preserve the ecological balance and prevent species loss.
- Forests **provide various ecosystem services**, such as carbon storage, water regulation, soil conservation, and climate regulation. Sustainable forest management recognizes the importance of these services and seeks to maintain or enhance them through appropriate management practices.
- **Monitoring and assessment of forest resources** and management practices are essential components of sustainable forest management. **Regular monitoring helps evaluate the effectiveness of management strategies**, identify potential issues, and make informed decisions for adaptive management.
- Sustainable forest management is promoted **globally through initiatives** such as the **United Nations Framework Convention on Climate Change (UNFCCC)**, **United Nations Forum on Forests (UNFF)**, and various regional and national forest policies and programs.

#### **United Nations Forum on Forests (UNFF):**

- United Nations Forum on Forests (UNFF) is a **global platform for policy dialogue, coordination, and cooperation** on forest-related issues.
- The UNFF was established in 2000 by the **United Nations Economic and Social Council (ECOSOC)** as a subsidiary body to **promote sustainable forest management** and the conservation and sustainable development of all types of forests.
- The **main mandate** of the UNFF is to **facilitate the implementation of sustainable forest management** and the achievement of internationally agreed forest-related goals, including the United Nations Strategic Plan for Forests (UNSPF).

- The UNFF operates through an intergovernmental process, **with participation from member states, international organizations, civil society, and other stakeholders**. It provides a platform for dialogue, information sharing, and collaboration on forest-related issues.
- The UNFF **holds regular sessions and meetings to review progress**, share experiences, and discuss policy options related to sustainable forest management. The sessions provide an opportunity for member states to negotiate and adopt decisions and resolutions on forest-related
- The UNFF **works towards the achievement of global forest goals**, including those outlined in the UNSPF. These goals include **halting deforestation, promoting sustainable forest management, increasing forest area, and enhancing forest-related economic, social, and environmental benefits**.
- On 27 April 2017, the UN General Assembly **adopted the first ever UN Strategic Plan for Forests 2017-2030**. The Strategic Plan provides a **global framework for actions** at all levels to **sustainably manage all types of forests and trees outside forests** and halt deforestation and forest degradation. At the heart of the Strategic Plan are six Global Forest Goals and 26 associated targets to be achieved by 2030, which are voluntary and universal.

## 20. Studies on migration patterns of milkweed butterflies

### **Subject: Environment**

#### **Section: species in news**

**Context:** Studies on migration patterns of milkweed butterflies and their feeding habits can help protect them, say researchers

#### **More on the Research Findings:**

- Millions of Milkweed butterflies **undertake a migration** between the Eastern and Western Ghats in southern India, **seeking refuge from the harsh summer**.
- This spectacular ecological phenomenon **had been recorded more than a century ago** but received little research and conservation attention until recently.
- However, a **recent study by a team of researchers shed light on the migration patterns** of Milkweed butterflies in southern India, which has the **potential to contribute to the conservation of these butterflies** and their migration in the face of ongoing changes in land use, habitat degradation, and climate warming.
- The study was published in the recent issue of the *Journal of Insect Conservation*.
- **After southwest monsoon**, Milkweed butterflies migrate westward from the Eastern Ghats and plains to the Western Ghats, **becoming active for more than two months** upon their arrival.
- Between October and April, most of the Milkweed butterflies in the Western Ghats congregate in large numbers at specific sites during winter and dry seasons. **When the summer rain cools southern India**, the **butterflies migrate eastwards** into the Eastern Ghats and the plains.
- The studies reveal that the **wings of the majority of butterflies during their eastward journey are battered than that in the westward migration**.
- Also, the researchers found that the **dominant species involved in the migration, Dark blue tiger and Double-branded crow**, are not found breeding in the mid and high-altitude evergreen and semi-evergreen forests of the Western Ghats.
- The **migration** of Milkweed butterflies also **plays a vital ecological role** during the migration. As **pollinators**, their movements can **impact entire ecosy**
- Their **migration is threatened by habitat destruction and climate change**.
- **Studying their migration patterns and feeding habits can impart the interconnectedness** of plant and animal life. By unravelling the mysteries of their migration, can help protect these beautiful creatures and the ecosystems they inhabit.

#### **Milkweed Butterflies:**

- They are any of a **group of butterflies** in the **brush-footed** butterfly family (Nymphalidae).
- There are some **300 species in the group**, including the iconic Monarch butterfly.
- Distribution:
  - The majority of species are **found in both Old and New World tropics** (Old World refers to Europe, Africa, and Asia, while New World refers to North America, South America, and the Caribbean).
  - However, **some** well-known members of the group, such as the monarch butterfly and the queen butterfly, live in **temperate regions**.
- **Features:**

- The **large, colourful adults have long, usually brownish or orange wings** marked by black-and-white patterns.
- They **fly slowly**, and some, such as the monarch butterfly, migrate great distances.
- They **feed chiefly on milkweed** and sometimes on nightshade.
- These **plants contain acrid, milky juices that probably make the larva and its subsequent stages distasteful to predators**. This, combined with a conspicuous colouration, protects them.

## 21. Climate change may wipe out Marula and Knobthorn, two tree species in Eswatini

**Subject: Environment**

**Section: Climate Change**

**Context:** Climate change may wipe out Eswatini's 2 major savanna tree species: Study

**More on the News:**

- Climate change may **wipe out Marula and Knobthorn** — two tree species in Eswatini — from their current ranges, according to a new study. These widely occurring and **dominant southern African species are critical to the functioning of lowland savannas**.
- Compared with other terrestrial biomes, **tropical savannas face heightened risks** from a rapidly changing climate, noted the study.
- A **westward shift** in the distributions of marula and knobthorn **towards central Eswatini** is anticipated **based on projected climate scenarios** from 2041 to 2070, the research added. Responses of these two keystone species to climate change may decouple them in future. Such changes in the habitat of keystone species are likely to have considerable cascading effects.
- **Marula and knobthorn showed idiosyncratic responses** across a range of climate conditions, with **marula expanding beyond current ranges** to make up for lost distributions, while **knobthorn patches receded towards the core of their ranges**, the study noted.
- This suggested that these **trees may be losing suitable climates within current ranges**. **Marula** showed evidence of tracking climate change by **emerging in previously cooler and uncolonised areas**. On the other hand, **knobthorn** is unlikely to do so. In addition, knobthorn's **spatchy distributions were limited to a smaller geographic area** — thus, any range loss can cause a local wipeout.
- **Knobthorn** was unable to establish outside of its core range and **faced limitations like land use, terrain and soil properties and herbivory to occupying broader climatic ranges**, the study found.
- **Marula** would unlikely persist in some of the region's hottest areas, with regional temperature increases for Eswatini projected to be 4°C between 2041-2070 and 2071-2100. However, the species' ability to disperse and recruit in newly suitable climates beyond current range distributions could counter these effects, the study added.
- **Africa showed an average increase in warming of approximately 0.3°C per decade** between 1991 and 2021, according to State of the Climate in Africa 2021. This was faster than the warming of 0.2°C per decade, which occurred between 1961 and 1990.

**Marula tree:**

- Marula tree (*Sclerocarya birrea*) is a **native tree species of Africa**
- The Marula tree is **found across various regions of Africa**, including South Africa, Namibia, Botswana, Zimbabwe, Mozambique, and parts of West Africa. It is **well-adapted to a range of habitats, from woodlands and savannahs to semi-arid areas**.
- The Marula tree plays a vital role in the ecosystem. Its **deep roots help stabilize soil and prevent erosion**, especially in arid and semi-arid regions. The **tree provides shade and shelter to various animal species**, including birds, insects, and mammals. It also **serves as a food source for several wildlife species**, such as elephants, giraffes, baboons, and antelopes.
- One of the significant features of the Marula tree is its fruit, known as **Marula fruit**. The fruit is small, yellowish, and **rich in vitamin C**. The fruits are used to produce various products, including **Marula oil, jams, juices**, and alcoholic beverages such as Amarula.

**Knobthorn tree:**

- Knobthorn tree (*Senegalia nigrescens*, formerly known as *Acacia nigrescens*) is a **prominent tree species native to Africa**.

- The Knobthorn tree is **found in various regions of Africa**, including South Africa, Namibia, Botswana, Zimbabwe, Mozambique, and parts of East Africa. **It thrives in diverse habitats** such as savannahs, woodlands, and dry scrublands.
- The Knobthorn tree is a **medium-sized deciduous tree** that can reach heights of up to 10-15 meters.
- It has a **characteristic appearance with a dark, rough bark and large**, swollen thorns or knobs along its branches. The tree also features feathery, compound leaves that provide a dense canopy
- Knobthorn tree has a **symbiotic relationship with nitrogen-fixing bacteria** in its root nodules. This allows it to **convert atmospheric nitrogen into a usable form**, enriching the soil with nitrogen and benefiting other plants in the vicinity.

## 22. Thawing permafrost in the Arctic

**Subject: Environment**

**Section: Climate Change**

**Context:** Thawing permafrost in the Arctic could unlock toxic waste buried for decades: New study highlights risks.

### More on the News:

- With rising global temperatures, thawing permafrost is likely to **destabilise thousands of industrial sites and linked contaminated areas** in the Arctic, which could result in the spread of toxic substances across the region, according to a new study. Nearly 2,100 industrial sites and between 5,600 and 10,000 contaminated sites are under threat of destabilisation by the end of this century.
- The study, ‘Thawing permafrost poses environmental threat to thousands of sites with legacy industrial contamination’, was published in the journal Nature Communications earlier this year.
- Contrary to **common perception**, the **Arctic is far from an uninhabited and untouched region**. It’s dotted with **countless industrial facilities such as oilfields and pipelines, mines and military bases**. All this **infrastructure is built on permafrost**, which was once believed to be perennially stable and reliable. The **toxic waste from these industrial facilities has been buried in the permafrost**, on the assumption that it would stay locked away permanently. But danger looms as the planet continues to heat up.

### What is permafrost?

- Permafrost is essentially **any ground that stays frozen — 0 degree Celsius or lower — for at least two years straight**. These permanently frozen grounds are often found in Arctic regions such as Greenland, Alaska (the United States), Canada, Russia and Eastern Europe.
- According to the National Aeronautics and Space Administration (NASA), permafrost is composed of “a **combination of soil, rocks and sand that are held together by ice**. The soil and ice in permafrost stay frozen all year long.” However, although the ground remains perennially frozen, permafrost regions aren’t always covered with snow.

### What are the findings of the study?

- It was because of these characteristics that countries and corporations began building infrastructure on the Arctic’s permafrost. The region witnessed a further **expansion of industrial and economic development during the Cold War** — it became a **centre for resource extraction and military activities**. This led to the accumulation of industrial and toxic waste on or in permafrost which was never removed.
- But as the **Arctic is getting warmer nearly four times** as fast as the rest of the planet due to climate change, **permafrost is thawing rapidly**, which **could destabilise** not only the industrial sites but also the contaminated areas. And once the destabilisation takes place, **toxic substances would be unleashed across the region**, threatening numerous species living there and the health of people who depend on them.
- Using the data, **team extrapolated where industrial contamination and permafrost might coexist across the entirety of the Arctic** and found that the 4,500 industrial facilities in the permafrost regions have most likely produced between 13,000 and 20,000 contaminated sites. The team then used computer simulations to find out the impact of climate change on these sites.
- According to the study, as of now, around 1,000 of the known industrial sites and **2,200 to 4,800 of the known contaminated sites are already at risk of destabilising** due to thawing permafrost.
- These numbers will jump to more than 2,100 industrial sites and 5,600 to 10,000 contaminated sites by the end of the century under the low emissions scenario consistent with the **2-degree Celsius global warming target**. And if the world continues to get warmer at present levels, **almost all of the known industrial and contaminated sites would be affected**.

### What are the other consequences of thawing permafrost?



- According to experts, thawing permafrost can severely impact the planet. One of its most **dangerous consequences is the release of greenhouse gases** into the atmosphere. A 2022 report by NASA said, “Arctic permafrost **alone holds an estimated 1,700 billion metric tons of carbon**, including **methane and carbon dioxide**. That’s roughly 51 times the amount of carbon the world released as fossil fuel emissions in 2019.”
- Moreover, “Plant matter frozen in permafrost doesn’t decay, but when permafrost thaws, **microbes within the dead plant material start to break the matter down**, releasing carbon into the atmosphere,” it added.

### 23. As sea levels rise, is land reclamation still a good idea?

**Subject: Environment**

**Section: Climate Change**

**Context:** With coastal areas around the world threatened by rising sea levels and increasingly destructive storms, should we still be creating new land in our oceans?

**Concept:**

**What is Land Reclamation?**

- Land reclamation is **the process of creating new land from the sea**.
- The simplest method of land reclamation **involves simply filling the area with large amounts of heavy rock and/or cement, then filling with clay and soil until the desired height is reached**.
- Draining of submerged wetlands is often used to reclaim land for agricultural use.
- The first major land reclamations were carried out in the 1970s, when the Port of Rotterdam in the Netherlands was extended.

**Need for Land Reclamation:**

- As climate change contributes to rising sea levels, and the population continues to increase, it looks likely that land reclamation will be used more often as a way to get the land people need to live
- Demand for land has increased massively of rising populations, globalization, and climate change
- Landscape reclamation is being employed in various regions of the world to remedy contaminated and ruined areas like the deserted coal mining, crude oil exploration, conversion of wasteland, controlling gully and soil erosion and abandoned aquaculture etc
- **Nearly 90% of that land was created in East Asia, most often to make way for industry and port facilities** catering to the globalized economy

**Impact of land reclamation**

- Reclamation could **cause permanent damage to maritime organisms** and wildlife and their migration to uninfluenced areas lead to economic and medicinal habitat losses and other plant species.
- Changes in **the river channel through channeling or dredging impact the water system** by extending river length and river width that influences river flow dynamics and hydrology
- Significant resources are needed for maintaining the drainage system. This makes it not just ecologically but also economically impossible to sustain certain drained areas
- Vegetation **clearance loosens the earth and makes it susceptible to erosion**.

### 24. Sea butterflies are threatened by climate change

**Subject: Environment**

**Section: Climate Change**

**Context:** Ocean acidification more dangerous for shelled, smaller sea butterflies but can impact entire ocean food web.

**More on the News:**

- The stunning sea butterflies, a suborder of sea snails, are tiny creatures that **play a big role in the marine ecosystem**. But the smallest species in this group found in the Southern Ocean are **extremely vulnerable to climate change** and their population is shrinking in a warming world, according to a new study.
- The **shelled pteropods** (group of free-swimming sea snails) **live at or very close to the ocean surface**. Like snails, they have muscular feet that they use as flappers to swim around in water, instead of glide on solid surface.
- As the **sea absorbs an increasing quantity of carbon dioxide (CO<sub>2</sub>) that turns the water more acidic**, the thin outer casing, or the ‘homes’ of these small sea butterflies, **dissolve**. This leaves them exposed, making it difficult for these delicate species to survive.



- While these beautiful creatures dying out are bad news in itself, their **reduced population also impacts larger pteropods** and other oceanic creatures that feed on them. **The entire underwater food chain of the seas surrounding Antarctica may suffer as a ripple effect.**
- The ocean is the **most acidic in winter because cooler water absorbs more CO<sub>2</sub>**. This means, the winter months are the most dangerous for the shelled sea butterflies.

### Sea Butterflies:

- Sea butterflies, also known as **pteropods**, are a group of **small marine gastropod** mollusks that belong to the family Thecosomata. They are **notable for their unique shell** structure and their role in marine ecosystems.
- Sea butterflies are **planktonic organisms** characterized by a distinct shell structure. Their shells are delicate, translucent, and often have a wing-like shape, resembling a butterfly. **The shells are secreted by the sea butterflies themselves** and provide protection for their soft bodies.
- Sea butterflies **are found in oceans around the world**, from polar to tropical regions. They are **most abundant in the upper layers of the ocean**, particularly in areas with high productivity and concentrations of plankton.
- Sea butterflies are **herbivorous organisms** that feed primarily on phytoplankton, microscopic plants found in the ocean. They use a **specialized feeding apparatus called a “radula” to scrape and consume the phytoplankton**. In turn, they serve as an important link in the marine food chain, transferring energy from primary producers to higher trophic levels.
- Sea butterflies **play a significant role in the global carbon cycle**. They incorporate calcium carbonate into their shells through a process known as calcification.
- Sea butterflies are an **important food source for various marine organisms, including fish, seabirds, and whales**. Their abundance and distribution can influence the distribution and abundance of other species within the marine food web. Changes in sea butterfly populations can have cascading effects throughout the ecosystem.

## 25. Leveraging carbon storage

**Subject: Environment**

**Section: Climate Change**

**Context:** India must look at pumping carbon underground.

### More on the News:

- India has committed to **achieving a 45 per cent reduction in emissions intensity** of GDP by 2030, and achieving **net-zero greenhouse gas emissions by 2070**. India needs to evaluate all options to lower its emissions footprint. Carbon capture and storage (CCS) is one such important lever.
- Four different types of underground geological formations that can be utilised for storing carbon:
  - Depleted oil and gas reservoirs can be injected to increase oil and gas recovery, referred to as **Enhanced Oil Recovery (EOR)**, and in the process also store some amount of carbon dioxide.
  - Carbon dioxide can be injected into coal seams for storage and to extract methane (similar to natural gas) for commercial value, referred to as **Enhanced Coal Bed Methane Recovery (ECBMR)**.
  - **Salty mineral water accumulations** referred to as saline aquifers
  - **Basalt mineral rock formations** that can store carbon dioxide underground.

### Opportunity:

- CCS allows for the **gradual reduction of coal usage** while still decarbonising the economy.
- India is also one of the few countries with **large onshore basalt formations**. CCS in basalt is unique **because the carbon dioxide injected underground is converted into solid minerals over time**. This almost **eliminates the risk of leakage**, and post-injection monitoring over long periods can ensure the integrity of the underground geology.

### Suggestions:

- First, while EOR is being commercially planned in the coming years, **basalt formations should be assessed and explored for potential** on priority.
- Second, the **government can license out acreage for exploitation of basalt and saline aquifer formations** similar to oil and gas today, which will not only generate revenue but also spur CCS projects. India should also consider allowing for storage of other countries' carbon dioxide in our basalt formations.
- Third, the **regulatory authorities need to identify and develop standards and regulations** to speed up approval of CCS exploratory, pilot and commercial projects.

- And finally, the **Department of Science and Technology** should build a **collaborative network** domestically and connect with international bodies for knowledge transfer and sharing of experience.

## 26. Remediation of legacy waste dumpsites

### **Subject: Environment**

#### **Section: Pollution**

**Context:** The recent past has seen a paradigm shift in waste management policy in India, focussing extensively on the remediation of legacy waste dumpsites in the country.

#### **More on the News:**

- A proper **roadmap to divert the combustibles** (plastics, paper, textiles, leather, wood, etc) **recovered during the biomining process** would be extremely critical to dumpsite remediation.
- The **combustible fraction constitutes about 8-20 per cent of the legacy waste** in an old dumpsite. That means India has to deal with nearly 13 million-32 million tonnes of combustible materials lying in around 3,159 dumpsites in the country.
- These **combustible materials** (typically referred to as segregated combustible fraction or SCF) are **excavated as an end-product of the legacy waste dumpsite remediation process**.
- SCF are typically **contaminated with inert material and high moisture content** (more than 30 per cent), making **it not so desirable for the cement factories**.
- As a result, many urban local bodies are struggling to find economically viable options for the disposal of recovered material, including combustibles.
- Currently, the **only available option is co-processing in the cement industry**. Co-processing refers to the **use of waste materials having high calorific value as alternative fuels or raw materials (AFR)** to recover energy and material from them.
- Due to the high temperature in cement kilns, different types of waste can be effectively disposed of without harmful emissions.
- A variety of wastes, including **industrial wastes and plastics, can be disposed of in an environmentally safe and sound manner through the technology of co-processing** in cement kilns, according to the **Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal**.
- In cement kilns, **different kinds of hazardous and non-hazardous wastes, including plastic wastes, get utilised as AFRs**.
- During the usage of plastic wastes in cement kilns as AFRs, the material and energy value present in them get fully utilised in the cement kiln. In this manner, **plastic waste can replace the raw materials and fossil fuels** that are conventionally utilised in kilns.

#### **Challenges in Co-processing:**

- **Expensive additional critical infrastructure** required for co-processing the SCF recovered from biomining.
- **Quality of RDF** (recovered from biomining of legacy waste dumpsites): compromised due to **high moisture and ash content**.
- High cost of transportation

#### **Recommendations:**

- These are the recommendations to amend the Solid Waste Management Rules 2016 as suggested by MoHUA:
- The cement plants located within 400 km of a solid waste-based RDF plant shall make necessary arrangements to utilise RDF in the following phase-wise manner at a price fixed by the state government. Such units should:
  - **Replace at least 6 per cent of fuel intake within one year** from the date of amendment of these rules (equivalent calorific value/thermal substitution rate) by municipal solid waste-based SCF and/or RDF, subject to the availability of RDF.
  - **Replace at least 10 per cent of fuel intake within two years** from the date of amendment of these rules (equivalent calorific value/thermal substitution rate) by Municipal Solid Waste based SCF and/or RDF, subject to the availability of RDF.
  - **Replace at least 15 per cent of its fuel intake within three years** from the date of amendment of these rules (equivalent calorific value/Thermal Substitution Rate) by Municipal Solid Waste based SCF and/or RDF, subject to the availability of RDF.

- The transport cost for SCF/RDF up to 100 km from the cement plant shall be borne by the cement plant; however, beyond 100 km cement plant can transport at its own cost or by ULBs as mutually agreed upon by the parties.

## 27. Integrated farming systems

### **Subject – Environment**

#### **Section: Climate Change**

**Context** – Integrated farming systems emerge as possible climate adaptation solution

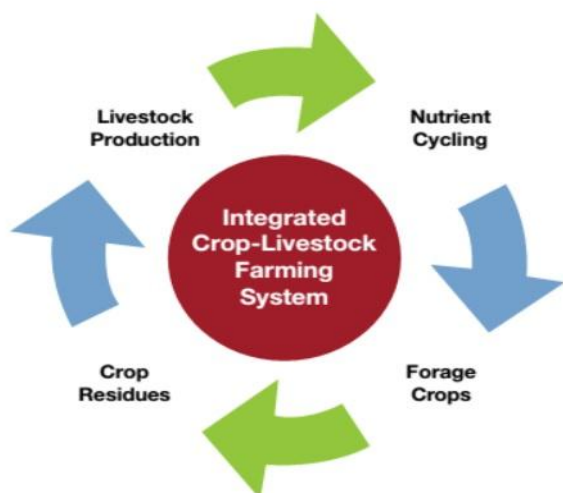
**Concept** –

- Integrated Farming System (IFS):- A sub system of a high level land use system like a village or a watershed which includes crop production, raising livestock, fishery, poultry, beekeeping etc. on a particular farm with a objective of higher profitability without altering ecological and socio-economic balance on one hand and to meet the national goals on the other hand.



### Components Of Integrated Farming System

- Crops, livestock, birds and trees are the major components of any IFS.
- Crop may have subsystem like monocrop, mixed/intercrop, multi-tier crops of cereals, legumes (pulses), oilseeds, forage etc.
- Livestock components may be milch cow, goat, sheep, poultry, bees.
- Tree components may include timber, fuel, fodder and fruit trees.



### **Advantages of Integrated Farming System**

- Higher food production to equate the demand of the exploding population of our nation
- Increased farm income through proper residue recycling and allied components
- Sustainable soil fertility and productivity through organic waste recycling
- Integration of allied activities will result in the availability of nutritious food enriched with protein, carbohydrate, fat, minerals and vitamins
- Integrated farming will help in environmental protection through effective recycling of waste from animal activities like piggery, poultry and pigeon rearing
- Reduced production cost of components through input recycling from the byproducts of allied enterprises
- Regular stable income through the products like egg, milk, mushroom, vegetables, honey and silkworm cocoons from the linked activities in integrated farming
- Inclusion of biogas & agro forestry in integrated farming system will solve the prognosticated energy crisis
- Cultivation of fodder crops as intercropping and as border cropping will result in the availability of adequate nutritious fodder for animal components like milch cow, goat / sheep, pig and rabbit
- Firewood and construction wood requirements could be met from the agroforestry system without affecting the natural forest
- Avoidance of soil loss through erosion by agro-forestry and proper cultivation of each part of land by integrated farming
- Generation of regular employment for the farm family members of small and marginal farmers.

## **28. Climate Smart Agriculture**

### **Subject: Environment**

#### **Section: Climate Change**

A range of agricultural practices that transform agricultural systems to support food security in the face of climate change has been collectively known by the name „climate-smart agriculture“ (CSA). A CSA approach tries to integrate climate change into planning and implementation of sustainable agricultural practices. It also aims to increase the resilience of agriculture to climate variability through better adaptation to climate change and reduce agriculture’s contribution to global warming.

#### **Climate Smart Agriculture: Characteristics**

Contrary to conventional agricultural development, CSA systematically integrates climate change into the planning and development of sustainable agricultural systems. v CSA’s three primary pillars are interrelated concerns-increased productivity, enhanced resilience and reduced emissions. However, the resultant trade-offs often cannot maximize the pillars simultaneously, only optimize them. v CSA maintains ecosystem services: Ecosystems provide the agricultural sector with a number of unpaid services –clean natural water, materials, food, sunlight etc. CSA attempts to ensure the sustainability of these services, preventing their degradation. v CSA is not a rigid set of particular practices, technologies or methodologies- it is only a concept amenable to adaptation. It has multiple entry points, ranging from the development of technologies and practices to the elaboration of climate change models and scenarios, information technology, insurance schemes, value chains and the strengthening of institutional and political enabling environments.

Key Government Initiatives on CSA

**National Innovation on Climate Resilient Agriculture (NICRA):** National Innovations in Climate Resilient Agriculture (NICRA) is a network project of the Indian Council of Agricultural Research (ICAR) launched in February, 2011 with an outlay of Rs.350 crores. The project aims to enhance the resilience of Indian agriculture, covering crops, livestock and fisheries to climatic variability and climate change through development and application of improved production and risk management technologies. National Mission on Sustainable Agriculture (NMSA) The Government is implementing the National Action Plan on Climate Change (NAPCC) which provides the overarching framework for climate actions, through national missions in specific areas.

**The National Mission for Sustainable Agriculture (NMSA),** one of the Missions under NAPCC, includes programmatic interventions like Soil Health Card, Paramparagat Krishi Vikas Yojana, Mission Organic Value Chain Development for Northeastern Region, Rainfed Area Development, National Bamboo Mission and Sub-mission on Agro-Forestry. The NMSA works through adoption of sustainable development pathway by progressively shifting to environment friendly technologies, adoption of energy efficient equipments, conservation of natural resources, integrated farming, etc. Besides, the NMSA aims at promoting location specific improved agronomic practices through soil health management, enhanced water use efficiency, judicious use of chemicals, crop diversification.

**The National Adaptation Fund for Climate Change (NAFCC):** The National Adaptation Fund for Climate Change (NAFCC) was established to meet the cost of adaptation to climate change for the State and Union Territories of India that are particularly vulnerable to the adverse effects of climate change. This Scheme was implemented during 2015-16 mainly for supporting concrete adaptation activities dealing with mitigating the adverse effects of global climate change in various sectors including agriculture. Under the NAFCC, various projects have been sanctioned in different states i.e., Punjab, Himachal Pradesh, Odisha, Manipur, Tamil Nadu, Kerala, Mizoram, Chhattisgarh, J&K, Meghalaya, Telangana, Andhra Pradesh etc.

**Climate Smart Village:** Climate-smart village (CSV) is an institutional approach to test, implement, modify and promote CSA at the local level and to enhance farmers' abilities to adapt to climate change. The CSV adopts a portfolio of interventions to tackle the climate challenges of the agriculture sector that cover the full spectrum of farm activities. Various Consultative Group on International Agricultural Research (CGIAR) centers and national research organisations are putting their concerted efforts into the CSVs in India. CSVs were piloted in two states of India: Karnal district of Haryana state and Vaishali district of Bihar state which later spread into districts of Punjab, Andhra Pradesh and Karnataka.

**Pradhan Mantri Krishi Sinchayee Yojna (PMSKY):** This Scheme was planned and formulated to give more priority on water conservation and its management in agriculture with the vision to extend the area under irrigation from 1 July 2015. The main motto of this Scheme is 'Har Khet Ko Paani' to improve water use efficiency. 'More crop per drop' scheme provide end-to-end solutions in water on source creation, distribution channels and its management.

**Pradhan Mantri Fasal Bima Yojna (PMFBY):** The Pradhan Mantri Fasal Bima Yojana (PMFBY) introduced in the country from Kharif 2016 season is voluntary for States/UTs as well as for farmers. States/UTs can participate in the scheme keeping in view their risk perception and financial considerations etc. From inception of the scheme till 2020-21 cumulatively 2,938.7 lakh farmer applications for a sum insured of Rs. 10,49,342 crore have been enrolled under the scheme.

**Soil Health Card Scheme:** This Scheme was launched in February, 2015 to issue soil health cards (SHC) to the farmers providing detailed information on test-based soil nutrient status of their own land along with recommended dose of fertilizers for improving productivity through judicious use of inputs. The Government of India targeted to issue 10.48 crores of SHCs since inception of the Scheme.

**National Water Mission (NWM):** A Mission was mounted to ensure Integrated Water Resource Management (IWRM) for conserving the water sources and minimizing its wastage, and also to optimize Water Use Efficiency (WUE) by 20 per cent including agriculture sector.

**Paramparagat Krishi Vikas Yojna (PKVY):** It is an extended component of Soil Health Management (SHM) launched in 2015 under NMSA with the objective of supporting and promoting organic farming through adoption of organic village by cluster approach, which in turn result in improvement of soil health. **Biotech-KISAN:** It is a scientist-farmer partnership scheme launched in 2017 for agriculture innovation with an objective to connect science laboratories with the farmers to find out innovative solutions and technologies to be applied at farm level. Under this scheme, so far 146 Biotech-KISAN Hubs have been established covering all 15 agroclimatic zones and 110 aspirational districts in the country. The scheme has benefitted over two lakhs farmers so far by increasing their agriculture output and income. Over 200 entrepreneurship have also been developed in rural areas.



**Neem Coated Urea:** It is a form of urea fertilizer coated with neem extracted material, which acts as a slow releaser of nitrogen reducing the pest and disease infestation ultimately minimizing the usage of chemicals in farming by achieving the overall increase in crop yield.

**Sub-mission on Agro-forestry:** This Mission was launched during 2016-17 with the objective of planting trees on farm bunds. Agro-forestry has the potential to bring sustainability in agriculture and also achieving the optimum productivity by mitigating the impact of climate change.

**National Livestock Mission:** This Mission was initiated by the Ministry of Agriculture and Farmers' Welfare and got commenced from 2014-15 focusing mainly on livestock development through sustainable approach ultimately protecting the natural environment, ensuring bio-security, conserving animal bio-diversity and farmers' livelihood.

## 29. Cheetahs are difficult breeders, but Kuno death was avoidable: here's why

**Subject: Environment**

**Section: Species in news**

**Context:** A South African female cheetah died of injuries apparently inflicted by two males looking to mate with her in Kuno, Madhya Pradesh, last week.

**Cheetahs:**

- **Fastest mammal on land**, the cheetah can reach speeds of 60 or perhaps even 70 miles an hour over short distances
- **The gestation (pregnancy) period for the cheetah is 93 days**
- Cheetahs in the wild (both male and female combined) have an average age span of 10 – 12 years.
- The average lifespan of an adult male in the wild skews lower (8 years), due in part to territorial conflicts with competing groups of males
- **The cheetah is a sexually dimorphic species though it is difficult to identify cheetahs' sex by appearance alone**
- As the female siblings become sexually mature they will split from the group to lead a largely independent life.
- Male siblings remain together for the rest of their lives, forming a group known as a coalition. Coalitions increase hunting success and act as a defense against other predators.
- **Females lead solitary lives unless they are accompanied by their cubs. Unlike male cheetahs that prefer to live in set territories with their coalition**, females travel within "home ranges" that overlap multiple male groups' territories
- **Estrus in female cheetahs is not predictable or regular. This is one of the reasons why it is difficult to breed cheetahs in captivity.**
- Mating receptivity depends on environmental factors that are triggered by the proximity of males and their scent markings

### Kuno National Park

- Kuno is a National park in **Madhya Pradesh, India**.
- It was established, in 1981, as a wildlife sanctuary in the Sheopur and Morena districts. It was also known as Kuno-Palpur and Palpur-Kuno Wildlife Sanctuary.
- In 2018, it was given the status of a National Park.
- It is part of the **Khathiar-Gir dry deciduous forests ecoregion**.
- The protected area is **largely dry, deciduous forest**.

### **Additional info:**

The cheetah was declared extinct in India in 1952. Since then, the grasslands of the country, of which the cheetah was the keystone species, have also disappeared.

**African Cheetah** IUCN status – Vulnerable

**Asian Cheetah** IUCN Status – Critically Endangered.

## 30. Global warming now more likely to breach 1.5°C threshold by 2027

**Subject : Environment**

**Section: Climate change**



**Context:** Partially responsible for boosting the chance of hitting 1.5°C is an El Nino weather pattern expected to develop in the coming months.

#### **More on the News:**

- For the first time ever, global temperatures are now **more likely than not to breach 1.5°C (2.7°F) of warming within the next five years**, the World Meteorological Organization said on May 17.
- But that did **not necessarily mean the world would cross the long-term warming threshold of 1.5°C above preindustrial levels** set out in the 2015 Paris Agreement.
- **Partially responsible for boosting the chance of hitting 1.5°C is an El Nino** weather pattern expected to develop in the coming months. During this natural phenomenon, **warmer waters in the tropical Pacific heat the atmosphere above**, spiking global temperatures.
- The El Nino “will **combine with human-induced climate change** to push global temperatures into uncharted territory”, said WMO Secretary-General
- Still, the likelihood of temporarily exceeding 1.5°C has increased over time. Between 2017 and 2021, for example, scientists estimated just a 10% chance of hitting 1.5°C.
- Unlike the U.N. Intergovernmental Panel on Climate Change’s climate projections which are based on future greenhouse gas emissions, the **WMO update provides more of a prediction-based long-range weather forecast.**
- The WMO also **found a 98% chance that one of the next five years will be the hottest on record**, surpassing 2016 which saw global temperature impacted by about 1.3°C (2.3°F) of warming.
- The **hottest eight years ever recorded were all between 2015 and 2022**, with 2016 the warmest — but temperatures are forecast to increase further as climate change accelerates.
- **World Meteorological Organisation (WMO):**
  - The **WMO** is an **intergovernmental organization** with a membership of **192 Member States** and Territories.
  - **India** is a member of
  - It **originated** from the **International Meteorological Organization (IMO)**, which was established after the **1873 Vienna International Meteorological Congress.**
  - Established by the ratification of the **WMO Convention** on 23rd March 1950, **WMO** became the **specialized agency of the United Nations for meteorology** (weather and climate), operational hydrology and related geophysical sciences.’
  - WMO also **encourages research and training in meteorology and hydrology** and their related applications and contributes towards reducing the impact of weather- and climate-related hazards.
  - **Predictions concerning locust swarms and the transport of pollutants** (nuclear and toxic substances, volcanic ash) are also **provided by WMO Members.**
  - **WMO** is headquartered in **Geneva, Switzerland.**
- **Reports:**
  - Greenhouse Gas Bulletin.
  - Status of the World Climate.

### **31. Warming water and pollution amplify fish mortality in Kerala during summer**

**Subject :Environment**

**Section: Pollution**

**Context:** Warming water and pollution from industries, chemicals and pesticide run offs, lead to fish kill during summer months.

#### **More on the News:**

- A study published in August 2022, **predicts a six-fold increase in the frequency of fish mass die-offs across the world by 2100** due to summer kills (mortalities associated with warm temperature), winterkills (mortalities associated with cold temperatures) and infectious pathogens.
- In the lakes of the northern hemisphere, it has been observed that **warming of water amplifies the frequency of fish mass mortality events.**
- In Kerala, the **month of May with high temperatures has typically recorded the most fish kills** – the phenomenon when a large number of fish in a particular area die and float on the surface within a short period of time.

#### **Causes of Fish Mortality:**

- **Low water flow and oxygen**

- **Rapid changes in temperature** affect a wide range of fishes regardless of their **thermal tolerance**. Each organism has its **own levels of tolerance for low dissolved oxygen**, but levels under 3mg/L are largely toxic to fishes. They are often seen coming to the surface of water and gasping for air.
- **Fishes are very sensitive to changes in water quality**, the pH of the water, salinity and oxygen quantity. These **changes can disrupt the ecological balance** in the water bodies, leading to the **growth of harmful algal blooms** and other aquatic pathogens.
- **Water pollution**
  - **Excessive amount of chemicals** used in agriculture and their run-off are also a major concern. These **chemicals accumulate in the water and is toxic to fish causing respiratory and reproductive disorders**.
  - The excessive use of chemicals in aquaculture, such as **antibiotics and pesticides may also lead to fish kills**.

#### Prevention of fish kills:

- Adopt **sustainable practices in aquaculture, reduce pollution** and promote conservation of water bodies.
- **Increasing green cover** is very important strategy to prevent fish kills.
- The dams should **release enough water into the rivers in summer to allow at least a minimum flow**.
- An **oxygen diffuser should be used** in fish farms and ponds

### 32. In remote J&K national park, camera traps snap elusive snow leopard, read out a success story

#### **Subject :Environment**

#### **Section: Species in news**

**Context:** The Jammu and Kashmir Wildlife Protection Department's confirmation on the presence of at least half-a-dozen snow leopards at high-altitude Kishtwar National Park

#### **Concept:**

- The **Snow Leopard (also known as Ghost of the mountains)** acts as an indicator of the health of the mountain ecosystem in which they live, due to their position as the top predator in the food web.
- The Snow Leopard lives at high altitudes in the steep mountains of Central and Southern Asia, and in an extremely cold climate.
- They **inhabit the higher Himalayan and trans-Himalayan landscape in the states/union territories of Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim, and Arunachal Pradesh**.
- India is a unique country to have a good presence of 5 big cats, including Snow Leopard. The other 4 are, Lion, Tiger, Common Leopard, and Clouded Leopard.
- The **snow leopard's habitat range extends across the mountainous regions of 12 countries across Asia:** Afghanistan, Bhutan, China, India, Kazakhstan, Kyrgyz Republic, Mongolia, Nepal, Pakistan, Russia, Tajikistan, and Uzbekistan
- Out of the total range covers an area, **60% of the habitat found in China**.

**Threat:** Factors that have contributed to the decline in the snow leopard populations include, reduction in prey populations, illegal poaching and increased human population infiltration into the species habitat and illegal trade of wildlife parts and products among others.

#### **Protection:**

- IUCN Red List- Vulnerable
- Convention on International Trade in Endangered Species (CITES)- Appendix I
- Convention on Migratory Species (CMS)- Appendix I
- Appendix I includes species threatened with extinction.
- Indian Wildlife (Protection) Act 1972- Schedule I
- Schedule I provides absolute protection and offences under this have the highest penalties.

#### **Kishtwar National Park**

- It is located in **Jammu and Kashmir**
- It is bounded to the north by Rinnay river, south by KibarNala catchment, east by main divide of Great Himalaya and west by Marwah river
- It was declared a **national park on February 4, 1981**.
- It has an **altitude range of 1700 to 4800 Metres**.

- The National Park encompasses the catchment area of Kiber, Nanth and KiyarNallas, all of which drain south-west into Marwah river locally called MarivSudir which joins Chenab
- The national park in Kishtwar attracts wildlife lovers with its rich flora & fauna which comprises **musk deer and Himalayan brown bear**.

### 33. EU -Deforestation Regulation (EU-DR)

**Subject :Environment**

**Section: International convention**

**Concept :**

- It is a European Union regulation that aims to counter deforestation by requiring companies registered in the EU that import or export specific items (list of 479 for India) have not been produced on land that was deforested after December 31, 2020. Items include: wood, palm oil, soy, coffee, cocoa, rubber, and leather.
- There is criticism that this is just a form of **non-tariff barrier** to trade, as EU itself has reduced its primary forest cover to increase agricultural output before the said date, and now is not allowing other countries to do the same as they struggle with population pressure on resources.
- India's stand is that it violates **Most Favored Nation (MFN)** and **National Treatment principles**. This is the second such measure by the EU after its **Cross Border Adjustment Mechanism**. It is estimated that both together are likely to adversely affect exports from India to EU worth \$9.5 billion.
- As a measure to implement the regulation, the EU is likely to require exporters to use a block-chain enabled trace and track system, similar to the one used by **Agricultural and Processed Food Products Export Development Authority (APEDA)** for grape exports to the EU. This is most likely to impact smaller companies as it will add to compliance burden and operational costs.

### 34. Arsenic Exposure

**Subject : Environment**

**Section: Pollution**

**Concept :**

- A recent peer-reviewed study suggests that even low levels of arsenic consumption may impact cognitive function in children, adolescents, and young adults.

**Arsenic**

- Arsenic is a chemical element with the symbol As and atomic number 33.
- **Arsenic occurs in many minerals, usually in combination with sulfur and metals, but also as a pure elemental crystal.**
- **Arsenic is a metalloid.** It has various allotropes, **but only the gray form, which has a metallic appearance, is important to industry.**
- The primary use of arsenic is in **alloys of lead**(for example, in car batteries and ammunition).
- Arsenic is a **common n-type dopant in semiconductor electronic devices**. It is also a component of the **III-V compound semiconductor gallium arsenide**.
- Arsenic and its compounds, especially the trioxide, are used in the **production of pesticides, treated wood products, herbicides, and insecticides**.
- These applications are declining with the increasing recognition of the toxicity of arsenic and its compounds.

**Impact of Arsenic Contamination**

- Arsenic is **highly toxic in its inorganic**
- People are exposed to elevated levels of inorganic arsenic through drinking contaminated water, using contaminated water in food preparation and irrigation of food crops, industrial processes, eating contaminated food and smoking tobacco.
- Long-term exposure to inorganic arsenic, mainly through drinking-water and food, can lead to chronic arsenic poisoning. Skin lesions and skin cancer are the most characteristic effects.

**What Is the Permissible Limit?**

- The **recommended limit is 10 10ug/l**. Arsenic contamination in communities across India has increased by 145 per cent in the past five years, according to a report by The Guardian.
- In rural parts of the country, it is wreaking havoc in the lives of people.

- Arsenic contamination in India was widespread in the 1990s in West Bengal and later in Bihar, Jharkhand, Uttar Pradesh, Assam and Manipur.

### 35. Ecofeminism

#### **Subject : Environment**

#### **Section: Msc**

**Context:** German scholar and feminist Maria Mies passed away recently. Vandana Shiva, who co-wrote the book Ecofeminism with her, speaks about Mies and their work together.

#### **More on the News:**

- Maria Mies, a Marxist Feminist scholar and academic, **passed away** on May 16 at the age of 92.
- For decades, Mies **wrote extensively on how patriarchy, capitalism, and colonialism** have exploited women as well as nature. The German activist had a long association with India, teaching at the Goethe-Institut in Pune from 1963 to 1967 and returning to the country several times. Her PhD thesis was published in 1980 under the title **Indian Women and Patriarchy**.
- In 1993, Mies **co-wrote the important book Ecofeminism** with Vandana Shiva, scientist and activist.

#### **Ecofeminism:**

- Ecofeminism is a worldview that **recognises that humans are part of Nature, not separate**. In their **interconnectedness through life, Nature and Women** are Alive and Autonomous, not dead passive objects to be exploited and violated by masculine power.
- Ecofeminism is a philosophical and social movement that **explores the connections between the oppression of women and the exploitation of nature**. It highlights the **intersections between gender inequality and environmental issues**, arguing that both are rooted in similar systems of domination and hierarchical thinking.

#### **How does capitalism take away women's control over farming?**

- Capitalist Patriarchy as a world view and a system of knowledge as well as organising the economy has been **instituted over the last few centuries, through colonialism, fossil fuel industrialism, and the rule of violence**, greed, and destruction of nature and cultures.
- Capitalist Patriarchy **assumes nature is dead matter, and women are passive**. The unit of capitalist patriarchy is the corporation, with the first corporation created as the East India Company in 1600. The British Empire was an empire of cotton, extracting \$ 45 trillion from India, leaving a trail of famines.
- Corporations are a **patriarchal construct**, made in the image of a rich white man. **Corporations work for only one objective, profits**.
- They introduced war chemicals as agrochemicals in agriculture. They **shaped the rules of WTO, which include the Intellectual Property Rights and ownership of seeds** written by Monsanto [an agrochemical company], **free trade in agriculture** written by Cargill, and the **Sanitary and PhytoSanitary agreement** written by the junk food industry — Pepsi, Coke, Nestle.
- Women have been the Seed keepers and breeders, most farmers are women, all artisanal food processing was in women's hands. The **Corporations entering agriculture have displaced women** from the seed sector, from agricultural production, from food processing.

#### **How does climate change impact women disproportionately?**

- Climate Change is a consequence of capitalist patriarchy, the **arrogance of denying that nature is living**, and that **women have knowledge to work and produce without fossil fuels and chemicals** driving climate change.
- The first impact is the **denial of women's knowledge and economies**.
- The second impact is the **consequences of climate change in terms of increased intensity and frequency of cyclones**, flooding, droughts. **Women are the most vulnerable** in times of climate disasters.
- Women's practices of resilience, such as conserving seeds of climate resilience, practising regenerative ecological organic agriculture, building local economies, show the path to mitigating climate impact, while building resilience to climate change.

### 36. Forests have limited carbon sequestration potential

#### **Subject :Environment**

#### **Section: Climate change**

### More on the News:

- Researchers have investigated the **natural limits to additional carbon accumulation** in the biomass of forests in the hypothetical absence of all direct human forest management activities.
- Under current climatic conditions and the removal of all forest management activities, existing forests could increase biomass by 44.1 petagrams of carbon. This **represents 15% more carbon**, which would only offset about four years of carbon dioxide under current emission rates.

### Carbon sequestration:

- Carbon sequestration refers to the **process of capturing and storing carbon dioxide (CO<sub>2</sub>)** from the atmosphere and preventing it from being released back into the atmosphere. It **plays a crucial role in mitigating climate change** by reducing greenhouse gas emissions and stabilizing the carbon cycle.
- Carbon sequestration is the **long-term storage of carbon** in various reservoirs, such as forests, soil, oceans, and geological formations, to remove CO<sub>2</sub> from the atmosphere.
- **Natural ecosystems**, such as **forests, wetlands, and oceans**, act as important carbon sinks by absorbing and storing carbon through processes like photosynthesis and biological activity. Preserving and restoring these ecosystems is crucial for enhancing carbon sequestration.
- **Planting new forests (afforestation) or restoring degraded forests** (reforestation) can significantly increase carbon sequestration. Trees absorb CO<sub>2</sub> through photosynthesis, storing carbon in their biomass and in the soil.
- **Agricultural practices and land management** techniques that **enhance soil health**, such as conservation agriculture, agroforestry, and cover cropping, can increase soil organic carbon and sequester significant amounts of carbon.
- **Blue carbon** refers to the **carbon stored in coastal and marine ecosystems**, such as mangroves, seagrasses, and salt marshes. Protecting and restoring these habitats is important for preserving their carbon sequestration capacity.
- **Carbon capture and storage technologies** involve capturing CO<sub>2</sub> emissions from power plants, industrial facilities, and other sources, and then storing it in underground geological formations, such as depleted oil and gas reservoirs or saline aquifers.
- **Direct air capture is a technology** that directly removes CO<sub>2</sub> from the atmosphere using specialized machines. The captured CO<sub>2</sub> can be stored underground or used for various purposes, such as enhanced oil recovery or the production of synthetic fuels.

### Carbon Sinks

- A carbon sink is any **reservoir, natural or otherwise, that accumulates and stores some carbon**-containing chemical compound for an indefinite period and thereby lowers the concentration of CO<sub>2</sub> from the atmosphere.
- Globally, the two most important carbon sinks are **vegetation and the ocean**.
- Public awareness of the significance of CO<sub>2</sub> sinks has grown since **passage of the Kyoto Protocol**, which promotes their use as a form of carbon offset.
- There are also different strategies used to enhance this process. **Soil is an important carbon storage medium**. Much of the organic carbon retained in agricultural areas has been depleted due to intensive farming.
- “**Blue carbon**” designates carbon that is fixed via the ocean ecosystems. **Mangroves, salt marshes and seagrasses** make up a majority of ocean plant life and store large quantities of carbon.
- Many efforts are being made to enhancing natural sequestration in soils and the oceans.
- In addition, a range of **artificial sequestration initiatives** are underway such as **changed building construction materials, carbon capture and storage and geological sequestration**

### 37. Fear of large predators drives mesopredators to safer areas

**Subject: Environment**

**Section: Biodiversity**

### More on the News:



- **Medium-sized carnivorous species — mesopredators** like coyotes or bobcats — tend to move into human-dominated areas to avoid predation by larger carnivores, a phenomenon also known as the “**human shield**” effect.
- But this places the safety-seeking species at considerably greater risk for mortality due to human activities. The findings (Science) describe a “paradox of the lethal human shield” for mesopredators, which has been linked to increased wildlife survival rates in some instances.

### **Mesopredators:**

- Mesopredators are a **group of animals that occupy the middle level in the food chain**, between top predators and their prey. They are **typically medium-sized carnivores** that feed on smaller animals but are themselves preyed upon by larger predators.
- Mesopredators are **carnivorous animals** that are not at the top of the food chain but also not at the bottom. They play an **important role in regulating the populations of their prey species** and can have cascading effects on ecosystem dynamics.
- Some examples of mesopredators include **foxes, raccoons, coyotes, skunks, and small-to-medium-sized wildcats like bobcats and lynxes**. These animals typically have a diverse diet and may feed on a variety of small mammals, birds, reptiles, and invertebrates.
- Mesopredators help **control the populations of their prey species**, preventing them from overpopulating and exerting excessive pressure on their food resources. By regulating prey populations, mesopredators **indirectly influence the abundance and distribution of other species in the ecosystem**.
- In some cases, **when the population of top predators declines** or is removed from an ecosystem, mesopredators can **experience a population increase and become more dominant**. This phenomenon is known as mesopredator release and can have significant ecological consequences.
- Mesopredators can **come into conflict with humans**, particularly in human-dominated landscapes. They **may prey on livestock or become a nuisance in urban areas**. Balancing the needs of human communities and the conservation of mesopredators is an important aspect of wildlife management.

### **38. World Bee Day: Climate change may be causing an apple crisis in Himachal and Kashmir this year; here's how**

**Subject :Environment**

**Section: Biodiversity**

**Context:** Climate change is causing bees, among nature's primary pollinators, to die in Himachal Pradesh and the Kashmir Valley

**Concept:**

- Almost 100 per cent of apple growers in Kashmir use bees for pollination.
- A study by Tamil Nadu Agricultural University shows that **pollination from bees increased apple production by 44 per cent**.
- Two species are used for large and commercial pollination in India. They are **Apis mellifera or the Italian bee and the Apisceranaindica or the Indian bee**. Of these, Apis mellifera is mostly used as it is much larger than Apiscerana.
- **Cerana usually flies less than a kilometre while the Italian bee flies up to six kilometers. Cerana flies at temperatures between 16 and 21 degrees Celsius and low light**, while mellifera flies at temperatures between 21 and 25 degrees Celsius.
- **mellifera is more agile than native bees. It reaches 25 to 30 flowers in a minute**. Because of this, this bee also does the pollination process faster.
- Apiscerana goes from one flower to another in three to four seconds and can pollinate only 20 flowers in a minute.
- **Mellifera bees were first brought to India in 1962 and reared in Nagrota, Himachal Pradesh**. Since then, they have been used to promote horticulture in the state.
- Italian bees have proved to be very helpful in fruit pollination, **the increase in its numbers are also result in gradual decline in the number of native bees**

**Reasons for the decrease in the number of naturally occurring insects:**

- Clearing of forests for farming and horticulture
- decrease in the habitat and plants which supply food to these insects
- the indiscriminate use of pesticides



- change in weather

### What is Pollinator?

- **A pollinator is anything that helps carry pollen from the male part of the flower (stamen) to the female part of the same or another flower (stigma).**
- The movement of pollen must occur for the the plant to become fertilized and produce fruits, seeds, and young plants.
- Some pollinators, including **many bee species, intentionally collect pollen. Others, such as many butterflies, birds and bats move pollen accidentally.**

### Additional Info:

#### Apple:

- Apple (*Malus pumila*) is commercially the most important temperate fruit and is fourth among the most widely produced fruits in the world after banana, orange and grape.
- **China is the largest apple producing country in the world.**
- Apples **originated in the Middle East** more than 4000 years ago
- It is **mostly grown in the states of Jammu & Kashmir, Himachal Pradesh, Uttaranchal, Arunachal Pradesh and Nagaland**
- Apple can be grown at **altitudes 1,500-2,700 m. above m.s.l**
- The temperature during the growing season is around 21-24°C. For optimum growth and fruiting, apple trees need 100-125 cm. of annual rainfall, evenly distributed during the growing season
- **Loamy soils, rich in organic matter with pH 5.5 to 6.5** and having proper drainage and aeration are suitable for cultivation.
- **Dry temperate areas are suitable for apple cultivation.**
- India's share in the total world apple production is merely 2.05 per cent. Only around 1.6% of the country's production gets exported.

#### World Bee Day

- It is celebrated on May 20. On this day Anton Janša, the pioneer of beekeeping, was born in 1734.
- The purpose of the international day is to acknowledge the role of bees and other pollinators for the ecosystem
- The UN Member States approved Slovenia's proposal to proclaim 20 May as World Bee Day in December 2017

### 39. G7's climate Wishlist, and the realities of efforts to cap warming

#### Subject :Environment

#### Section: International conventions

#### Context:

The G7 summit, hosted by this year's Japanese G7 presidency, takes place in Hiroshima City, Japan from 19-21 May.

#### G7 climate commitments:

- The G7 stressed on the need for a **global peak in emissions by 2025.**
- The G7 — the US, the UK, Germany, Italy, Japan, France and Canada — claimed that their emissions had already “peaked”, and asked all “major economies” to ensure that their individual emissions do not continue to rise beyond 2025.
- **Major economies” is not defined**, but in the context of climate change, it usually includes countries like India, China, Brazil, South Africa, and Russia, each of which is a significant emitter
- **The 2025 peak year is not mandated under the Paris Agreement or any other international decision**
- Global peak of greenhouse gas emissions by 2025 is not implausible. The biggest emissions year so far has been 2019 — about 55 billion tonnes of carbon dioxide equivalent
- Estimates from UN Climate Change suggest that if all countries took only those measures that they have promised so far, emissions in 2030 would be about 11% higher than 2010 levels.
- **The G7 reiterated its commitment to turn net-zero by 2050**, and asked all ‘major economies’ to attain net-zero status by that year and to come up with detailed road maps to reach the target
- But Scientist says that the world as a whole must become net zero by mid-century in order to meet the 1.5 degree Celsius target.
- **China has said it would turn net-zero only in 2060, while India has set 2070 as the target. Some other countries, including big emitters like Russia and Saudi Arabia, have 2060 as their net-zero targets**

- The G7 **countries put no deadline to ending the use of fossil fuels**, only saying that they were committed to accelerating the phase-out of “unabated fossil fuels” in line with 1.5 degree Celsius trajectories
- **Unabated” is not clearly defined; they also said they would eliminate “inefficient fossil fuel subsidies” by 2025 or earlier, without defining “inefficient subsidies”.**
- The G7 also claimed they had **stopped financing new fossil fuel-based energy projects “except in limited circumstances”**

#### The G-7:

- The G-7 or ‘Group of Seven’ are **Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.**
- The G-7 nations meet at annual summits that are presided over by leaders of member countries on a rotational basis. The summit is an informal gathering that lasts two days, in which leaders of member countries discuss a wide range of global issues.
- The G-7 does **not have a formal constitution or a fixed headquarters.**
- The decisions taken by leaders during **annual summits are non-binding.**
- It is an intergovernmental organisation that was **formed in 1975** by the top economies of the time as an informal forum to discuss pressing world issues.
- Canada joined the group in 1976, and the European Union began attending in 1977.
- The G-7 was known as the ‘G-8’ for several years after the original seven were joined by Russia in 1997. The Group returned to being called G-7 after Russia was expelled as a member in 2014 following the latter’s annexation of the Crimea region of Ukraine.

#### 40. Guardians of the Ganga: task force keeps a watchful eye on the river

##### **Subject : Environment**

##### **Section: Pollution**

##### **Context:**

Over 4,000 volunteers under the NamamiGange initiative have been keeping a check on littering and poaching in the river to make sure that its flora, fauna are intact; in return, the Wildlife Institute of India has helped them with livelihood training

##### **Concept:**

##### **NamamiGange Programme:**

- It an Integrated Conservation Mission, approved as a ‘Flagship Programme’ in June 2014.
- It seeks to accomplish the twin objectives of effective abatement of pollution and conservation and rejuvenation of National River Ganga.
- It is being operated under Ministry of Jal Shakti.
- The program is being implemented by the National Mission for Clean Ganga (NMCG), and its state counterpart organizations i.e., State Program Management Groups (SPMGs).
- NMCG is the implementation wing of National Ganga Council (set in 2016; which replaced the National Ganga River Basin Authority (NRGBA).
- National Ganga Council (NGC) was Created in October 2016 under the River Ganga (Rejuvenation, Protection and Management) Authorities Order, 2016. It is **Headed by Prime Minister.**
- It has a Rs. 20,000-crore, centrally-funded, non-lapsable corpus and consists of nearly 288 projects.
- Main Pillars of the NamamiGange Programme are:
  - Sewerage Treatment Infrastructure
  - River-Surface Cleaning
  - Afforestation
  - Industrial Effluent Monitoring
  - River-Front Development.

The United Nations in **December 2022 recognised the initiative as one of the top 10 World Restoration Flagships involved in reviving the natural world**

##### **Ganga Prahari**

- This is a **task force of volunteers** constituted by the **National Mission for Clean Ganga and the Wildlife Institute of India (NMCG-WII) under the NamamiGange programme**

- The concept of the *Ganga Prahari* was mooted by Ruchi Badola, the dean at WII and nodal officer of the **Biodiversity Conservation and Ganga Rejuvenation project**.
- The task force, which now has over 4,000 volunteers in 100 districts across Uttarakhand, Uttar Pradesh, Jharkhand, Bihar, and West Bengal, keeps a check on river protection, preventing people from littering, as well as reports poaching.

#### 41. Antarctic sea ice cover hits many record lows

**Subject : Environment**

**Section: Climate Change**

**Concept :**

- A recent report indicates that the extent of sea ice in Antarctica has reached its lowest recorded level. The concerning trend continues, as global temperatures rise, leading to a reduction in sea ice cover.

#### **Antarctica Ice Cover Status**

- Antarctica experiences a cycle where sea ice melts during its summer season, occurring from approximately October to March, and subsequently freezes again during the winter months.
- Although ice sheets in Antarctica undergo seasonal melting every summer, the extent of the record-breaking drop observed this year surpasses previous minimum levels.
- Specifically, on February 19, 2023, the Antarctic sea ice extent reached a historic low of 1.76 million square kilometers.

#### **Ice cover decline: Key data**

- **Square km decline**
- The **European Union's Copernicus Climate Change Service (C3S)** provided the figures, highlighting the significant decrease in Antarctic sea ice.
- On February 16, the ocean surface covered by ice around Antarctica shrank to 2.09 million square kilometers (800,000 square miles), the lowest level since satellite records began.
- **Warming trends**
- Both the North and South poles have experienced significant warming, with temperatures rising by approximately 3 degrees Celsius compared to late 19th-century levels, three times the global average.
- Arctic sea ice has been diminishing by about 3 percent per year since the late 1970s, while sea ice in Antarctica has remained relatively constant with large annual variations.
- **Regional variances and vulnerabilities**
- Recent ice cover reduction during the southern hemisphere summer has been most pronounced in West Antarctica, which is more vulnerable to the impacts of global warming compared to East Antarctica.
- Antarctica witnessed its first recorded heatwave in 2020, with temperatures 9.2 degrees Celsius above the mean maximum. Unusual temperature spikes have been observed in various parts of Antarctica.
- The Arctic has also experienced significant declines in sea ice, with the record minimum sea ice extent occurring in 2012.

#### **About C3S**

- The **Copernicus Climate Change Service (abbreviated as C3S)** is one of the six thematic services provided by the European Union's Copernicus Programme.
- **Copernicus is the European Union's Earth Observation Programme.** It consists of a complex set of systems that collect data from multiple sources: earth observation satellites and in situ sensors, such as ground stations, airborne and sea borne sensors.
- Copernicus processes these data and provides users with information through a set of services that address six thematic areas: land, marine, atmosphere, climate change, emergency management and security.
- The Copernicus Climate Change Service provides authoritative information about the world's past, present and future climate.
- The freely accessible high-quality data, tools and information help businesses, scientists and policymakers to mitigate and adapt to the effects of climate change.

#### 42. Small cats in big trouble: Why we need to save these elusive endangered species

**Subject: Environment**

**Section: Species in news**

### Context:

- In Scotland, the population of the country's **wildcats (Felissilvestrisilvestris)** has dwindled so much they're now considered **functionally extinct**.

### Details:

- There are **fewer than 30 Scottish wildcats**, also known as the **Highland tiger**, left in the wild.
- Conservationists are rushing to save the species through a reintroduction programme set to kick off later this year.
- A combination of **habitat loss, persecution and hybridisation with domestic cats** drove the species to its current crisis point.
- It can be seen as a **possible indicator of looming ecosystem collapse**: The **United Kingdom** is one of the most nature-depleted places on Earth.

### Small cats:

- Small cats range in size from **South Asia's diminutive rusty-spotted cat** (*Prionailurus rubiginosus*), which, at 0.8-1.6 kilograms (1.8-3.5 pounds), is the **world's smallest wild felid**; to the far larger **two species of clouded leopard** (*Neofelis diardi* and *N. nebulosa*). Weighing in at up to 23 kg (50 lbs), clouded leopards are often referred to as **modern-day saber-toothed tigers** and ambiguously classified as "**big small cats**" by some or "**small big cats**" by others.
- Their habitats range from **deserts and savanna grasslands to tropical and temperate forests, enlivening alpine heights and low coastal wetlands** as well as **human-dominated agricultural landscapes**.
- In south Asia these small cats mostly prey on rodents, so maintaining "biological pest controllers" of this kind can enable farmers to reduce the use of harmful chemical pesticides and cut agricultural costs.
- **Threats include:**
  - habitat loss and fragmentation,
  - persecution due to human-wildlife conflict,
  - climate change,
  - diseases spread by domestic animals,
  - the risk of becoming road kill and
  - pollution including plastics ingestion in some cases.
- **Conservation status:**
- Of the more than **30 small cat species**, a **dozen** are currently considered threatened or **endangered by the IUCN**, including
  - the African golden cat (*Caracal aurata*),
  - Andean cat (*Leopardus jacobita*),
  - Borneo bay cat (*Catopuma badia*),
  - Black-footed cat (*Felis nigripes*),
  - Chinese mountain cat (*F. bieti*),
  - fishing cat (*P. viverrinus*),
  - Flat-headed cat (*P. planiceps*),
  - Guinea (*L. guinea*),
  - the northern and southern tiger cat (*L. tigrinus* and *L. guttatus*) and
  - both species of clouded leopard.

### About the Highland Cat (Felissilvestrisilvestris):

- The **European wildcat (Felissilvestris)** is a small wildcat species native to continental Europe, Scotland, Turkey and the Caucasus.
- It inhabits forests from the **Iberian Peninsula, Italy, Central and Eastern Europe** to the **Caucasus**.
- Its fur is brownish to grey with stripes on the forehead and on the sides and has a bushy tail with a black tip.
- It reaches a **head-to-body length** of up to 65 cm (26 in) with a 34.5 cm (13.6 in) long tail, and weighs up to 7.5 kg (17 lb).
- In **France and Italy**, the **European wildcat** is predominantly **nocturnal**, but also **active in the daytime** when undisturbed by human activities.
- It **preys** foremost on **small mammals** such as **lagomorphs and rodents**, but also on **ground-dwelling birds**.

### Role in the ecological system:

- The Highland cat, along with small cats plays a **key ecological role** by **controlling small mammal populations** in their **natural habitats**.
- Many cats, though maligned, also **aid farmers by reducing rodents**.
- In Scotland, the **cat's return could also boost local economies** through activities such as wildlife observation and ecotourism.

#### About Fishing cats

- **Scientific Name :** (Prionailurusviverrinus)
- **Description :** Fishing cats are almost twice the size of the house cat.
- The fishing cat is an adept swimmer and enters water frequently to prey on fish as its name suggests.
- The fishing cat is nocturnal and apart from fish also preys on frogs, crustaceans, snakes, birds, and scavenges on carcasses of larger animals.
- **Habitat :**
  - They occur in wetlands like marshlands, mangroves and flooded forests in major South and Southeast Asian River basins starting from Indus in Pakistan till Mekong in Vietnam and in the island nations of Sri Lanka and Java.
  - In India, fishing cats are mainly found in the mangrove forests of the Sundarbans, on the foothills of the Himalayas along the Ganga and **Brahmaputra River** valleys and in the Western Ghats.
- **Conservation Status:** IUCN Red List :Endangered
- The Convention on International Trade in Endangered Species (CITES) lists the fishing cat on Appendix II part of Article IV of CITES, which governs international trade in this species.
- In India, the fishing cat is included in Schedule I of the Indian Wildlife (Protection) Act, 1972 and thereby protected from hunting.

#### 43. The hidden side of human-elephant conflicts: orphaned calves

##### Subject: Environment

##### Section: Species in news

##### Context:

- Negative interactions between elephants and humans have been reported from the Eastern Ghats region for many years now.

##### Details:

- Between 2016 and 2023, unofficial records put elephant deaths by way of electrocution and gunshots in Hosur forest division in Tamil Nadu, at 14.
- The Tamil Nadu government has come up with stricter measures to curb electrocution incidents of wildlife.

##### Human-elephant conflict:

- **Only 22 per cent** of **elephant habitat** is found within our protected area network – the remaining elephant range lies outside, in places now overrun by people.
- The estimated **28,000 wild elephants** in India are distributed over **about 3%** of the country's geographical area.
- An **average of 350 people** have been killed annually over the last five years (2006–10) in the conflict with elephants.
- Elephants damaged an average of 330 sq km of crops annually for the last three years (2008–10).
- The **Central and State Governments** together spend 10 to 15 crore rupees every year on controlling elephant depredation and paying ex-gratia to affected people.
- 40 – 50 elephants are killed annually while crop-raiding.
- **Elephant-human conflict** is a result of **habitat loss and fragmentation**.
- When the mother elephant dies, the herd or the clan may accept the calf. Families of elephants form a herd and multiple herds form a clan.
- Calves younger than two years are heavily dependent on their mothers. They are breastfed 12-14 times a day which makes the separation equally painful for both the mother and the calf.

##### Action taken to prevent human-elephant conflict:

- In March 2023, the **Ministry of Environment, Forest and Climate Change (MOEFCC)** released **14 guidelines** for **human-wildlife conflict mitigation** to promote harmonious coexistence between humans and

wildlife with a section on **managing orphaned/stray elephant calves-in-conflict**, covering aspects such as the stress, immunity and hygiene of the calves.

- The government is working on securing continuous migratory paths for elephants so that interactions with humans can be minimised.
- Illegal tapping from the electricity board (EB) poles is a criminal act that warrants stringent action by the government.
- In cases of **separation from herds**, the immediate response of the forest department is to find opportunities to unite the calf with its herd.
- 10 calves below the age of one were rescued since **1971** of which seven have survived and are lodged at **Theppekadu elephant camp**.

#### **Financial arrangements:**

- The **cost of taking care of these calves is borne by the forest department**.
- Care takers, calf rearing shed, medicines, milk replacers/ feed are the major expenses.
- In the camps set up by the **forest department**, caretakers and sheds are already there.
- So, the feeding cost and medicine are the extra expenses needed. This is also covered by existing regular medicine and feed funds. The only additional cost is for the milk replacer given to calves below two years.

#### **44. Plastic-free planet: Negotiations on Global Plastics Treaty underway**

##### **Subject: Environment**

##### **Section: Species in news**

##### **Context:**

- On May 29, 2023, members of the **United Nations Environment Programme (UNEP)** gathered in **Paris** for the **second meeting of the Intergovernmental Negotiating Committee (INC) on Plastic Pollution**, also known as INC-2.

##### **Details:**

- **INC-2**, a successor of **INC-1**, held in **Punta del Este, Uruguay**, last year, is the international community's chance set the stage for negotiations on a global deal to end plastic pollution.

##### **INC-1**

- The Uruguay round was the first formal meeting of the body tasked with preparing the future legal instrument on plastics. The meeting focused on the administration and organisation of the negotiating body, including the election of a bureau and adoption of the rules of Procedure (a document that sets forth the 'rules' on how the committee will operate and is critical to the long term success of the negotiations and the treaty. INC-1 ended without any resolution.

##### **INC-2**

- In the INC-2 meeting- apart from the plenary where member states make general statements, two parallel contact groups have been established. Contact group 1 will focus on the treaty's objectives and core obligations, including control measures and voluntary actions. While contact group 2 will focus on the implementation measures and means of implementation.

##### **Major stakeholders:**

- Apart from the member states, there are nine major groups and stakeholders: Non-profits, women, workers and trade unions, the scientific community, farmers, indigenous communities, children and youth, local authorities, businesses and industry.
- **Accredited organisations and their role in negotiations:**
  - **Accredited organisations can also be observers in UNEP meetings.**
  - **Observer status is a privilege granted to non-members** to allow them to participate in the organisation's activities.
  - **Observers are not allowed to make interventions during the process of the negotiations.**
  - However, the observers are seen as agencies that can influence the priorities and decisions taken by certain member states.
- **Open-ended working group (OEWG):**
  - In **UNEA resolution 5/14**, the assembly mandated an ad hoc open-ended working group (OEWG) to lay the groundwork for negotiations.



- One of the key tasks of the OEWG was **establishing Rules of Procedure which govern INC**.
- In the **INC-2 meeting** — apart from the plenary where member states make general statements, **two parallel contact groups** have been established.
- **Contact group 1** will focus on the **treaty's objectives and core obligations**, including control measures and voluntary actions.
- While **contact group 2** will focus on the implementation measures and the means of implementation.

#### **Go circular to end plastic pollution:**

- The report, tilted **Turning off the Tap: How the world can end plastic pollution and create a circular economy**, has been launched by the UNEP.
- **Global plastic pollution can reduce by 80 per cent by 2040** if countries and companies make deep policy and market shifts using existing technologies and shift to a circular economy.
- Countries need to make **three market shifts** — reuse, recycle, and reorient & diversify.
- Even with such measures, **100 million tonnes of plastics from single-use and short-lived products** will still need to be **safely dealt with annually by 2040** — together with a significant legacy of existing plastic pollution.

#### **Suggestions of the report:**

- Setting and implementing design and safety standards for disposal of non-recyclable plastic waste, and making manufacturers responsible for products shedding microplastics, among others.
- The report also highlighted that the highest costs in both a throwaway and circular economy are operational.
- **Extended Producer Responsibility (EPR)** schemes can cover these operational costs of ensuring the system's circularity through requiring producers to finance the collection, recycling and responsible end-of-life disposal of plastic product.
- The report recommended a **global fiscal framework could be part of international policies** to enable recycled materials to compete on a level playing field with virgin materials, create an economy of scale for solutions, and establish monitoring systems and financing mechanisms.

#### **Benefits of shifting to a circular economy:**

- It would result in **\$1.27 trillion in savings**, considering costs and recycling revenues.
- A further **\$3.25 trillion** would be saved from avoided externalities such as health, climate, air pollution, marine ecosystem degradation, and litigation-related costs.
- This shift could also result in a **net increase of 700,000 jobs by 2040**.
- Investment costs for the recommended systemic change are significant, but below the spending without this systemic change: \$65 billion per year as opposed to **\$113 billion per year**.
- Much of this can be mobilised by shifting planned investments for new production facilities or a levy on virgin plastic production into the necessary circular infrastructure.

#### **45. Problems in Cheetah reintroduction**

##### **Subject : Environment**

##### **Section: Species in news**

##### **Context:**

- 3 adult Cheetahs and 3 new born Cheetah cubs in KunoPalpur have died in the last few months due infighting, disease etc.
- **Cause of deaths**
- 20 cheetahs have been introduced in KunoPalpur, which has a geographical area of 750 sqkm, bringing cheetah density to 3 per 100 sq km, while studies in Africa reveal that optimum cheetah density should be 1 per 100 sqkm. This has led to infighting for food and mate and resulted in death of a female. Moreover, females those have been brought up in wild fencing and lack experience of motherhood, that's why cub mortality is also high. According to Cambridge study 66% deaths occur due to predation, 16% due to abandonment by Cheetah mothers.
- **Way forward**
- Even half of 20 cheetahs surviving first year can be a success, still due to high density of cheetahs, future batches of cheetahs should be located in other protected areas like Mukundra hills nearby to Kuno, and in India the model of fenced raising of Africa should be avoided as ,we follow a model of coexistence with species.

## 46. Gharial conservation in Odisha

### **Subject :Environment**

#### **Section: Species in news**

##### **Context:**

- Forest officials have spotted around 35 hatchlings of the gharial (*Gavialis gangeticus*), a crocodile species, at the Satkosia gorge in the Mahanadi river in Odisha's Angul district. The species is unique to the Indian subcontinent and is critically endangered. This is the third consecutive year of successful breeding of these reptiles in natural habitat in the freshwater of the Mahanadi River.
- **Measures for successful breeding**
- Successful breeding of the gharial in the **Satkosia gorge** is attributed due to the strict prohibition on fishing up to 9 km downstream of the river., CCTVs and round the clock monitoring and spreading awareness among 300 villages in the area.
- **About Gharial**
- The gharial is listed in Schedule 1 of the Wildlife protection act, 1972 and also described as critically endangered on the International Union for Conservation of Nature Red list of Threatened Species.
- Their habitat is threatened because of human encroachment, river pollution and fishing activities. Gharials caught accidentally in fishing nets are either hacked to death or have their snout chopped off by fisherman.

## 47. Gangetic dolphins

### **Subject :Environment**

#### **Section: Species in news**

##### **Context:**

- Two Gangetic dolphins were found dead in Bihar in three days.

##### **Details:**

- The dolphins were found dead at the **Sangat Ghat (bank of river Ganga) near Aunta** in Mokama, about 90 km from Patna.
- Both Gangetic dolphins were killed due to the **ongoing mechanised dredging to deepen the riverbed**.

##### **About Gangetic dolphins:**

- The **Ganges river dolphin (Platanista gangetica)** is a species of **toothed whale** classified in the family **Platanistidae**.
- It lives in the **Ganges** and related rivers of **South Asia**, namely in the countries of **India, Nepal, and Bangladesh**.
- It is related to the much smaller **Indus river dolphin** which lives in the **Indus River** in **Pakistan** and the **Beas River** of **northwestern India**.
- It is also known by the name **susu** (popular name) or "**Sisu**" (Assamese language) and **shushuk** (Bengali).
- The **Ganges river dolphin** has been recognized by the **Government of India** as its **National Aquatic Animal** and is the **official animal of the Indian city of Guwahati**.
- Its first occurrence, within the **Hooghly River**, was **documented by William Roxburgh**.
- The **Gangetic river dolphin is one of four freshwater dolphin species worldwide**.
- The **other three** are found in the **Yangtze River in China** (now extinct), the **Indus River in Pakistan** and the **Amazon River in South America**.

##### **Threats:**

- Dolphins are frequently targeted by poachers for their skin and oil. There is a huge demand for this mammal's meat and fat.
- Other threats include:
  - Natural habitat destruction
  - Fishing and poaching
  - Dredging and large-scale construction of dams
  - Large-scale vessel movement and related pollution
  - Oil spills and other river pollutants
  - Lack of prey base due to large-scale fishing, entangled in fishing net, etc.

##### **Characteristics:**

- It is **blind** and finds its way and prey in river waters through **echolocation**.
- Ganges river dolphins use **echolocation to find food**. They eat **crustaceans** such as **prawns and fish including carp, mahseer, and even sharks** such as the **Ganges shark (Glyphis gangeticus)**. They may also take birds and turtles.
- **Bihar is home to around half of India's estimated 3,000 Gangetic dolphins.**

#### Protection status:

- Gangetic dolphin is protected under **Schedule I of the Wild Life (Protection) Act (WPA), 1972.**
- Under **WPA**, special instructions are provided on how to deal with Schedule I animals.
- There are provisions for a **three-year jail term** and a **fine of Rs 3,000-25,000 for possessing any body part of an animal listed in Schedule I.** The forest officials are accountable and responsible for this.
- **IUCN red list:** Endangered


#### Role in the ecosystem:

- The presence of dolphins was a sign of a healthy riverine ecosystem.
- Dolphins prefer water that is at least five-eight feet deep.
- They are usually found in turbulent waters, with enough fish for them to feed on.
- Gangetic dolphins live in zones with little or no current, which helps them save energy. On sensing danger, they can dive into deep waters.
- The dolphins swim from the no-current zone to the edges to hunt for fish and return, Sharma recalled.

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## Geography

### 1. Lithium Industry of Chile

#### **Subject: Geography**

#### **Section: Economic geography**

#### **News in Brief**

- Chile Government plans to take a majority stake in the country's lithium industry.
- A state-run lithium company will be set up to take control from private players.
- Any new lithium contracts will only be issued as public-private partnerships with state control.
- The two current contracts will not be terminated. They are with two big lithium producers, the local company SQM (till 2030) and the United States-based Albemarle (till 2043). Government may also try to boost state participation in the operations of these companies.
- Some experts call this as "nationalization" of Lithium industry. Some call its quasi-nationalization with playing field being levelled in favour of the state.

#### **About Chile**

- It is a South American Country
- It has the world's second-biggest producer of **lithium** and has the largest reserves
- Chile's constitution defines lithium as a strategic and exclusively state-owned mineral, because of its possible use in nuclear fusion.

#### **About Lithium**

- Referred to as "**white gold**"
- Used in rechargeable **batteries that power laptops, mobile phones**
- Used in rechargeable batteries to **power electric vehicles (EVs)**, which is a crucial part of the world's plan to tackle climate change.

#### **Why Chilean Government wants Majority stake in Lithium Industry?**

##### **To boost Chile's economy**

- As countries transit to green energy, demand for lithium rise.
- Chile struggles to keep up with the demand and fell to the 2<sup>nd</sup> position in the list of largest lithium producers, taken over by Australia.
- State-run lithium company will "promote, expand and control" the lithium industry and prevent Chile from falling to the 3<sup>rd</sup> position in 2028 (as predicted by JPMorgan)
- Chilean President wants to set up the lithium company on the lines of Codelco, a Chilean government-owned mining company which is now the world's largest copper producer.

##### **To protect Chile's Environment**

- The **brine evaporation method used in current production consumes vast amounts of water.**
- **Water is already scarce especially in the Atacama Desert** – most of the lithium reserves are located.
- Widely criticized by **local indigenous groups and environmentalists**
- Lithium (Li) mining has damaged Chile's biodiversity – a 2022 study – Li Mining led to decline in the number of flamingos in the area. Water becoming scarce in Atacama, fewer flamingos are reproducing, impacting herd numbers
- Future mining projects to involve consultation with local communities to protect the salt flats

#### **Brine Evaporation Method**

Lithium brine recovery is a straightforward but time-consuming process. Salt-rich water is pumped to the surface and into a series of evaporation ponds. Over a period of months, the water slowly evaporates and a variety of salts precipitate out, leaving a brine with an ever-increasing concentration of lithium.

#### **Salt Flats**

- A salt flat is a natural landscape in which a large area of flat land is covered by salt.
- World's most well-known salt flat is the Salar de Uyuni in Bolivia – largest in the world and also contains more than half of the planet's lithium reserves.
- A salt flat forms from a natural water body whose recharge rate is lower than the evaporation rate.

- Over time, all the water evaporates, leaving behind the dissolved minerals, usually salts. They reflect sunlight strongly and thus appear bright.
- The underlying soil is highly saline — even if the water table is shallow. The groundwater is too salty for humans to drink.

### Salt Flats of Chile

Atacama **Salt Flat** is the biggest salt deposit in **Chile**. It has a rough white surface below which there is a large Salt Lake. It is surrounded by mountains, and has no drainage outlets. In the east it is enclosed by the main chain of the Andes, while to the west lies a secondary mountain range of the Andes called Cordillera de Domeyko. The lake under the salt flat has one of the largest lithium reserves in the world.

### Challenges Involved

- Getting it approved by Congress, where the President's party doesn't have a majority, and would need the support of Opposition parties
- Creation of a state-run lithium company could take years for the government.
- Codelco could take years to implement the proposal as it doesn't have any experience in lithium mining.
- National elections in 2025 could also impact the negotiations between the private players and the government.

## 2. Kuki Tribes

### Subject : Geography

### Section: Tribes in news

#### News in Brief

A land survey led to violence in Manipur's Kuki-dominated Churachandpur. Tribal bodies, particularly the Kukis, are unhappy with a land survey being conducted by the state as they fear eviction. They claimed to continue non-cooperation against the government until it nullifies the 1966 government order declaring tribal areas as protected/reserved forests.

#### Kuki Tribes

The Kukis are an ethnic group of multiple tribes inhabiting the North-Eastern states of India—**Manipur, Mizoram and Assam**; parts of Burma (now Myanmar), and Sylhet district and Chittagong hill tracts of Bangladesh. '**Mimkut**' is the main festival of the Kuki tribe. In Manipur, the various Kuki tribes, living mainly in the hills, currently make up **30% of the total population**. While **Churachandpur is their main stronghold**, they also have a sizable population in Chandel, Kangpokpi, Tengnoupal and Senapati districts.

The **Chin-Kuki group** consists of Gangte, Hmar, Paite, Thadou, Vaiphei, Zou, Aimol, Chiru, Koirang, and many others. The term **Chin** is used for the people in the **neighboring Chin state of Myanmar** whereas **Chins are called Kukis in the Indian side**. While Kuki is not a term coined by the ethnic group itself, the tribes associated with it came to be generically called **Kuki under colonial rule**.

#### Churachandpur-Khoupum Protected Forest

Spread across three districts of Churachandpur, Bishnupur, and Noney. Notified under Section 29 of the Indian Forest Act, 1927 by the Government of Manipur with a well-defined schedule of boundaries.

#### Tribe Related Constitutional Provisions and Laws

- Article 46 of DPSP – educational and economic interests of vulnerable sections
- Provisions of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 protect the land resource interests of tribals.
- Under Fifth Schedule, transfer of tribal land to private parties for mining can be declared null and void.
- Under Panchayats (Extension to the Scheduled Areas) Act, 1996 or PESA Act Gram Sabha has the right to mandatory consultation in land acquisition, resettlement and rehabilitation of displaced persons, ownership of minor forest products, prevention of land alienation, etc.

#### Section 144 of CrPC

It is meant for emergency situations. It empowers a **district magistrate, a sub-divisional magistrate**, or any **other executive magistrate** empowered by the state government, to issue orders to prevent and address urgent cases of apprehended **danger or nuisance**. It **prohibits the gathering of four or more people** in the concerned area, while during curfew people are instructed to stay indoors for a particular period. The government puts a **complete restriction on traffic** as well.



### 3. Bodo and Karbi to Dimasas – Tribal Insurgency

#### Subject : Geography

#### Section: Tribes in news

#### Why in news?

The government signed a peace settlement with the Dimasas National Liberation Army (DNLA). It is expected to mark the end of tribal insurgency in Assam.

#### Claims for Autonomy or Statehood in Assam

Nagaland (1963), Meghalaya (1969), Mizoram (1986) and Arunachal Pradesh (1987) were carved out from Assam due to demands for greater political autonomy, primarily through statehood demands.

Bodos (35% of Assam's population) were claiming autonomy since 1960s. Three accords were signed with Bodo militant groups in 1993, 2003, and 2020. The 1993 accord paved the way for the Bodo Land Autonomous Council. The 2003 Accord led to the formation of Bodo Territorial Council (BTC), with jurisdiction over Bodo Territorial Autonomous District (BTAD).

The insurgency by Karbi groups- demand for an autonomous state, taken off in the 1980s. Greater autonomy and special packages for the Karbi Anglong Autonomous Council were provided. Dimasas groups also claimed autonomy in Assam.

#### Autonomous Hill Development Council:

- Established under **Sixth Schedule** of Indian Constitution for the administration of tribal areas in **Assam, Meghalaya, Tripura and Mizoram**.
- **Article 244 (2) and Article 275 (1)** of the Constitution.
- To safeguard the rights of the tribal population in these states.
- **Governor** is empowered to increase or decrease the areas or change the names of the autonomous districts.
- Fifth schedule areas – executive powers of the Union will apply; But **Sixth schedule areas** – within **executive authority of the state**.
- Fifth schedule – administration and control of scheduled areas and scheduled tribes in any state except the four states of Assam, Meghalaya, Tripura and Mizoram. These 4 states are administered under sixth schedule.
- The **acts of Parliament or the state legislature** do not apply to autonomous districts and autonomous regions or apply with specified modifications and exceptions.
- The Councils have also been endowed with **wide civil and criminal judicial powers**, for example establishing village courts etc. However, the jurisdiction of these councils is **subject to the jurisdiction of the concerned High Court**.

In Assam – Hill districts of **Dima Hasao, Karbi Anglong** and West Karbi and the Bodo Territorial Region are under Sixth Schedule.

#### Bodos

Bodo Tribal Community of Assam is considered as the **earliest immigrants of Assam** and mainly concentrated in **Brahmaputra valleys**. It is the **largest minority group of the state**. It is believed to have arrived in Assam **from Tibet** through Bhutan passes. As the primitive settlers of Assam valley, the Bodo community is considered to be the most traditionally and culturally rich community of the state. For writing they used **Roman script and Assamese script**. Now they have taken up the **Nagari script** for their writing. Their rich culture incorporates elements like dancing, singing etc. which reflects the fact that they have many religious practices and beliefs, among which **Bathouism** has special importance. This community is very fond of conventional drinks called **Zu mai**. "**Baishagu**" is the main festival of Bodo community. It is celebrated during the month of April every year.

#### Karbis

Karbis are an ethnic tribal group scattered in North East India with a **concentration in Assam**. Once they were believed to have lived on the **banks of the rivers the Kalang and the Kopili and the entire Kajiranga area**. Racially the Karbis belong to the **Mongoloid** group and linguistically they belong to the **Tibeto-Burman** group. **Domahi** is celebrated in the months of March-April. It is a festival of thanks giving to the almighty **Hemphu**, the traditional god head of the Karbi Household.

#### Dimasas

The major population of Dimasas is residing in the hill district of **Dima Hasao** (erstwhile North Cachar Hills) and in scattered numbers in the districts of **Karbi Anglong**, **Nagaon** and also in the **Barak valley area**. They are also

settled in Nagaland. The language spoken by the Dimasas belongs to the **Tibeto- Burman** linguistic group. **Busu festival** is observed in relation to the harvesting period of their **jhum cultivation**. It is the time for merry making and relaxation after months of hard work.

#### 4. Mocha: Summer cyclones not new; Fani, Amphan were May storms too

#### **Subject : Geography**

#### **Section: climatology**

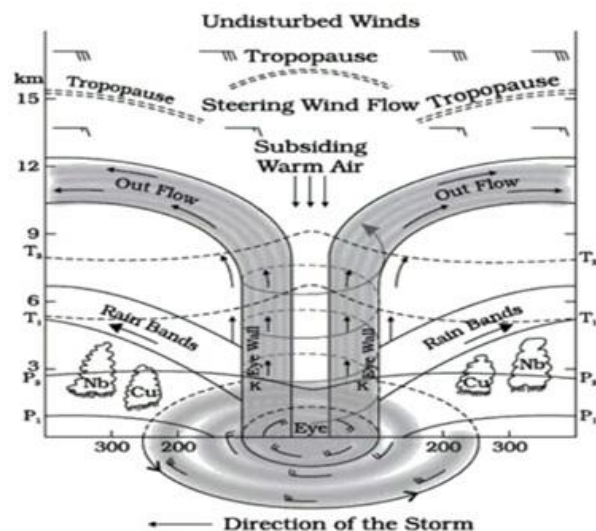
#### **Context:**

A summer cyclone is likely to take place in the Bay of Bengal around May 8, called Mocha. India has seen a few major cyclones in the Bay of Bengal during April and May in the last few years.

However, according to data from the India Meteorological Department (IMD), October and November constitute the peak cyclone season for India.

#### **Concept –**

- A tropical cyclone is **an intense circular storm that originates over warm tropical oceans** and is characterized by low atmospheric pressure, high winds, and heavy rain.
- A **characteristic feature** of tropical cyclones is the **eye**, a central region of clear skies, warm temperatures, and low atmospheric pressure.
- Storms of this type are called **hurricanes** in the **North Atlantic and eastern Pacific** and **typhoons** in **South-East Asia and China**. They are called **tropical cyclones** in the **southwest Pacific and Indian Ocean** region and **Willy-willies** in north-western
- Storms **rotate counter-clockwise** in the **northern hemisphere** and **clockwise** in the **southern**



**Fig: Vertical section of the tropical cyclone**

The **conditions favourable** for the **formation and intensification** of tropical storms are:

- **Large sea surface** with **temperature higher than 27° C**.
- Presence of the **Coriolis force**.
- Small variations in the **vertical wind speed**.
- A pre-existing weak **low-pressure area** or **low-level-cyclonic circulation**.
- **Upper divergence** above the sea level system.

**Some of the other recent summer cyclones that hit India**

#### **Cyclone Fani, May 2019**

Fani is considered the worst cyclone to hit Odisha in this century. It was also the longest-lived cyclone in the Bay of Bengal ever observed.

The extended storm period went on for 11 days in the sea and land put together. What made it even more surprising was that it had formed in the pre-monsoon season, in April

#### **Super Cyclone Amphan, May 2020**

Amphan was the first super cyclone in the Bay of Bengal in the last 21 years and made landfall near Digha in West Bengal on May 20, 2020. It ravaged almost the entirety of south Bengal, including Kolkata.

Warm subsurface waters in the Bay of Bengal likely helped fuel it. Marine heat waves also likely helped intensify the cyclone from Category 1 (cyclonic storm) to Category 5 (super cyclone) in less than 36 hours.

### **Cyclone Nisarga, June 2020**

Nisarga originated in the Arabian Sea and made landfall June 3, 2020 on the Maharashtra coast. It was the strongest tropical cyclone to strike the state in June since 1891

### **Cyclone Yaas, May 2021**

Cyclone Yaas, forming in the Bay of Bengal, devastated several parts of West Bengal May 26 and impacted nearly 10 million people.

### **Cyclone Tauktae May 2021**

Tauktae originated in the Arabian Sea and made landfall along Gujarat's Saurashtra coast on May 17, leaving a trail of destruction. Four states on the country's western coast — Maharashtra, Saurashtra and Kutch region in Gujarat and south Rajasthan — were heavily affected

### **Cyclone Asani, May 2022**

Asani had formed May 7 in the Bay of Bengal and dissipated May 12. It had pulled the monsoon winds into the Andaman Sea but did not pull any further. Very heavy rain was reported in Kerala, Andhra Pradesh and Odisha.

### **Additional Information:**

#### **What is a super cyclone?**

Super cyclone refers to tropical storm, where wind speeds cross 220 kmph

#### **What is Bomb Cyclone?**

Normally, in a storm wind flows from high pressure areas into low pressure areas. But, when the pressure drops in the low pressure areas by '24 millibars' in 24 hours, then it rapidly intensifies the difference between the two air masses strengthening the winds that flow — this process is called 'bombogenesis'

## **5. Violence in Manipur**

### **Subject :Geography**

### **Section :Places in news**

#### **Concept :**

- Violence between Manipur's Kuki tribe and the majority Meitei community continued to rage in several parts of the Manipur.

#### **Background**

- **Manipur was boiling since February 2023**
- Manipur has been restive since February when the state government launched an eviction drive seen as targeting a specific tribal group.
- The drive led to protests but not on the scale of the one seen recently.
- **High Court's order as a trigger point**
- The recent protests were triggered by the Manipur High Court's direction to the State to pursue a 10-year-old recommendation to grant Scheduled Tribe (ST) status to the non-tribal Meitei community.
- The Court's order has brought the historical tensions between the valley-dwelling Meitei community and the state's hill tribes to a boil.
- **Violence started**
- A 'tribal solidarity march' was organised by the All Tribal Students' Union of Manipur (ATSUM) against the order of the High Court.
- Violent clashes broke out at various places in Manipur during the course of this march.

#### **Which are the major communities residing in Manipur?**

- The State is like a football stadium with the Imphal Valley representing the playfield at the centre and the surrounding hills the galleries.
- The valley, which comprises about 10% of Manipur's landmass, is dominated by the non-tribal Meitei.

- This area yields 40 of the State's 60 MLAs.
- The hills comprising 90% of the geographical area are inhabited by more than 35% recognised tribes.
- This area sends only 20 MLAs to the Assembly.

#### Why does the Meitei community want ST status?

- There has been an organised push in support of this demand since 2012, led by the Scheduled Tribes Demand Committee of Manipur (STDCM).
- In their plea before the High Court, it was **argued that the Meitei community was recognised as a tribe before the merger of the princely state of Manipur** with the Union of India in 1949.
- It **lost its identity as a tribe after the merger.**
- The demand for ST status **arose from the need to preserve the community, and save the ancestral land, tradition, culture and language of the Meiteis.**

As per the arguments forwarded by the community in the court:

- The community has been victimised without any constitutional safeguards to date.
- The Meitei/Meetei have been gradually marginalised in their ancestral land.
- Their population which was 59% of the total population of Manipur in 1951 has now been reduced to 44% as per 2011 Census data.

#### Why are tribal groups against ST status for Meiteis?

- Tribals including Nagas, Zomis, and Kukis against the ST status for Meitei.
- They comprise around 40 per cent of the state's population. The Meiteis are a dominant group controlling the state and its apparatuses.
- Hence, the claim that Meiteis need ST status to protect their culture and identity is self-defeating.
- They **feel the ST status to the Meiteis would lead to loss of job opportunities and allow them to acquire land in the hills and push the tribals out.**
- The Manipuri language of the Meiteis is included in the Eighth Schedule of the Constitution.
- Sections of the Meitei community — which is predominantly Hindu — are already classified under Scheduled Castes (SC) or Other Backward Classes (OBC).

### 6. Manipur's Ethnic fault lines

#### **Subject : Geography**

#### **Section: Human geography**

**Context:** The unrest and riots broke between tribals and the majority Meitei community, displacing over 9,000 people.

#### **What started the Manipur Violence?**

A 'Tribal Solidarity March' was organised by the **All Tribal Student Union Manipur (ATSUM)** in the ten hill districts of the state on Wednesday to protest the demand of non-tribal Meiteis, who account for 53 per cent of the state's population, for Scheduled Tribe (ST) status.

#### **Constitutional Provision:**

**Article 371C** Special provision with respect to the State of Manipur

The President may, by order made with respect to the State of Manipur, provide for the constitution and functions of a committee of the Legislative Assembly of the State consisting of members of that Assembly elected from the Hill Areas of that State

The Governor shall annually, or whenever so required by the President, make a report to the President regarding the administration of the Hill Areas in the State of Manipur and the executive power of the Union shall extend to the giving of directions to the State as to the administration of the said areas

#### **A Glimpse of the Indigenous Tribes of Manipur**

- There are 33 recognized tribes (in Manipur) which either **fall under the Nagas or the Kukis, the two different conglomerates of Manipur tribals.**
- The two communities are differentiated mainly from their distinctive dialects, costumes, cultures and traditions.
- The Nagas have a history of headhunting and a strong warrior tradition whereas the **Kukis are a sub-family of the Tibeto-Burman language group which is also related to Mizos of Mizoram and Chins in Myanmar**

- The recognized tribes who made their home in Manipur are Aimol, Anal, Chiru, Chothe, Gangte, Inpui, Hmar, Kharam, Khoibu, Koirao, Kom, Lamkang, Liangmai, Mao, Maram, Maring, Mate, Monsang, Moyon, Paite, Poumai, Purum, Ralte, Rongmei (Kabui), Simte, Suhte, Tangkhul, Tarao, Thadou, Thangal, Vaiphei, Zeme and Zou
- All the tribes generally communicate in their own dialects among the same ethnic groups while communication between different groups is **carried out in Meitei or Manipuri language**, the official language of Manipur
- Despite the socio-political and linguistic differences among them, all the ethnic tribes originate **from the same Mongoloid group** having similarities in cultural and traditional domains.

## 7. Ethnic ties, family bonds: Why Mizoram is concerned about Manipur violence

**Subject : Geography**

**Section: Places in news**

**Context:**

As the initial reports of the unrest in Manipur emerged, its neighbour Mizoram was the first to express “deep concern” on the matter from Chief Minister Zoramthanga

**Background:**

- The clashes in Manipur primarily involving the numerically dominant **Meitei community and the minority Kuki tribe** have **displaced** many people in the last few days.
- A “tribal solidarity march” on May 3 to **protest against the inclusion of the Meiteis in the Scheduled Tribe (ST) category** was just the immediate trigger
- Other government actions like the crackdown on poppy plantations and eviction drives, to frequent allegations that the **Kukis of Churachandpur** were sheltering “foreigners” from Myanmar have led to simmering tensions in the state’s southern hill districts, which border Myanmar.

**The ethnic bond**

- At the heart of Mizoram’s strong political reaction is the deep ethnic bond the Mizos and Kukis share. The **Chin-Kuki-Mizos are a conglomerate ethnic group collectively known as the ‘Zo’ people**.
- Historically, culturally, socially, linguistically, they are all related. these “ethnic tribes commonly traced their historical origin to a mythological cave known by different names by different tribes
- They are **known as Chin when they settle in Burmese plains and Chin became their official name in Burma**. Those who moved down to Lushai Hills (Mizoram) and Chittagong Hill Tracts(Bangladesh) from **Chin Hills were known as Kuki and Kuki became the official name in India**
- The term ‘Mizo’ **began to be used officially in Lushai Hills (present Mizoram) since 1946**. After that, Mizo began to be used popularly in Mizoram
- Mizo comprises of 5 major tribes and 11 minor tribes known under the common name Awzia. The **5 major tribes are Lushei, Ralte, Hmar, Paihte, Pawi (Poi)**.
- Mizos are of **Mongoloid origin, speaking a dialect of Tibeto Burman origin**
- The literacy rate is the **second highest in the country**

## 8. Groundwater exploitation and Land Subsidence

**Subject :Geography**

**Section: Physical geography**

**Concept :**

- Several independent studies have found out that the excessive groundwater extraction is causing land subsidence in north-west India, including Punjab, Haryana, Delhi, and Faridabad.
- The **Central Ground Water Board (CGWB), a subsidiary body of the Jal Shakti Ministry, is tasked with assessing the state of India’s groundwater resources**.
- It has a system of groundwater observation-wells and monitors water levels four times a year. It, however, does not analyse the consequences of ‘over exploitation.’

**Over exploitation:**

- Agricultural practices in north-west India are heavily dependent on groundwater withdrawal. With limited monsoon rain, the groundwater table is precariously low.



- The CGWB has reported that many groundwater blocks are over-exploited, leading to the depletion of underlying aquifers.
- In Punjab, for instance, 76% of the groundwater blocks are ‘over exploited’. In Chandigarh, it is 64% and about 50% in Delhi. This means that more groundwater than can be recharged is extracted.
- **Land subsidence is caused when these aquifers run dry and the layers of soil and rock above them start to sink.**
- **GRACE (Gravity Recovery and Climate Experiment) satellites based analysis** has shown a correlation between building deformities and groundwater withdrawals, and unplanned growth and urbanisation have exacerbated the issue in some parts of Delhi-NCR.
- **Land subsidence can lead to increased flooding, as the land sinks and reduces the capacity of water bodies to hold water.** In the Ganga basin, over-extraction of groundwater has caused the land to sink, leading to flooding in the area.

#### Gravity Recovery and Climate Experiment (GRACE)

- The Gravity Recovery and Climate Experiment (GRACE) was a joint mission of NASA and the German Aerospace Center (DLR).
- Twin satellites took **detailed measurements of Earth’s gravity field anomalies** from its launch in March 2002 to the end of its science mission in October 2017.
- By measuring gravity anomalies, **GRACE showed how mass is distributed around the planet and how it varies over time.**
- Data from the GRACE satellites is an important tool for studying Earth’s ocean, geology, and climate.

#### GRACE-FO Mission

- The **Gravity Recovery and Climate Experiment Follow-On (GRACE-FO) mission** is a partnership between **NASA and the German Research Centre for Geosciences (GFZ).**
- GRACE-FO is a successor to the original GRACE mission, which orbited Earth from 2002-2017.
- It carries on the extremely successful work of its predecessor while testing a new technology designed to dramatically improve the already remarkable precision of its measurement system.

#### Why need such data on groundwater and soil moisture?

- **Groundwater and soil moisture** — which depicts wetness in soil — are crucial for irrigation and crop growth.
- The need to constantly monitor groundwater and soil moisture is important since both act as useful indicators for predicting drought conditions.
- **One of the goals of the new global maps is to make the same consistent product available in all parts of the world, especially in countries that do not have any groundwater-monitoring infrastructure.**
- The data would help in managing the selection of appropriate agricultural crops and predicting yields.

#### 9. Mocha is the strongest cyclone on earth so far in this year

**Subject: Geography**

**Section: Climatology**

**Context:** Mocha, with a recorded wind speed of 150 knots or 277 kilometres per hour, also became the strongest cyclone in the North Indian Ocean during the pre-monsoon season, tying with Cyclone Fani.

#### More on the News:

- Cyclone Mocha was a **very severe cyclonic storm** that formed in the Bay of Bengal on May 10, 2023. The **storm intensified rapidly**, reaching **peak winds of 160 kilometers** per hour (100 miles per hour) before making landfall in Bangladesh on May 14. The storm caused widespread damage in Bangladesh and Myanmar.
- IMD had predicted the **formation of a ‘very severe cyclonic storm’**, which was later **upgraded to ‘extremely severe cyclonic storm’** and **now a super cyclone** is on the cards.
- Mocha **made landfall during the afternoon hours** of May 14 on the Myanmar coast near Sittwe at a speed of 180-190 kmph, gusting to 210 kmph, IMD stated.
- Cyclone Mocha was the **strongest cyclone to hit Bangladesh** in over a decade. The storm caused widespread flooding and damage to homes, businesses, and infrastructure. The government of Bangladesh declared a state of emergency and deployed the military to help with relief efforts.
- Cyclone Mocha also caused significant damage in Myanmar. The storm made landfall in the **country’s Rakhine state**, which is **home to many Rohingya refugees**. The storm **displaced thousands of refugees**



and destroyed many of their homes. The United Nations estimates that Cyclone Mocha could have a devastating impact on the Rohingya refugee population.

- **Heavy rainfall**, with the **possible risk of floods**, flash floods and landslides and there will be major impacts both ahead and after landfall for potentially hundreds of thousands of the **world's most vulnerable people**.
- According to IMD, the **Northeastern states** of Tripura, Mizoram, Nagaland, Manipur and the southern part of Assam were **likely to witness heavy-to-very heavy rains** until May 18.
- It also mentioned that **maximum temperatures** were above normal by 2-4 degrees Celsius over parts of **Northwest, central and Northeast India**.

#### Naming of Cyclone:

- Cyclones are mostly **named after regions and areas where they are formed**, mostly the **region of the sea or river** where it is formed. Similarly, Cyclone Mocha was **named after a part of the Red Sea port** which introduced coffee into the world 500 years ago. Hence, on a **suggestion made by Yemen**, the cyclone was named Cyclone Mocha (Mokha).

#### Classification of Cyclone:

Category	Sustained Winds (3-min average)
Super Cyclonic Storm	≥120 kt ≥221 km/h
Extremely Severe Cyclonic Storm	90–119 kt 166–220 km/h
Very Severe Cyclonic Storm	64–89 kt 118–165 km/h
Severe Cyclonic Storm	48–63 kt 89–117 km/h
Cyclonic Storm	34–47 kt 63–88 km/h
Deep Depression	28–33 kt 51–62 km/h
Depression	17–27 kt 31–50 km/h

### 10. Nutritional Value of Millets

**Subject :Geography**

**Section: Economic geography**

**Concept :**

- Millets are gaining popularity across the world as **the UN Food and Agriculture Organization (FAO) has declared 2023 to be the “International Year of Millets”**
- Millets are **mainly grasses that are cultivated across the world as cereal crops, particularly in the tropical regions of Africa and Asia**.
- The most famous varieties of millet include **pearl millet, barnyard millet, finger millet, and foxtail millet**.
- **India is the largest producer of millets in the world**.
- Evidence indicates that millets were first cultivated in the Indian subcontinent about five millennia ago.
- According to reports, India In 2021-2022 accounted for about 40.51% of the world's pearl millet production and 8.09% of sorghum.
- In India, pearl millet accounts for about 60% of all the millet production which is followed by sorghum (27%), and ragi (11%).

#### **Significance of Millet cultivation**

- **High nutritional value:** The nutritional value associated with millets is very high compared to other major extant food crops.
- The nutritional content of millets includes carbohydrates, proteins, fibre, amino acids, and minerals.
- **Drought resistant:** Millets have the ability to withstand and grow in harsh, resource-poor conditions.
- Millets are drought-tolerant and can grow in warm weather, requiring less moisture and loamy soil.
- **Affordable nature:** Millets can grow on arid lands with minimal inputs. Thus cultivation of millet ensures that affordable foods can be produced that can contribute to healthy diets and a healthy environment.
- **Food security and economic viability:** Millets being climate-smart grains offer great opportunities for strengthening food security, nutrition security and bolstering economic growth.

**Table 1. Consumption and Nutritional significance of Millets**

Millet	Ingredient/product	Nutritional significance
Sorghum	Flour, puffed	<ul style="list-style-type: none"> <li>Rich in protein, fibre, thiamine, folic acid and riboflavin</li> <li>Contains resistant starch</li> <li>Possesses anti-diabetic, anti-cancerous and cardio protective constituents</li> <li>Exhibits angiotensin I converting inhibitory activity</li> </ul>
Pearl Millet	Flour	<ul style="list-style-type: none"> <li>Rich in unsaturated fatty acids such as oleic acid</li> <li>Rich in dietary fiber with prebiotic potential</li> <li>Ferulic acid and coumaric acid with anti-proliferative activity</li> <li>Rich in iron and zinc</li> <li>Ameliorate anemia</li> </ul>
Finger Millet	Flour	<ul style="list-style-type: none"> <li>Rich source of calcium</li> <li>Good amount of sulphur-containing amino acids</li> <li>Rich in polyphenols - garlic, ferulic, p-hydroxy benzoic, procatechuic and p-coumaric acids</li> <li>Hypoglycemic, hypocholesterolemic, and anti-ulcerative properties</li> <li>Inhibits aldose reductase activity</li> </ul>
Little Millet	Dehusked, broken, rawa, puffed, poha	<ul style="list-style-type: none"> <li>Rich in iron and fibre</li> <li>Boosts immunity</li> </ul>
Foxtail Millet	Dehusked, broken, rawa, puffed, poha	<ul style="list-style-type: none"> <li>Good source of tocopherol</li> <li>Exhibits superior anti-oxidant activity</li> <li>Rich in linoleic acid and gamma aminobutyric acid</li> <li>Improves cholesterol metabolism</li> </ul>
Proso Millet	Dehusked, rawa, puffed,	<ul style="list-style-type: none"> <li>Good source of vitamin A, B and E</li> <li>Exhibits good antioxidant activity</li> <li>Good source of manganese</li> <li>Good for heart patients</li> </ul>
Kodo Millet	Dehusked, broken, rawa	<ul style="list-style-type: none"> <li>High lysine</li> <li>High antioxidant activity</li> <li>Good for diabetic and heart patients</li> </ul>
Barnyard Millet	Dehusked, rawa,	<ul style="list-style-type: none"> <li>Rich in crude fiber</li> <li>Low phytate containing iron-rich millet</li> <li>Protects against diabetes</li> </ul>
Browntop Millet	Dehusked, flour	<ul style="list-style-type: none"> <li>Rich in protein and dietary fibre</li> <li>Possesses anti-diabetic potential owing to gallic, caffeic and coumaric acids</li> <li>Good source of calcium, phosphorus and zinc</li> </ul>

### Processing of Millets and its impact on nutritional content

- The ‘whole grain’ consists of the endosperm, germ, and bran (pericarp + aleurone). However, the “**refined grain**” refers only to the endosperm.
- The endosperm is the largest part of the millet kernel and is called the “storage centre”. The **endosperm also has a protein covering called the “aleurone”**.
- The pericarp has an outer covering called the **husk**. The husk and the pericarp protect the kernel from harsh conditions, diseases, and damages.

### Effect of processing of millets:

- Processing of millets for consumption can affect nutrients in three different ways, namely enhancing them, suppressing them, and ignoring them.**
- During processing, the husk is first removed from the grains as it is made of cellulosic matter that the human body cannot digest.
- However, this results in the **decline of the phytic acid and polyphenol contents** in the millets.
- The next step in processing **involves decortication of the grain**, wherein the outer covering is removed in order to expose the seed. This is made to make the **grain more edible and attractive**.
- Decortication of the grains adversely impacts the crude and dietary fibre content** in the millet grains.
- The next steps **involve milling, grinding (into flour), and sieving to remove large impurities such as bran**.
- Studies have revealed that **sieving made the flour more digestible**. However, **it also reduced nutrient content due to the removal of bran**.

### Polishing of Millets:

- Polishing is **typically the last step and it is a process wherein brown rice**, for example, is changed to white rice by rubbing off the bran and the germ.
- According to various studies, **polishing removed 8-10% of grain weight** and also **removed important nutritional contents such as iron, magnesium, phosphorus, potassium, and manganese**.

## 11. The demand for a Kuki homeland, its history and rationale

### Subject : Geography

#### Section: Human geography (Tribes in news)

#### Context:

Days after Clashes between Manipur’s Kuki Zomi tribes and the majority Meitei community left more than 70 people dead, the state’s 10 Kuki-Zomi MLAs demanded “a separate administration under the Constitution

## A Kuki homeland

- The demand for a separate “Kukiland” dates back to the late 1980s, when the first and largest of the Kuki-Zomi insurgent groups, the Kuki National Organisation (KNO), came into being.
- In 2012, Kuki State Demand Committee (KSDC) announced a movement for Kukiland.
- The territory of “Kukiland” included the Sadar Hills (which surround the Imphal valley on three sides), the Kuki-dominated Churachandpur district, Chandel, which has a mix of Kuki and Naga populations, and even parts of Naga-dominated Tamenglong and Ukhrul
- The Kukiland demand is rooted in the idea of the Zale’n-gam, or ‘land of freedom’. They were brought from the Kuki-Chin hills of Burma by the British political agent and settled around the Imphal valley to protect the Manipur kingdom from the plundering Naga raiders of the north.
- According to the KNO, the Zale’n-gam included the area up to the Chindwin river in Myanmar and covered the bordering regions of India, the areas around the Nantalit river in northern Myanmar, and stretched to the Chin state in the south.
- In India, the Kuki homeland included the hill districts of Manipur, including the Naga areas, Kanjang, Akhen, Phek, and parts of Dimapur in Nagaland, Karbi-Anglong, North Cachar Hills, and Halflong in Assam, and Tripura, as well as parts of the Chittagong Hill Tracts in Bangladesh.

## About Kuki Tribe:

- The Kuki people are an ethnic group in the southeastern part of Mizoram and Myanmar.
- The Kuki constitute one of several hill tribes within India, Bangladesh, and Myanmar.
- In Northeast India, they are present in all states except Arunachal Pradesh
- The Chin people of Myanmar and the Mizo people of Mizoram are kindred tribes of the Kukis. Collectively, they are termed the Zo people.

## 12. Shrinking of lakes worldwide

### Subject: Geography

### Section: Places in news

#### Context:

- More than 50 percent of the world’s largest lakes and reservoirs have shrunk over the past three decades, also more than half of the reservoirs located in peninsular India have witnessed substantial water storage decline. Moreover among the affected among natural lakes in India is Tso Moriri.
- **Causes**
- 57 percent of the net decline in the water quantity in natural lakes is due to unsustainable consumption of water like in Aral sea, and also due to increasing and potential evapotranspiration (PET)-loss of water due to both evaporation and transpiration-with the latter two indicating the role of climate change (ex. Lake Kara Bugaz). Besides this two-thirds of all reservoirs have experienced significant declines due to sedimentation.



- The Aral sea dried up.
- **Consequences**
- Two billion people, a quarter of the global population, depend on lakes for freshwater will be severely affected. Hydropower generation will be affected. The reduced size of these lakes not only results in environmental degradation but also disrupts the water and carbon cycle by rising water temperature which now starts emission of Carbon dioxide. The lakes encroached upon in India, especially in urban areas leads to incidence of Urban flooding as no lake is there to act as flood buffer (Ex Bangalore).
- **How to conserve**
- Lakes should be managed in integrated manner. Steps like restrictions on water consumption and climate mitigation to bring down global temperatures are some of the ways to conserve them. This will also help in

reducing sedimentation in reservoirs as the rate of sedimentation is linked to climate change- it increases when there is extreme precipitation, as well as land disturbance such as wildfires, landslides, deforestation.

### 13. Salt caverns as strategic petroleum reserves in India

#### **Subject :Geography**

#### **Section: Economic Geography**

#### **Context**

India is exploring the idea of developing salt caverns in Rajasthan as strategic petroleum reserves and public sector consultancy Engineers India Limited (EIL) has been tasked with studying its prospects and feasibility.

#### **Existing strategic petroleum reserves**

India has three strategic petroleum reserves at **Mangalore, Padur and Visakhapatnam**, but all of these are made up of excavated rock caverns. Over the past decade a strategic oil reserve was to be built at **Bikaner, Rajasthan** but the program never took off. With a salt cavern based strategic oil reserve being deliberated, Rajasthan has once again come into picture. Presently, India does not have technology to excavate salt caverns and we are tying with Germany on this.

#### **Salt cavern**

“There are formations in geology which have salt inside. The salt has to be taken out and the caverns have to be prepared for storage of crude. Most of US strategic oil reserves are in salt caverns. Unlike rock caverns, which are developed through excavation, salt caverns are developed by pumping water into geological formation with large salt deposits to dissolve the salt. Then the salt cavern is created by draining out the salt dissolved in water. Developing salt caverns is said to be easier, faster, less labour- intensive, and cheaper than building a rock cavern.

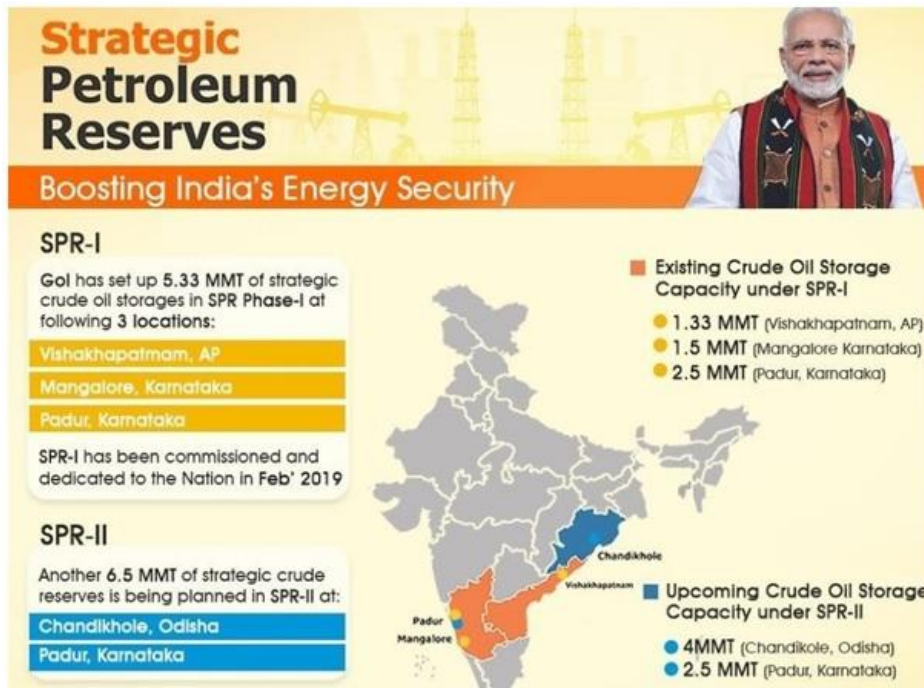
#### **Why the need**

India's strategic petroleum reserve has a cumulative capacity of 5.33 million tonnes of crude and can meet only 9.5 days of the country's oil demand and hence more storage caverns are needed.

#### **About Strategic oil reserves –**

- Strategic petroleum reserves are huge stockpiles of crude oil to deal with any crude oil-related crisis like the risk of supply disruption from natural disasters, war or other calamities.
- According to the agreement on an International Energy Programme (I.E.P.), each International Energy Agency (IEA) country has an obligation to hold emergency oil stocks equivalent to at least 90 days of net oil imports.
- In case of a severe oil supply disruption, IEA members may decide to release these stocks to the market as part of a collective action.
- India's strategic crude oil storages are currently located at Visakhapatnam (Andhra Pradesh), Mangaluru (Karnataka), and Padur (Karnataka).
- The government has also given approval for setting up of two additional facilities at Chandikhol (Odisha) and Padur (Karnataka).
- The concept of dedicated strategic reserves was first mooted in 1973 in the US, after the OPEC oil crisis.
- Underground storage is, by far the most economic method of storing petroleum products because the underground facility rules out the requirement of large swathes of land, ensures less evaporation and, since the caverns are built much below the sea level, it is easy to discharge crude into them from ships.
- The construction of the Strategic Crude Oil Storage facilities in India is being managed by Indian Strategic Petroleum Reserves Limited (ISPRL).
  - ISPRL is a wholly owned subsidiary of Oil Industry Development Board (OIDB) under the Ministry of Petroleum & Natural Gas.
- After the new facilities get functional a total of 22 days (10+12) of oil consumption will be made available.
- With the strategic facilities Indian refiners also maintain crude oil storage (industrial stock) of 65 days.
- Thus, approximately a total of 87 days (22 by strategic reserves + 65 by Indian refiners) of oil consumption will be made available in India after completion of Phase II of the SPR programme. This will be very close to the 90 days mandate by the IEA.





#### 14. Antarctic overturning circulation

**Subject : Geography**

**Section: Climatology**

**Concept :**

- Antarctica sets the stage for the world's greatest waterfall. The action takes place beneath the surface of the ocean.
- Here, trillions of tonnes of cold, dense, oxygen-rich water cascade off the continental shelf and sink to great depths.
- This Antarctic "bottom water" then spreads north along the sea floor in deep ocean currents, before slowly rising, thousands of kilometres away.
- In this way, **Antarctica drives a global network of ocean currents called the "overturning circulation"** that **redistributes heat, carbon and nutrients around the globe**. The overturning is crucial to keeping Earth's climate stable. It's **also the main way oxygen reaches the deep ocean**.
- But there are signs this circulation is slowing down and it's happening decades earlier than predicted. This slowdown has the potential to disrupt the connection between the Antarctic coasts and the deep ocean, with profound consequences for Earth's climate, sea level and marine life.

#### **Atlantic Meridional Overturning Circulation (AMOC)**

- The Atlantic Meridional Overturning Circulation (AMOC) is a major ocean current system that transports warm surface waters from the tropics toward the northern Atlantic and colder deep waters that are part of the thermohaline circulation, southward.
- One of the main ways the ocean circulates heat, salt, carbon, and nutrients throughout the world's oceans is through overturning circulation.

#### **What is thermohaline circulation?**

- The thermohaline circulation, also known as the ocean's conveyor belt, is part of the ocean circulation and is powered by temperature and salinity differences causing density differences. These are deep ocean currents occurring thousands of meters below the sea surface.
- It leads to intermixing of salt and heat. Thus, it effectively describes a driving mechanism.

#### **Working of Atlantic Meridional Overturning Circulation**

- The Atlantic Ocean's warm water cools as it travels north, and evaporation raises its salt content.
- The water sinks deep into the ocean due to its increased density brought on by a combination of a low temperature and a high salt content.
- Deep below, the chilly, dense water steadily moves southward.

- It eventually returns to the surface, warms up once more, and the circulation is complete.

### Significance of AMOC

- AMOC helps to disperse heat and energy throughout the earth (heat budget).
- Because of AMOC, the climate in Western Europe is less severe even during the winter (Gulf Stream, North Atlantic Drift).
- By absorbing and storing carbon from the atmosphere, it serves as a carbon sink.
- Carbon sequestration by AMOC has profound effects on how anthropogenic global warming develops.
- The distribution of heat to the polar regions is largely dependent on thermohaline circulation. As a result, it impacts how quickly sea ice forms at the poles, which in turn affects other components of the climate system (such as the albedo, and thus solar heating, at high latitudes).

## 15. Kerala's water budget, a step towards effective water management

### Subject: Geography

### Section: Physical geography

#### Context:

- Kerala floods and water imbalance across the regions gave rise to the concept of “water budget” and “water conservation” in Kerala state. On **April 17, 2023**, Chief Minister Pinarayi Vijayan released the details of the first phase of the **water budget**.

#### Details:

- The **concepts of water budget and water conservation** were floated by a few in **2018** and in **2019**.
- Kerala began recording the availability of water, its consumption, surplus and deficit in 94 gram panchayats of the state.

#### State of water availability in Kerala:

- Unlike the northern states of India that get water from **melting of snow**, **rainfall is the only source of water for Kerala**.
- The **annual average rainfall in the state is around 3,000-3,200 mm** from the two monsoon seasons and summer rains, but it exhibits significant variations depending on the geography.
- The **northern districts of Kerala** receive **very little rain** after the south-west monsoon and hence require more long-term conservation methods than the southern districts which get both the returning monsoon and the summer rains.

#### Initiative taken:

- **Navakeralam Karma Padhathi (NKP)** is an initiative to solve socio-economic challenges in the state.
- **Haritha Keralam Mission**, which spearheads the **water budget project**, is a **sub-mission under the NKP** focusing on eco-friendly development initiatives in agriculture, water conservation and climate-resilient disaster management practices.

#### Water Budget:

- A **water budget** is a **hydrological tool** used to **quantify the flow of water** in and out of a system.
- In other words, it is an **accounting of all water stored and exchanged on the land surface (rivers, lakes), subsurface (aquifer, groundwater), and atmosphere (precipitation, evaporation)**.
- The concept behind a water budget is that the **rate of change of water stored in an area is balanced by the quantity and rate at which water flows into and out of that area**.
- Hydrological engineers use this concept to form the basis of effective water-resource sustainability, management, and environmental planning.

The water budget can be expressed in several ways. The United States Geological Survey (USGS) defines the water budget for a small watershed as:

$$P + Q_{in} = ET + \Delta S + Q_{out}$$

Where:

**P** = precipitation (rain, snow, etc.)

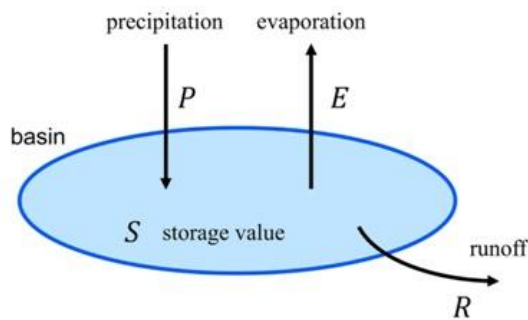
**Q<sub>in</sub>** = water flow into the watershed

**ET** = quantity of evapotranspiration from soils, surface water, plants, etc.



$\Delta S$  = Change in water storage

**Q<sub>out</sub>** = sum of water flowing out of the watershed



#### Approach used in water budget:

- While calculating availability, **both surface water and ground water** was taken into account in the water budget.
- The scientific inputs for the calculation of the availability and requirement of water came from the scientific team at the **Centre for Water Resources Development and Management (CWRDM)**.
- The **distribution of summer rain, south-west monsoon and north-east monsoon, variation in terrain, area under forest, landuse pattern, rainfall infiltration, groundwater recharge, water flowing into the panchayat and water made available outside the panchayat** were all considered while calculating the supply and demand.
- The consumption of water for **domestic use, irrigation, business, tourism and industrial needs** were factored in, while calculating the total demand.
- **Advantages of water budget:**
- The water budget is an excellent tool that will help the **panchayats analyse water distribution, and bridge the gaps between demand and supply**.
- The water budget will **aid gram panchayats** to design interventions that will **solve water shortages** if any, **plan their projects better**, and also help to **increase land under agriculture**.

#### 16. Mass mountaineering in Everest

**Subject: Geography**

**Section: Physical geography**

**Context:**

- Recent influx of ‘novice mountaineers’, who may expect luxury packages and a guarantee of summiting, can have dangerous consequences. Sleeping in heated tents, not preparing their own food or helping to move equipment, does not test mental and physical fitness in such challenging environments. Pushing to the summit may put their own lives and the lives of other climbers and rescue team at risk. In 2019, 878 successful climbs happened while in 2023 till now 11 mountaineers have died which is the highest ever.
- **Challenges**
- Experienced mountaineers are responding to the challenges of overcrowding, pollution and socio-cultural impacts on mountain communities by advocating for more responsible and sustainable mountaineering practices. Stricter regulations and training is required to protect fragile ecosystem of mountains from unsustainable mountaineering
- This will require many stakeholders like governments, mountaineering organisations, tourism operators and local communities.
- **Way forward**
- Finally, maybe it’s time to introduce minimum skill requirements for climbing the world’s highest peak. As we mark the 70th anniversary of the first ascent of Everest by Hillary and Norgay, we need to reflect on the changes that have taken place in mountaineering since. Meeting those challenges and solving the problems will be the best way to honour the extraordinary achievement of Edmund Hillary and Tenzing Norgay.

#### 17. India becomes net copper importer for the fifth year in a row

**Subject :Geography**

**Section: Economic Geography**

### Context:

- India's **copper imports** witnessed a 15 per cent year-on-year jump in financial year 2022-23.

### Details:

- From a **net exporter of 335,000 tonnes in 2017-18**, India became a **net importer of copper, first in 2018-19** and the trend remains unaltered till 2021-22.
- During the April-October period of the current fiscal also, India's import at 88,000 tonnes was higher than exports of 16,000 tonnes.
- Major cause:
  - Domestic copper production fell significantly from FY2019 onwards** as a result of **shutdown of the Sterlite Copper plant in Tuticorin**.
  - Lower refined production created a huge deficit in the domestic copper market**, resulting in large imports for fifth year in a row.
- Given the healthy copper demand outlook in the domestic market, the deficit situation is unlikely to improve in the near term.

### Production and consumption pattern:

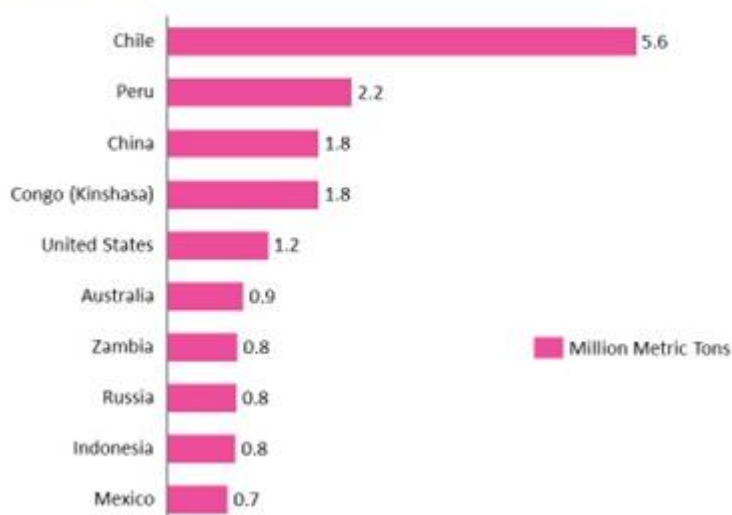
- While **production steadily fell since Sterlite's unit closure** and the trend continued till FY21, there was a **rise in production last fiscal** but it was well short of the 2017-18 level.
- Consumption has been on the upswing, largely due to demand from electrical, electronics, infrastructure and electric vehicle segments.
- Government's thrust on infrastructure and rapid offtake of electric vehicles, domestic demand for copper would go up by 10-11% in the next two years.

### About Copper:

- Nuggets of the metal could be **found in streams in a few areas**, and its properties allowed it to be easily worked without a required processing step.
- Copper's metallic lustre attracted people's attention. Today most copper is produced from sulfide ores.
- Copper is an excellent conductor of heat and electricity.
- Large amounts are also used to make alloys such as brass (copper and zinc) and bronze (copper, tin, and zinc). Copper is also alloyed with precious metals such as gold and silver.
- Major producer:**
  - Chile is the world's largest producer of copper**, three of the world's ten largest copper mines based on capacity are located there.

### Largest Copper producing Countries in 2021

(Million Metric Tons)



- Major copper-producing states in India:**
  - Copper production in India is only about 2 percent of world copper production.
  - Madhya Pradesh is the leading producer of copper** in India.
  - It accounts for producing **53% of copper in this country**.
  - Rajasthan** accounts for **43%**, and **Jharkhand** accounts for **4%** of copper production in India.

- The global ranking is **4th in smelter production** and **7th in refined copper consumption**.
- **Five largest copper mines in India:**
  - **Malanjkhand Mine, Madhya Pradesh**
  - **Khetri mine, Rajasthan**
  - **Kolihan mine, Rajasthan**
  - **Surda mine, Jharkhand**
  - **Banwas mine, Rajasthan**

#### 18. 'India keen to boost ties with Cambodia'

**Subject : Geography**

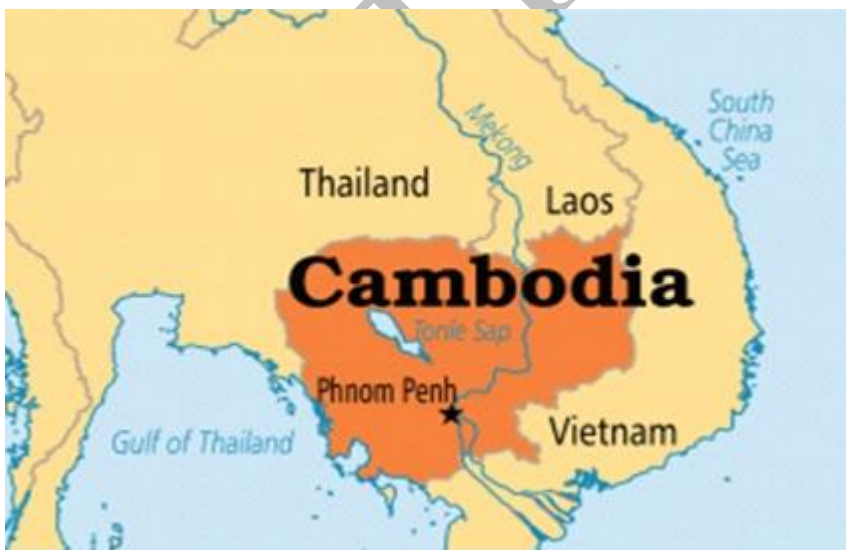
**Section: Place in news**

**Concept :**

- The President of India has held that India is keen to further elevate its defence relations with Cambodia besides increasing tourism and people-to-people contacts.
- While welcoming the King of Cambodia, at Rashtrapati Bhavan, the President of India has added that there is great potential for further growth in trade and investment between India and Cambodia.
- India is keen to further boost its defence relations with the Southeast Asian country.
- The President further said that the visit of the King of Cambodia to India demonstrates the importance that Cambodia attaches to its ties with India as the two countries share a rich and vibrant relationship.

#### **About Cambodia**

- Cambodia lies entirely within the tropics, between latitudes 10° and 15°N, and longitudes 102° and 108°E.
- It borders Thailand to the north and west, Laos to the northeast, and Vietnam to the east and southeast.
- The country is situated in its entirety inside the tropical Indomalayan realm and the Indochina Time zone (ICT).
- It has a 443-kilometer coastline along the **Gulf of Thailand**.
- Cambodia's landscape is characterized by a low-lying central plain that is surrounded by uplands and low mountains and includes the Tonle Sap (Great Lake) and the upper reaches of the Mekong River delta.
- Cambodia's main geographical features are the **low-lying Central Plain** that includes the Tonlé Sap basin, the lower Mekong River flood-plains and the Bassac River plain surrounded by mountain ranges to the north, east, in south-west and south.
- The landmass is bisected by **the Mekong River, which is the longest river in Cambodia**. In 1997, it was successfully nominated as a UNESCO Biosphere Reserve.
- The majority of the country lies within the Tropical savanna climate zone, as the coastal areas in the South and West receive noticeably more and steady rain before and during the wet season.



## History

### 1. Who was Samarth Ramdas and what was his relationship with Chhatrapati Shivaji Maharaj?

#### Subject: History

#### Section: Personality

**Context:** The Nationalist Congress Party (NCP) has demanded an “unconditional apology” from Jaggi Vasudev of the Isha Foundation for a video in which he is seen making the claim that Saint Samarth Ramdas was Maratha Ruler Chhatrapati Shivaji’s guru.

#### What do historians say about this?

Most historians agree that the issue of calling **Samarth Ramdas the guru of Chhatrapati Shivaji is to do with the maintenance of Brahmanical supremacy** and that there is no historical evidence to verify the fact

To take credit for the work of Shivaji Maharaj, the Brahmanical system installed Ramdas as guru of Shivaji Maharaj. But the contemporary important historical texts do not even mention him.

#### Who was Samarth Ramdas?

- Samarth Ramdas (1608 – 1681), also known as Sant Ramdas or Ramdas Swami, was a Hindu **saint, philosopher, poet, writer and spiritual master**
- A devotee of Lord Ram and Hanuman, he toured the entire Indian subcontinent for 12 years, during which he came across various spiritual teachers and diverse religious traditions
- Ramdas has influenced Hindu nationalist thinkers across the years. **The likes of Lokmanya Tilak, RSS founder KB Hedgewar, and VD Savarkar, all claimed to have been inspired by the 17th century saint**
- Ramdas had extensive literature written during his lifetime. His literary works include Dasbodh, Karunashtakas, Sunderkand, Yuddhakand, Poorvarambh, Antarbhav, Aatmaaram, Chaturthman, Panchman, Manpanchak, Janaswabhawgosavi, Panchsamasi, Saptsamasi, Sagundhyan, Nirgundhyan, Junatpurush, Shadripunirupan, Panchikaranyog, ManacheShlok and Shreemad
- Unlike the saints **subscribing to Warkari tradition, Ramdas is not considered to embrace pacifism. His writings include strong expressions encouraging militant means to counter the barbaric Islamic invaders.**
- **Ramdas was a proponent of Dvaita**, a philosophy first proposed by the 13th-century Indian philosopher, Madhvacharya. Ramdas was an exponent of Bhakti Yoga or the path of devotion

#### Additional Information:

- Shivaji was born in Shivner near Junnar. He was the son of **Shahji Bhonsle** by his first wife Shahji was a descendant of the **Yadava** rulers of Devagiri from his mother’s side and the Sisodias of Mewar on his father’s side
- On 6 June 1674, Shivaji was crowned at He assumed the title of “Chhatrapathi”
- The relentless campaigns affected Shivaji’s health. He died in 1680 at the age of 53. At the time of his death, Shivaji’s kingdom comprised the Western Ghats and the Konkan between Kalyan and Goa. The provinces in the south included western Karnataka extending from Belgaum to the bank of Tungabhadra.
- **Contemporaries: Tuka Ram** was a contemporary of Maratha Shivaji and saints like **Eknath** was regarded by Shivaji as his guru. He had conflict with the Mughals (1670) at **Aurangzeb reign**

#### Administration

- Shivaji divided the kingdom into four provinces, each under a viceroy. The provinces were divided into a number of Pranths.
- This council of eight ministers was known as **Ashta Pradhan**. Its functions were advisory. **Mukhya Pradhan or Peshwa** or prime minister, The **Amatya** or finance minister, The **Warkia-Nawis** or **Mantri**, **Sumant** or **Dabir** or foreign secretary, **Sachiv** or **Shuru Nawis** or home secretary, **Pandit Rao** or **Danadhyaksha** or **Sadar** and **Muhtasib** or ecclesiastical head, **Nyayadhish** or chief justice, **Sari Naubat** or commander-in-chief
- Shivaji collected two taxes, **Chauth** and **Sardeshmukhi**, from the adjoining territories of his empire, the Mughal provinces and the territories of the Sultan of Bijapur. Chauth was one-fourth of the revenue of the district conquered by the Marthas. Sardeshmukhi was an additional 10% of the revenue which Shivaji collected by virtue of his position as Sardeshmukh.
- The infantry was divided into regiments, brigades. The smallest unit with nine soldiers was headed by a Naik (corporal). Each unit with 25 horsemen was placed under one havildar (equivalent to the rank of a sergeant).

Over five havildars were placed under one jamaladar and over ten jamaladars under one hazari. Sari Naubat was the supreme commander of cavalry.

- The cavalry was divided into two classes: the bargirs (soldiers whose horses were given by the state) and the shiledars (mercenary horsemen who had to find their own horses). There were water-carriers and farriers too

## 2. Rabindranath Tagore

**Subject: History**

**Section: Personality**

**Concept :**

- Prime Minister recently paid tributes to Nobel laureate Rabindranath Tagore on his birth anniversary.

**About Rabindranath Tagore:**

- He was a **world-renowned poet, litterateur, philosopher and Asia's first Nobel laureate.**
- He was born in Kolkata on May 7, 1861.
- He was the **son of Debendranath Tagore, a prominent philosopher and religious reformer.**
- He was popularly known as **Bard of Bengal, and people used to call him Gurudev.**
- He introduced new prose and verse forms and the use of colloquial language into **Bengali literature**, thereby **freeing it from traditional models based on classical Sanskrit.**
- He was highly influential in introducing Indian culture to the West and vice versa.
- **In 1913 he became the first non-European to receive the Nobel Prize for Literature.**
- He was also an influential artist and musician. He wrote around 2230 songs and painted 3000 paintings. **His songs are known as Rabindra Sangeet.**
- **Rabindranath Tagore wrote India's national anthem, Jana Gana Mana. He also wrote Amar Sonar Bangla, the national anthem for Bangla. The Sri Lankan national anthem was inspired by his work.**
- He was awarded a **knighthood in 1915, but he repudiated it in 1919 as a protest against the Amritsar (Jallianwalla Bagh) Massacre.**
- **Viswa Bharti University, which was known as Shantiniketan** founded by Rabindranath Tagore.
- **Major Works:**
- **Tagore's most notable work of poetry is Gitanjali: Song Offerings, for which he received the Nobel Prize in Literature in 1913.**
- Other notable poetry publications include **Sonar Tari and Manasi.**
- He wrote novels, plays, and short stories in both languages, including the **plays Chitra and The Post Office.**
- He is credited with pioneering the short story form in Bengali literature, with some of his best work collected in **The Hungry Stones and Other Stories and The Glimpses of Bengal Life.**

## 3. EU in Israel cancels Europe Day event over Ben-Gvir: What is this day?

**Subject: History**

**Section: World History**

**Context:** The European Union's delegation in Israel Monday (May 8) cancelled its Europe Day diplomatic reception over the planned participation of far-right Israeli minister Itamar Ben-Gvir

**Details:**

- On the continent, **the Russia-Ukraine conflict casts a long shadow on Europe Day** celebrations this year. Russia has cancelled events in many regions, fearing Ukrainian shelling. On the other hand, in an attempt to break from its Soviet past, Ukraine has decided to observe Europe Day on May 8 (like Western Europe) rather than May 9 (like Russia).
- **Europe Day:**
- Europe Day held on 9 May every year celebrates peace and unity in Europe. The date marks the **anniversary of the historic 'Schuman declaration' that set out his idea for a new form of political cooperation in Europe**
- **The Schuman Declaration** was presented by French foreign minister Robert Schuman on 9 May 1950.
- **Victory in Europe Day (V-E Day or simply, Europe Day) is one of the most important days in the history of Europe.** It was on May 8, 1945 (May 9 in Eastern Europe) that the surrender of the German armed forces was formally accepted, bringing an end to a war that had killed millions on battlefields, across bombarded cities and in brutal concentration camp



- **World War II officially began in 1939, with Germany's invasion of Poland drawing Britain into the War.** While Germany enjoyed initial success, conquering much of Western Europe and making inroads in the East, the Luftwaffe's failure in the Battle of Britain, Hitler's doomed invasion of Soviet Russia, and the entry of the US into the conflict in 1941 would soon turn the tide
- **By 1945, Germany faced inevitable defeat.** On the East, the Red Army marched towards Berlin with its enormous manpower and resource base. On the West, British, American and other allied troops hastened towards the German capital, after the successful D-Day landings on June 6, 1944.
- Germany's biggest European ally Italy had collapsed and the Japanese were preparing for a lengthy campaign to defend their home islands, having lost most of the territory they had gained in the early years of the War.
- Thus, on **April 30, 1945, as the Battle of Berlin raged on with both Soviets and Western Allies competing with each other to capture the city**, German Fuhrer and Nazi Party supremo Adolf Hitler died by suicide.
- Karl Donitz succeeded Hitler and immediately started negotiating a full surrender. The German Instrument of Surrender was signed on May 8, 1945 in Karlshorst, Berlin.

#### 4. INTACH demands heritage tag for Paralakhemundi railway station in Odisha

**Subject: History**

**Section: Art and Culture**

**Context:**

The Odisha unit of Indian National Trust for Art and Cultural Heritage (INTACH) has demanded preservation and heritage status for the Paralakhemundi railway station in Odisha's Gajapati district.

**Paralakhemundi railway station:**

- It belongs to **East Coast Railway** of Waltair division
- It is located in **Gajapati district of Odisha**
- It was established by Gajapati Maharaja of Paralakhemundi and it is first odisha Origin Railway station of Odisha state
- This line was the **first Lite rail line of eastern India** otherwise known as **Parlakimedi Light Railway PLR**
- The Mahendragiri Hills, which are biodiversity, heritage and pilgrimage site, have the nearest railhead at Paralakhemundi.
- The hills have some of the oldest temples of India which find reference in both the Ramayana and Mahabharata

**Indian National Trust for Art and Cultural Heritage (INTACH)**

- INTACH was founded in **1984 in New Delhi**
- It aims to create a membership organisation to stimulate and spearhead heritage awareness and conservation in India
- It is a **non-profit charitable organisation registered under the Societies Registration Act, 1860**
- The INTACH Logo, based on the **anthropomorphic copper figure from Shahabad, Uttar Pradesh, belonging to the enigmatic Copper Hoards of the Ganga Valley**

**World Heritage Site**

- It is a landmark or area with legal protection by an **international convention (the protection of the World Cultural and Natural Heritage) administered by the UNESCO in 1972.**
- They are designated by UNESCO for having **cultural, historical, scientific or other form of significance.**
- The sites are judged to contain cultural and natural heritage around the world considered to be of outstanding value to humanity.
- There are **40 UNESCO World Heritage Sites in India. Dholavira and Ramappa Temple are the latest addition** to the list under the 'Cultural Category'.

#### 5. Bring back Kohinoor from the U.K., parliamentary panel notes in its report

**Subject :History**

**Section: Art and Culture**

**Context:** Nothing prevents India from seeking the return of the Kohinoor diamond, which left Indian shores in the early 1850s and is currently embedded in the crown of the British monarch

**Background:**



- The report on ‘Heritage Theft – The Illegal Trade in Indian Antiquities and the Challenges of Retrieving and Safeguarding Our Tangible Cultural Heritage’ was adopted by the Standing Committee on Transport, Tourism and Culture headed by YSR Congress MP Vijay Sai Reddy.
- India does not have legal competence to demand the return of the diamond.
- Under the provisions of the **Antiquities and Art Treasure Act, 1972** the Archaeological Survey of India takes up the issue of retrieval of only such antiquities that have been illegally exported out of the country.
- But the **Articles 7 and 15 of the 1970 UNESCO convention** indicates that the convention does not prevent state parties from entering special agreements for the restitution of removed cultural properties”

#### The UNESCO 1970 Convention

- **The 1970 Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property** urges States Parties to take measures to prohibit and prevent the illicit trafficking of cultural property.
- It provides a common framework for the States Parties on the measures to be taken to prohibit and prevent the import, export and transfer of cultural property.
- **The return and restitution of cultural property is central to the Convention and its duty is not only to remember but to fundamentally safeguard** the identity of peoples and promote peaceful societies whereby the spirit of solidarity will be strengthened.

#### The Koh-i-Noor : Timeline

- **14th Century AD:** in the early 14th century, Alauddin Khilji, second ruler of the Turkic Khilji dynasty of the Delhi Sultanate, and his army began robbery the kingdoms of southern India. **Malik Kafur, Khilji’s general, created a victorious raid on Warangal in 1310** when he probably acquired the diamond.
- **16th Century AD :**It remained within the Khilji family line and later passed to the succeeding dynasties of the Delhi Sultanate, till it came into **the possession of Babur.**
- **17th Century AD:** Shah Jahan, the fifth Mughal emperor, had the **stone placed into his ornate Peacock Throne.** In 1658, his son and successor, Aurangzeb, confined the unwell emperor at nearby Agra Fort. Whereas within the possession of Aurangzeb, weight of the stone was reduced from 793 carats (158.6 g) to 186 carats (37.2 g). For this carelessness, Borgia was admonished and punished 10,000 rupees.
- **18th century (1739 AD ):** Following the **1739 invasion of Delhi by Nader Shah**, the Shah of Persia, the treasury of the Mughal Empire was plundered by his army in an organized and through the acquisition of the Mughal nobility’s wealth. Besides a bunch of valuable things, together with the Daria-i-Noor, as well as the Peacock Throne, the Shah conjointly carried away the Koh-i-Noor.
- **18th Century (1747 AD):**After the **assassination of Nader Shah in 1747** and also the collapse of his empire, the stone came **into the hands of one of his generals, Ahmad Shah Durrani**, who later became the amir of Islamic State of Afghanistan.
- **19th Century (1813 AD):**After Ahmad Shah the Diamond came into possession of Ahmad Shah Durrani’s descendent **Shauja Shah Durrani**. Shah Shuja Durrani **brought the Koh-i-door back to India in 1813 and gave it to Ranjit Singh** (the founding father of the Sikh Empire). In exchange, Ranjit Singh helped Shah Shuja retreat to the throne of Islamic State of Afghanistan.
- **19th Century (1849 AD):**On twenty-nine **March 1849, following the conclusion of the Second Anglo-Sikh War**, the dominion of Punjab was formally annexed to British India, and also the **Last treaty of Lahore was signed, formally cession the Koh-i-Noor to Empress and the Maharaja’s other assets to the company**

#### 6. At a Kutch Harappan graveyard, team works to unlock a mystery: Life and times of those buried

##### **Subject :History**

##### **Section: Art and Culture**

**Context:** The burial site, spread over 16 hectares in a Kutch village, is considered to be the largest pre-urban Harappan cemetery.

##### **Research findings:**

- The Harappan civilisation, one of the oldest in the world, is said to have thrived along the Banks of river Indus from around 5,000 BC to 1,000 BC.
- While the 2,500-year-long period from 5,000BC to 2,600BC is known as the ‘pre-urban’ Harappan phase, between 2,600 BC and 1,900 BC is the ‘urban’ Harappan phase.

- From there on, the civilization declines and 1,900 BC to 1,000 BC is considered the 'post-urban' Harappan period.
- The fragment of a shell bangle collected from the Khatiya cemetery and tested at Physical Research Laboratory (PRL), Ahmedabad, was found to be dating back to 2,850 BC.
- **The pottery found as burial goods at the Khatiya site, mainly redware, buffware and grayware, is comparable to the pre-urban Harappan pottery of Sindh and Balochistan and North Gujarat.**
- The soil in Khatiya is acidic, facilitating faster decomposition of bodies. Therefore, researchers are finding it hard to extract DNA from samples excavated from this site."
- **Dholavira, the UNESCO World Heritage Site and one of the biggest metropolises of the Harappan civilisation, is also in Kutch.** It is 150 kilometres Away from Khatiya that's among the western-most of the Harappan sites in India.
- Given the distance, researchers say, it's unlikely that people in the pre urban settlements of Dholavira were buried at the Khatiya site.
- "Desalpar and Khirsara, KotdaBhadli and Nadapa are the other well-known Harappan sites in western Kutch. But each of them is a site of urban and post-urban periods of the Harappan civilization and more than 50 km away from Khatiya.
- Being a **pre-urban Harappan cemetery, there is a possibility that either there was a Big settlement in Khatiya or there were smaller settlements around Khatiya** and the cemetery was a Common burial ground for them,"
- **Khatiya is located on the banks of the Gandi, a stream that drains into the Great Rann of Kutch (GRK).** Today, the GRK is an expanse of Saline mud flats, but archaeologists believe it used to be navigable in
- **Pre historic times and that the Ghaggar-Harka-Nara river used to flow through it. Later, the river dried up, turning Kutch into an arid region.**

## 7. The CholaSengol Tradition

**Subject : History**

**Section: Art and Culture**

**Concept :**

- The New Parliament to house Sceptre (Sengol) that symbolised transfer of Power on 1947.
- **Historical Significance of the Sengol:**
- The sceptre is a **historical symbol of Independence** as it signifies the transfer of power from the British to the Indians.
- **Sengol's origin can be traced back to the Chola dynasty of South India**, one of the longest-ruling dynasties in the world.
- During Chola's rule the power was transferred in the presence of a priest, and it was **sanctified with Sengol that would remind the king to rule with justice.**
- **The Sengol in Tamil Nadu state is also taken as a mark of heritage and tradition**, serving as an integral part of various cultural events, festivals, and significant ceremonies.

### **The Transfer of Power Ceremony of 1947:**

- Lord Mountbatten, the last Viceroy of India, asked Nehru about "the ceremony that should be followed to symbolise the transfer of power from British to Indian hands".
- **C Rajagopalachari, the last Governor-General of India, told Nehru about a ceremony performed during the Chola dynasty**, in which the transfer of power from one king to the other was sanctified and blessed by high priests.
- **"The symbol (for the transfer of power) used was the handover of the 'Sengol' from one King to his successor.**
- Rajagopalachari was tasked with the responsibility of arranging a sceptre. He reached out to ThiruvaduthuraiAtheenam, a well-known mutt in Tamil Nadu's Tanjore district, and its leader commissioned the manufacturing of the Sengol to Chennai-based "Vummidi Bangaru Chetty" jewellers.
- **The Sengol was constructed by two men VummidiEthirajulu and Vummidi Sudhakar.**
- During the ceremony, which took place on August 14, 1947, a priest gave the sceptre to Lord Mountbatten and then took it back. It was then "taken in procession to Pt Jawaharlal Nehru's house, where it was handed over to him.
- A special song known as **KolaruPadhigam** which was composed by the 7th century Tamil saint **TirugnanaSambandar** was rendered during the event.

- The ceremony was also attended by Rajendra Prasad, the first President of India.

## 8. Symbolism of Sengol

### Subject: History

#### Section: Art & culture

**Context:** The inauguration of India's new Parliament saw an ancient South Indian tradition symbolising a dharmic kingship ceremonially resurrected, when the PM accepted a sengol from priests and installed it near the Lok Sabha Speaker's chair.

#### Concept:

- A **sengol**—or **chengol**—is a **royal sceptre**, signifying **kingship, righteousness, justice, and authority**, among other qualities linked to the correct wielding of power.
- Its **origins lie in TamilNadu**, and it served as a kingly emblem.
- Among the **Madurai Nayakas**, for example, the **sengol was placed before the goddess Meenakshi** in the great temple on important occasions, **and then transferred to the throne room**, representing the **king's role as a divine agent**.
- It was also, therefore, a **legitimising instrument**: the **Sethupatis of Ramnad**, for instance, when they first attained kingly status in the seventeenth century, **acquired a ritually sanctified sengol from priests of the Rameswaram temple**. It marked the **ruler's accountability to the deity in the exercise of power**, as well as his graduation from chiefly status to a more exalted kingly plane. As such, the sengol may be described, in its historical context, as a **symbol of dharmic kingship**.
- Besides, some oral accounts mixed with a few scattered facts say that **Nehru was presented a sengol by Hindu leaders** from TamilNadu in 1947 as a mark of honour, and he, in turn, received it in good spirit.

## 9. 'Utkarsh 2.0'. Medium-term Strategy Framework for 2023-2025 by RBI

### Subject : History

#### Section: Monetary Policy

#### Background:

- RBI in 2015 launched a **strategic management program** to provide a framework for all its future policies and frameworks. Under this framework, the **first strategy framework** titled Utkarsh 2022 was launched, covering the period from 2019-2022.
- It was a 3-year **medium-term roadmap** to improve regulation and supervision by the central bank. It was built in line with the central banks globally to strengthen the supervisory and regulatory mechanism.
- Under it an internal committee was formed, under the aegis of the then deputy governor Viral Acharya.
- Their task was to identify issues that can be addressed in the next three years until 2022. The agenda was to prevent a crisis to the likes of IL&FS and the issues that follow, especially regarding investor confidence.

#### Utkarsh 2.0

- RBI will put in a resilient framework for oversight of Centralised Payment Systems-NEFT and RTGS.
- Upgradation of RTGS, to bring in new functionalities
- **Six vision statements** (from Utkarsh 1.0 are continued) that are designed to improve the performance of the RBI's statutory and other functions
- core purpose in Utkarsh is to foster monetary and financial stability keeping in mind the objective of growth and to ensure the development of an efficient and inclusive financial system

Vision No.	Statement
1	Excellence in the Performance of its Functions
2	Strengthened Trust of Citizens and Institutions in the Reserve Bank of India
3	Enhanced Relevance and Significance in National and Global Roles

4	Transparent, Accountable and Ethics-Driven Internal Governance
5	Best-in-class and Environment-friendly Digital and Physical Infrastructure
6	Innovative, Dynamic, and Skilled Human Resources

## 10. Excavations at Purana Qila

**Subject : History**

**Section: Art and Culture**

**Concept :**

- A recent round of excavations at the site of Delhi's Purana Qila or Old Fort has uncovered evidence of the continuous history of the city since the pre-Mauryan era.

**About Purana Qila:**

- It is located on the South Eastern part of the present city of New Delhi.
- It is one of the oldest forts in Delhi and built on the banks of river Yamuna.
- The present citadel at Purana Qila started its construction in the reign of Humayun and was completed by Sher Shah Suri ('The Lion King').
- The Qila was inspired by Jama Masjid, which was established 15 years before the reconstruction of Qila.

**Architecture:**

- It is rectangular in shape and is spread over an area of 1.5 kilometres.
- Another amazing feature of the Purana Qila are the three gates that are a display of a happy blend of Hindu and Muslim styles of architecture. – Bara Darwaza or the Big Gate facing west, the Humayun Gate facing south, and the Talaqqi Gate, which is often referred to as the forbidden gate.
- All of the gates are double-storeyed and comprise of huge semi-circular bastions flanking either of their sides.
- These bastions are equal in frequency, except for in the westward wall, where they are built at a distance of 73 meters from each other.
- The eastern and western walls of the Qila are the tallest, which were specifically designed for safeguarding the Kings residing within the four-walls.
- All the walls surrounding the Qila are 0.33 meters thick and supported by bastions.

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## International Relations

### 1. Rajnath to hand over patrol vessel, landing craft to Maldives

#### **Subject : International Relations**

#### **Section: Places in news**

#### **Concept :**

- Defence minister of India Rajnath Singh is on a visit to the Maldives from May 1 to 3, 2023 to hold talks with the top leadership of Maldives on various fronts.
- In line with India's commitment to capacity building of friendly countries and partners in the region, **he is expected to hand over one fast patrol vessel and a landing craft to the Maldives National Defence Forces.**
- India's decision to provide the military platforms to the Maldives came amid China's persistent efforts to expand its overall influence in the region.
- In recent years, India's relationship with the Maldives, particularly in the areas of defence and security, has been improving, as the Maldives is an important maritime neighbour for India in the Indian Ocean region.
- **India's vision of SAGAR (Security and Growth for All in the Region) along with its 'Neighbourhood First' policy as well as Maldives' 'India First' policy seek to work together to jointly develop the capabilities within the Indian Ocean region.**

#### **SAGAR (Security and Growth for All in the Region)**

- In 2015, India unveiled its **strategic vision for the Indian Ocean i.e. Security and Growth for All in the Region (SAGAR)**. It is an increasing recognition of the increasing importance of maritime security, maritime commons and cooperation.
- Through SAGAR, India **seeks to deepen economic and security cooperation with its maritime neighbours and assist in building their maritime security capabilities.**
- For this, India would cooperate on the exchange of information, coastal surveillance, building of infrastructure and strengthening their capabilities.
- Further, **India seeks to safeguard its national interests and ensure Indian Ocean region to become inclusive, collaborative and respect international law.**

### 2. Damascus

#### **Subject: International Relations**

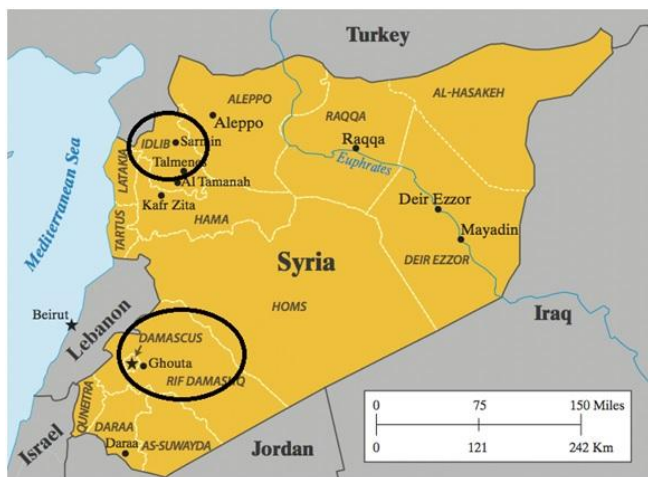
#### **Section: Places in news**

#### **Concept:**

- According to reports, **Iran's president Ibrahim Rai will travel to Syria.**
- Since the beginning of Syria's Civil War in 2011, this will be the first tour of this kind.
- The two-day visit takes place against the backdrop of improved relations between **regional rivals Iran and Saudi Arabia as well as growing Arab engagement with Damascus.**

#### **Damascus**

- It is the **capital of Syria, the oldest capital in the world** and, according to some, the fourth holiest city in Islam.
- Situated in southwestern Syria, Damascus is the center of a large metropolitan area.
- It is nestled among **the eastern foothills of the Anti-Lebanon mountain range** 80 kilometres inland **from the eastern shore of the Mediterranean on a plateau** 680 metres (2,230 ft) above sea level.
- Damascus **experiences a dry climate because of the rain shadow effect. The Barada River flows through Damascus.**



### 3. ASEAN India Maritime Exercise

**Subject : International Relations**

**Section: Msc**

**Concept :**

- The **ASEAN-India Maritime Exercise (AIME-2023)** is an exercise between **Indian Navy and ASEAN navies**.
- The **inaugural edition of the ASEAN-India Maritime Exercise (AIME-2023)** is being held in
- **Aim:** To work closely with each other and conduct seamless operations in the maritime domain.

**Participating Ships:**

- INS Delhi is India's first indigenously-built guided missile destroyer
- INS Satpura is an indigenously-built guided missile stealth frigate.
- Both the ships are part of the navy's Eastern Fleet based in Visakhapatnam.
- The ships will also participate in International Maritime Defence Exhibition (IMDEX-23) and International Maritime Security Conference (IMSC) being hosted by Singapore.

**Significance :**

- With AIME-2023 **India becomes the 4th ASEAN dialogue partner, after Russia, China and the US to hold the ASEAN+1 maritime exercise** in which navies of the Philippines, Cambodia, Myanmar, Malaysia, Singapore, Indonesia, Thailand, Vietnam, Laos, and Brunei.

### 4. UN top prize for 3 Iranian women journalists who reported protests

**Subject : International Relations**

**Section : International Organization**

**Context:** UNESCO marked **World Press Freedom Day** by awarding its annual **World Press Freedom Prize** to three imprisoned **Iranian female journalists**. The winners, **Niloufar Hamedei, Elaheh Mohammadi, and Narges Mohammadi**, were recognized for their work in reporting on **human rights abuses in Iran** and their commitment to truth and accountability.

- The **UNESCO World Press Freedom Prize**, named after **Colombian journalist Guillermo Cano** who was assassinated in 1986, is awarded to those who have made an outstanding contribution to press freedom.
- **UNESCO Director General Audrey Azoulay emphasized the importance of paying tribute to women journalists who are prevented from doing their jobs and who face threats and attacks on their personal safety.**

### 5. India slips to 161 on World Press Freedom Index

**Subject : International Relations**

**Section: International Reports**

**Concept :**

- India's ranking has fallen to 161 in the World Press Freedom Index-2023 in the list of 180 countries. In 2021, India's ranking was 150, down from a ranking of 142 on the press freedom index.

## Key Findings of the Report

- **Toppers:** Norway, Ireland, Denmark, Sweden, Finland, Netherlands, Lithuania, Estonia, Portugal and Timor-Leste occupy the top 10 ranks in the World Press Freedom Index 2023.
- **India's neighbours:** The relative rankings of some countries — Pakistan rose up seven ranks and was placed at 150th, and Afghanistan was ranked 152nd.
- The **World Press Freedom Index** revealed that press freedom in 31 is in a “very serious situation”.
- Two years ago, the number was 21 countries.

## About the Report

- The **World Press Freedom Index Report** is an annual report.
- It is **published by Reporters Without Borders**, a non-governmental organization that advocates for freedom of the press worldwide.
- The **report ranks 180 countries based on their level of press freedom**, taking into account factors such as censorship, media independence, and the safety of journalists.
- The **World Press Freedom Index** is based on **five different factors** that are used to calculate scores and rank countries. These five sub-indicators include the:
  - Political indicator
  - Economic indicator
  - Legislative indicator
  - Social indicator
  - Security indicator

## About RSF

- **Reporters Without Borders** is an international NGO whose self-proclaimed aim is to defend and promote media freedom.
- **Headquartered in Paris**, it has **consultative status with the United Nations**.

## 6. India to build harbour for Maldivian coast guards

**Subject : International Relations**

**Section: India Neighbor**

**Concept :**

- The Indian Defence Minister and his Maldivian counterpart laid the foundation for **“EkathaHarbour”**.

## About EkathaHarbour

- **EkathaHarbour** is being **constructed in the Maldives for the Maldives National Defence Forces Coast Guard**.
- The Harbour is being **constructed at Sifavaru in UthuruThilaFalhu (UTF) atoll**.
- India is assisting the construction of the naval dockyard and it is regarded as one of the biggest grant-in-aid projects of India.
- The Indian Defence Minister also Maldives National Defence Forces Coast Guard an additional Landing Craft **in line with India's vision of Security and Growth for All in the Region (SAGAR)**.
- **Maldives is said to be one of India's crucial maritime neighbours in the Indian Ocean Region (IOR)** and the Indian government is looking to expand ties with Male in areas of defence and security amid China's efforts to expand its influence in the region.
- The Ministers further have agreed to explore additional avenues for cooperation, including in the areas of defence trade, capacity building and joint exercises.

## 7. WTO needs to look at farm subsidy issue with open mind: FM

**Subject :International relations**

**Section: International Organization**

**Context:** Speaking at the Asian Development Bank (ADB) Governor's seminar on 'Policies to support Asia's rebound' FM said that the World Trade Organization (WTO) should look at the issue of farm subsidies with an open mind as it impacts the food security needs of emerging economies in the backdrop of COVID19 and the Russia.

Agri Subsidies and WTO

- In WTO terminology, subsidies in general are identified by “boxes” which are given the colours of traffic lights: green (permitted), amber (slow down — i.e. need to be reduced), red (forbidden).
- The Agriculture Agreement has no red box, although domestic support exceeding the reduction commitment levels in the amber box is prohibited; and there is a blue box for subsidies that are tied to programmes that limit production.
- There are also exemptions for developing countries (sometimes called an “S&D box” or “development box“, including provisions in Article 6.2 of the Agreement).

### Amber box

- Nearly all domestic support measures **considered to distort production and trade** (with some exceptions) fall into the amber box, which is defined in Article 6 of the Agriculture Agreement as all domestic supports except those in the blue and green boxes.
- These include measures to **support prices, or subsidies** directly related to production quantities.
- These supports are **subject to limits**. “**De minimis**” minimal supports for both product-specific and non-product-specific support are allowed, defined as a share of the value of agricultural production.
  - This threshold is generally 5% of the value of agricultural production for developed countries, 10% for most developing countries — although some WTO members agreed to a different level when they negotiated to join the WTO.
  - Furthermore, 32 WTO members with larger subsidies than the de minimis levels at the beginning of the post-Uruguay Round reform period committed to reducing these support levels.
- The reduction commitments are expressed in terms of a “**Total Aggregate Measurement of Support**” (**Total AMS**) which includes all supports for specified products together with supports that are not for specific products, in one single figure. In the Agriculture Agreement, AMS is defined in Article 1 and Annexes 3 and 4.

### Blue box

- This is the “**amber box with conditions**” — conditions designed to reduce distortion.
- Any support that would normally be in the amber box, is placed in the blue box if the support also requires farmers to limit production (details set out in Paragraph 5 of Article 6 of the Agriculture Agreement).
- At present there are no limits on spending on blue box subsidies.

### Green box

- The green box is defined in Annex 2 of the Agriculture Agreement.
- In order to qualify, **green box subsidies must not distort trade**, or at most cause minimal distortion.
- They have to be government-funded (not by charging consumers higher prices) and must not involve price support.
- They tend to be programmes that are not targeted at particular products, and include direct income supports for farmers that are not related to (are “decoupled” from) current production levels or prices.
- They also include environmental protection and regional development programmes.
- “Green box” subsidies are therefore allowed without limits, provided they comply with the policy-specific criteria set out in Annex 2.



### Development Box

- Article 6.2 of the Agriculture Agreement allows **developing countries additional flexibilities in providing domestic support**.

- The type of support that fits into the developmental category are measures of assistance, whether direct or indirect, designed to encourage agricultural and rural development and that are an integral part of the development programmes of developing countries.
- They include investment subsidies which are generally available to agriculture in developing country members, agricultural input subsidies generally available to low-income or resource-poor producers in developing country members, and domestic support to producers in developing country members to encourage diversification from growing illicit narcotic crops.

### De minimis

- The World Trade Organisation (WTO) defines de minimis as the “minimal amounts of domestic support that are allowed even though they distort trade — up to 5% of the value of production for developed countries, 10% for developing”.

### Agreement on Subsidies and Countervailing Measures (SCM)

- The WTO Agreement on Subsidies and Countervailing Measures disciplines the use of subsidies, and it regulates the actions countries can take to counter the effects of subsidies.
- Under the agreement, a country can use the WTO’s dispute-settlement procedure to seek the withdrawal of the subsidy or the removal of its adverse effects. Or the country can launch its own investigation and ultimately charge extra duty (“countervailing duty”) on subsidized imports that are found to be hurting domestic producers.
- All countries that become members of the WTO will automatically be subject to the Subsidies Agreement

## 8. Washington Declaration

### **Subject : International Relations**

#### **Section :Msc**

#### **Concept :**

- South Korean President Yoon Suk Yeol arrived in the U.S. to commemorate the 70th anniversary of U.S.-South Korea bilateral relations.
- A highlight of the visit was the **signing of the “Washington Declaration” as a nuclear deterrence strategy.**

#### **Background**

- The successful launch of North Korea’s Hwasong-8 solid-fuel intercontinental ballistic missile (ICBM), a vital component for nuclear weapons delivery.

#### **About Washington Declaration**

- The agreement outlines cooperation towards deterrence.
- **An American nuclear ballistic submarine would be deployed in the Korean peninsula.**
- A nuclear consultative group would be formed to formulate principles of joint response tactics.
- **South Korea would receive Intel from the U.S. regarding nuclear advancement.**
- **will strengthen South Korea’s nuclear deterrence capabilities** through joint military training programs and an annual intergovernmental simulation.
- **The declaration reaffirmed the non-proliferation Treaty.**

#### **How does it help US?**

- The U.S. is hoping to make North Korea unarm itself by unarming South Korea.
- North Korea creates “deterrence dilemmas for the United States and its Allies and partners,” and “a crisis or conflict on the Korean Peninsula could involve a number of nuclear-armed actors, raising the risk of broader conflict.”
- Finally, the U.S. wants to control global nuclear arms production.

#### **Challenges**

- While the aim is to defuse the threat, physical deployment of the arsenal can be deemed as a direct threat by opposing actors and used as leverage to act aggressively.
- China criticised the agreement saying that it provokes confrontation between camps, undermines the nuclear non-proliferation regime and the strategic interests of other countries.
- North Korea warned that the declaration would, “only result in making peace and security of North-East Asia and the world be exposed to more serious danger.”



## 9. Covid is no longer an emergency

### **Subject : International Relations**

#### **Section: International Organisation**

**Context:** WHO raised its highest level of alert and termed the infection a Public Health Emergency of International Concern, a designation that remained in place for over three years.

#### More on the News:

- **World Health Organisation (WHO)** said that **Covid-19 was no longer a Public Health Emergency of International Concern**, and that the focus would now be on the long-term management of the infection.
- The **novel viral infection came to light after China reported** a cluster of pneumonia cases with no known cause from Wuhan on December 31, 2019. By the end of January 2020, nearly 10,000 cases had been reported, including more than 100 cases in 19 other countries.
- WHO raised its highest level of alert and termed the infection a Public Health Emergency of International Concern, a designation that remained in place for over three years.

#### Why did the WHO declare Covid-19 a pandemic?

- SARS-CoV-2 was a novel virus about which **very little was known** in the initial days. Later, as **many patients reached hospitals** with pneumonia and in need of oxygen support, doctors and researchers discovered that the infection put the immune system into overdrive, **leading to a cytokine storm** when **immune cells started attacking the patient's own organs**. This tended to happen more in the **elderly**, and in those with existing comorbidities like diabetes.
- There are three conditions for declaring a disease a public health emergency.
  - One, it is **spreading across several countries**.
  - Two, it is **leading to serious illness, hospitalisations, and deaths**.
  - Three, **serious stress on health systems** because of the disease.
  - Covid-19 fulfilled all three conditions in 2020 and 2021

#### Why has the WHO removed the designation now?

- **Over the last three years, doctors and researchers have figured out a lot** — methods of transmission; who are at highest risk of severe disease and death; better, cheaper, and point-of-care diagnostics; a **treatment protocol** that works; **medicines to prevent viral replication** that can help in reducing severity of the disease; and most importantly, **vaccines that can prevent severe disease**.
- Governments have **strengthened healthcare systems** and rolled out vaccination drives. **In India, more than 90% of people above the age of 12 years have received their two primary doses**. Since many were infected and vaccinated, the population has developed a **'hybrid immunity'** that has been shown to offer better protection against future severe disease.
- Health systems are no longer stressed. Now **2023 Covid-19 did not satisfy the three conditions for a disease to be a public health emergency**.

#### How will the WHO declaration change disease management?

- There are **no lockdowns; international travel, restaurants, and cinemas are normal**; and containment and control measures haven't been needed for some time now. So, not much will change on ground with the WHO declaration.

## 10. Bastille Day Parade

### **Subject : International Relations**

#### **Concept :**

- Prime Minister Narendra Modi will visit France on 14th of July to attend this year's Bastille Day Parade as Guest of Honour in Paris.

#### **France's Bastille Day parade**

- **July 14 is marked as France's National Day**.
- One of the revolutionary days in Paris and now a national holiday, the **July 14 ("Bastille Day") is celebrated with a mixture of solemn military parades and easygoing dancing and fireworks**.
- The **storming of the Bastille on July 14, 1789** has been commemorated in France for more than a century.

- Every Bastille Day, Paris' famous avenue des Champs-Élysées hosts a **military parade – similar to India's Republic Day parade on Kartavya Path.**
- French heads of state have been the Republic Day guests of honour five times since 1951.
- Prime Minister Narendra Modi will be the 2nd Indian PM to be the guest of honour at Bastille Day, after Manmohan Singh in 2009.

#### About France

- It is the **largest country in Western Europe.**
- It spans Western Europe and overseas regions and territories in the Americas and the Atlantic, Pacific and Indian Oceans.
- France shares borders with **Belgium, Luxembourg, Germany, Switzerland, Monaco, Italy, Andorra, and Spain in Europe, as well as the Netherlands, Suriname, and Brazil in the Americas via its overseas territory in French Guiana.**
- Its overseas territories include **French Guiana in South America, Saint Pierre and Miquelon in the North Atlantic, the French West Indies, and many islands in Oceania and the Indian Ocean.**
- Major mountain ranges: **Alps, Pyrenees, Massif Central**
- Major rivers: **Seine, Rhine and Rhône**

#### 11. King Charles III Coronation

##### **Subject : International Relations**

##### **Section: International Events**

##### **Concept :**

- Britain's King Charles III will join the long list of British queens and kings who have been **crowned at the Westminster Abbey church in London**, when his coronation will take place.
- Since 1066, when the monarch William the Conqueror invaded England with his army and was crowned here, 39 coronation ceremonies and 16 royal weddings have taken place in the cathedral.

##### **History of Westminster Abbey**

- An abbey refers to a religious building, which can either mean a church or a place where monks or nuns live.
- This abbey's story begins with King Edward, also known as Edward the Confessor, who was born in the 11th century into a royal family but was forced to flee his homeland after Danish attacks in the region.
- **Abbey was originally founded around the year 960 as a monastery** on what was then a marshy delta called **Thorney Island, formed where two streams met the river Thames.** Today there is no trace of the land being part of an island.
- The Abbey was consecrated in 1065, but this church was mostly demolished by Henry III around 200 years later to build the present Gothic structure in honour of Edward.
- **King Edward was later made a saint in 1161 by the church after his death.** "His canonisation was essential in creating the holiness of Westminster Abbey as a house of Kings or Queens.
- And starting with Edward, thirty kings and queens have come to be buried here.
- Every Westminster Abbey coronation has taken place in the vicinity of his shrine and, therefore, in the saint's presence, Gross adds.
- Successors were placed in **St Edward's Chair, famously known as the Coronation Chair**, carrying the Stone of Scone, and monarchs are typically crowned with St Edward's Crown.

#### 12. Pakistan and China vow to press ahead with CPEC

##### **Subject : International Relations**

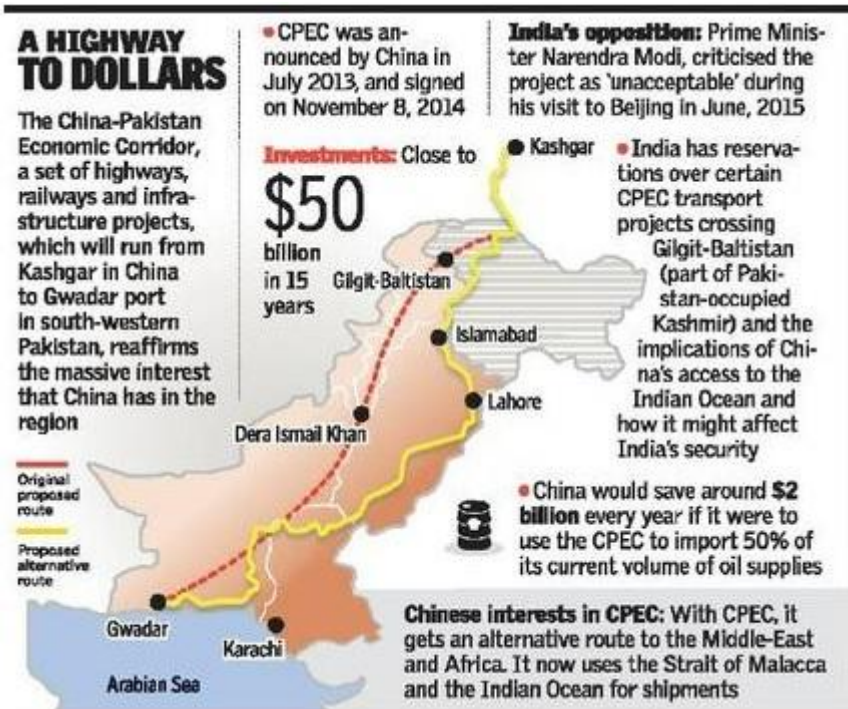
##### **Section: Groupings**

**Context:** Pakistan and China held their fourth edition of the Pakistan-China Strategic Dialogue on Saturday where both affirmed to continue their commitment to the China-Pakistan Economic Corridor (CPEC), a day after India criticised the multi-billion-dollar infrastructure project.

##### **What is CPEC:**

- CPEC is a **3,000-km long** route of **infrastructure** projects connecting **China's northwest Xinjiang Uygur Autonomous Region** and the **Gwadar Port in the western province of Balochistan** in Pakistan.

- It is a **bilateral project between Pakistan and China**, intended to promote connectivity across Pakistan with a network of highways, railways, and pipelines accompanied by energy, industrial, and other infrastructure development projects.
- CPEC is a **part of the Belt and Road Initiative**.
- The proposed **projects in CPEC** will be financed by heavily **subsidised loans** that will be **disbursed to the Government of Pakistan** by Chinese banks.

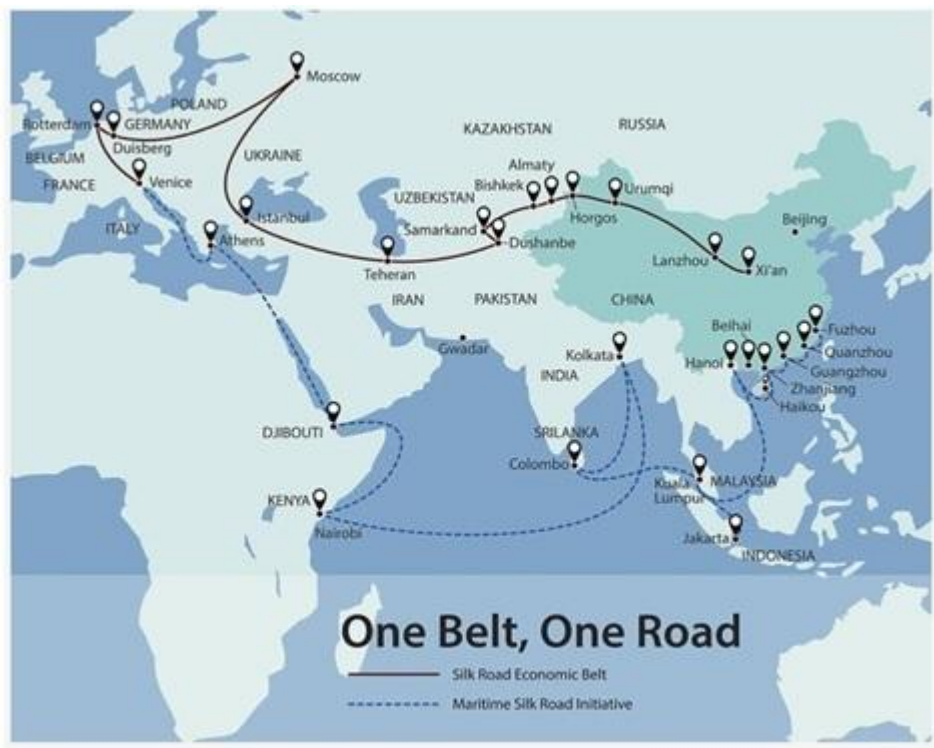


#### What is India's Stand on CPEC:

- India has been **severely critical** of the CPEC, as it passes through **Pakistan-occupied Kashmir**, which is a disputed territory between India and Pakistan.

#### What is Border Road Initiative(BRI):

- Belt & Road Initiative is an **ambitious project** that focuses on **connectivity and cooperation** among **multiple countries** spread across the continents of Asia, Africa, and Europe.
- BRI was **announced in the year 2013**.
- The project has a **target completion date of 2049**, which will coincide with the centennial anniversary of the People's Republic of China (PRC)'s founding.
- The project **involves building networks of roadways, railways, maritime ports, power grids, oil and gas pipelines, and associated infrastructure projects**.
- The project covers **two parts**.
- **Silk Road Economic Belt:** It is **land-based** and is expected to **connect China with Central Asia, Eastern Europe, and Western Europe**.
- **21st Century Maritime Silk Road:** It is **sea-based** and is expected to **connect China's southern coast to the Mediterranean, Africa, South-East Asia, and Central Asia**.



### 13. Indian prisoner dies in Pakistan a week before repatriation

**Subject: International Relations**

**Section: International Convention**

**Concept :**

- An Indian prisoner, who was to be repatriated next week, died in a hospital in Karachi, civil society activists revealed on Sunday.
- The deceased, Zulfiqar, was expected to enter India along with 199 fishermen set to be released by Pakistan.

**Agreement on Consular Access**

- In 2008, India and Pakistan signed the Agreement on Consular Access.
- **Section 4 of the agreement** states that the governments of both nations would provide consular access. This has to be provided within three months to citizens of another country, under arrest, detention, or imprisonment in the other country.
- **Section 5 of the agreement** provides that **within one month of confirmation of the national status and completion of sentences both governments should release and return people.**

**Vienna Convention on Consular Relations of 1963.**

- The Vienna Convention on Consular Relations is an **international treaty that defines consular relations between independent states.**
- A consul, (who is not a diplomat) is a representative of a foreign state in a host country, who works for the interests of his countrymen.
- **Article 36 of the Vienna Convention** states that foreign nationals who are arrested or detained in the host country must be given notice without delay of their right to have their embassy or consulate notified of that arrest.
- If the detained foreign national so requests, the police must fax that notice to the embassy or consulate, which can then verify the person.
- The notice to the consulate can be as simple as a fax, giving the person's name, the place of arrest, and, if possible, something about the reason for the arrest or detention.

### 14 Arab League

**Subject: International Relations**

**Section: International Organization**

**Concept :**



- The Arab League voted to reinstate Syria's membership after its suspension more than 10 years ago, underlining the thawing relations between Damascus and other Arab countries.

### Background

- Syria was ousted from the Arab League in 2011 following President Bashar al-Assad's brutal crackdown on pro-democracy protests, which led to the ongoing civil war in the country.
- The conflict has since killed around half of a million people and displaced about 23 million.
- The ruling, which allows Assad to attend the upcoming Arab League Summit in Saudi Arabia on May 19, has also called for a resolution of the civil war and the resulting refugee and drug smuggling crises.

### Causal factors for reinstatement

- The Arab League's decision is the culmination of Assad's diplomatic efforts to return to the fold, which gained momentum after this February's massive earthquake in Turkey and Syria.
- Assad has received a favourable response from several Arab nations like Egypt and Oman not just because they wanted to help the earthquake victims.
- Experts believe these countries have realised they need to end Damascus' isolation for the stability of West Asia.
- Moreover, they want some sort of repatriation of refugees back into Syria and a **curb on the trade of captagon, a highly addictive amphetamine produced in the country.**
- The international community outside of the region – Russia aside – has largely washed its hands of responsibility for Syria. There is a vacuum and this is where the regional powers have come in.
- Another catalyst in Syria's rehabilitation is the China-brokered re-establishment of diplomatic relations between regional powerhouse Saudi Arabia and its arch enemy, Iran.

### About the Arab League

- Formally the League of Arab States, it is a regional organization in the Arab world, which is located in **Northern Africa, Western Africa, Eastern Africa, and Western Asia.**
- The Arab League was formed in Cairo on 22 March 1945, initially with six members: **Egypt, Iraq, Transjordan, Lebanon, Saudi Arabia, and Syria.**
- The official headquarters of the League was the **Boustan Palace in Cairo.**
- A common market was established in 1965.

### Membership

- Currently, the League has 22 members.
- The Charter of the Arab League, also known as the Pact of the League of Arab States, is the founding treaty of the Arab League. Adopted in 1945, it stipulates that "the League of Arab States shall be composed of the independent Arab States that have signed this Pact."
- **22 member states:** Algeria, Bahrain, Comoros, Djibouti, Egypt, Iraq, Jordan, Kuwait, Lebanon, Libya, Mauritania, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Somalia, Sudan, Syria, Tunisia, United Arab Emirates and Yemen. (**Iran – NOT a Member**)
- **5 observer states:** Armenia, Brazil, Eritrea, **India** and Venezuela.

### 15. Title 42

#### Subject : International Relations

#### Section: International conventions

#### Concept :

- The COVID restrictions, known as **Title 42, will expire at the US-Mexico border;** it was **initially enacted by the former President of the United States Donald Trump in March 2020.**

#### Details of Title 42 Law

- "Title 42" is a **public health order that was invoked by the Trump administration in March 2020 to expel most migrants caught at the U.S.-Mexico border** without allowing them to seek asylum.
- The order was based on the premise that migrants posed a risk of spreading COVID-19 in detention facilities and communities. However, many critics argued that Title 42 was a pretext to restrict immigration and violate human rights.
- Recently, **the USA President announced lifting Title 42.** This means that migrants who cross the border will be able to request asylum, a legal right under U.S. and international law.



- The administration expects a surge in border crossings, as many migrants have been waiting in Mexico or other countries for a chance to enter the U.S.

### Significance

- The **end of Title 42** marks a **significant shift in U.S. border policy, with humanitarian and political implications.**
- On one hand, it **restores the right to seek asylum** for thousands of people fleeing violence, persecution and poverty in their home countries.
- On the other hand, it poses a **challenge for the administration to manage the influx of migrants**, while balancing public health concerns, human rights obligations and public opinion.

## 16. Persona non grata

### Subject : International Relations

#### Section: International conventions

#### Concept :

- A day after Canada announced it would expel a Chinese diplomat over allegations of involvement in a campaign to intimidate a Canadian politician, China on Tuesday (May 9) declared a Canadian diplomat in Shanghai as **persona non grata**.

#### Persona non grata

- In literal terms, the phrase is Latin for “an unwelcome person.”
- The term in a diplomatic sense **refers to a foreign person whose entering or remaining in a certain country is prohibited by that country.**
- The designation received **diplomatic meaning at the 1961 Vienna Convention for Diplomatic Relations.**
- Under **Article 9 of the treaty**, a country can declare any member of a diplomatic staff **persona non grata** “at any time and without having to explain its decision.”
- The persona non grata declaration is the **most damning form of censure a country can bestow on foreign diplomats considering they are protected from arrests and other forms of prosecution under diplomatic immunity.**
- A person declared as such can be recalled from a diplomatic mission or have their functions with the **mission terminated**. If the declared person is not recalled, the country can refuse to recognize the person as part of the mission.
- **Persona non grata can also apply to people who have yet to enter a country.**

## 17. WTO IT Agreement

### Subject : International Relations

#### Section: International Organization

#### Concept :

- The WTO's IT Agreement has done little for India's IT services. India's hardware sector was hit instead.

#### Information Technology Agreement

- India is a **signatory to the Information Technology Agreement (ITA)** (now also known as **ITA-1**), a **plurilateral agreement of WTO**. As on date, there are **altogether 75 member signatories, including 27 EU member countries**, accounting for about 97 percent of the world trade in Information Technology (IT) products.
- India joined the ITA on 25th March 1997.
- During the last year, some of the **developed country members of the ITA – USA, European Union and Japan- have again proposed in the ITA Committee meetings to broaden the scope and coverage of the ITA** (it is being referred as **ITA-2**).
- These proposals basically relate to **increasing the coverage of IT products on which customs duty would be bound at zero; addressing non-tariff measures; and expanding the number of signatory countries to include new signatories such as Argentina, Brazil and South Africa.**
- Proponents of ITA expansion have prepared a **consolidated list containing IT products** (combining products of interest of all proponents of ITA 2), **on which tariff reductions are being sought has been prepared and circulated amongst WTO members**. Same is under active discussions in the WTO these days.

#### India's Experience

- **India's experience with the ITA has been most discouraging**, which almost wiped out **the IT industry from India**. The real gainer from that agreement has been China which raised its global market share from 2% to 14% between 2000-2011.
- In light of recent measures taken by the Government to build a sound manufacturing environment in the field of Electronics and Information Technology, this is the time for us to incubate our industry rather than expose it to undue pressures of competition.
- Accordingly, and also keeping in view opinion of domestic IT industry, it has been decided not to participate in the ITA expansion negotiations for the time being.

## 18. Sahel Region

**Subject: International Relations**

**Section: Regions in new**

**Concept:**

- The ongoing fighting in Sudan is forcing thousands to flee. The humanitarian emergency is spreading, creating a dangerous security situation in **the Sahel region**.

**About Sahel Region**

- The Sahel is the **ecoclimatic and biogeographic realm of transition in Africa between the Sahara to the north and the Sudanian savanna to the south**.
- Having a semi-arid climate, it stretches across the south-central latitudes of Northern Africa between the Atlantic Ocean and the Red Sea.
- The Sahel part of Africa includes **from west to east** parts of northern Senegal, southern Mauritania, central Mali, northern Burkina Faso, the extreme south of Algeria, Niger, the extreme north of Nigeria, the extreme north of Cameroon and Central African Republic, central Chad, central and southern Sudan, the extreme north of South Sudan, Eritrea, and the extreme north of Ethiopia.



## 19. China objects to India's bid to blacklist senior JeM leader at the UN

**Subject : International Relations**

**Section: International Organisation**

**Concept :**

- **India's proposals to blacklist Pakistan-based Jaish-e-Mohammed (JeM) terrorist Abdul Rauf Azhar at the United Nations Security Council (UNSC) were objected to by China.**
- Abdul Rauf Azhar has been involved in planning and executing numerous terror strikes in India which include the hijacking of Indian Airlines aircraft IC814 in 1999, the attack on Parliament in 2001 and the targeting of the IAF base in Pathankot in 2016.
- China objected to the proposal from India to add Abdul Rauf of the JeM to **the UN Security Council's 1267 ISIL and Al Qaida Sanctions list**.
- China had also blocked the proposals to blacklist Pakistan-based terrorists Hafiz Talah Saeed, Lashkar-e-Taiba leader Shahid Mahmood and Lashkar-e-Tayyiba terrorist Sajid Mir in the past.

**UNSC's 1267 Sanctions Committee**

- This Committee was set up based on **resolution 1267 passed in 1999**.

- The **Committee oversees the implementation of the sanctions measures under resolutions 1267, 1989 (2011) and 2253 (2015) concerning ISIL (Da'esh), Al-Qaida, and associated individuals, groups, undertakings and entities.**
- Hence it is also called **ISIL and Al-Qaida Sanctions Committee.**
- The **Committee comprises all 15 members of the Security Council and makes its decision by consensus.** i.e. it consists of both the permanent as well as non-permanent members of the United Nations Security Council (UNSC).
- The Committee designates individuals and entities who meet the listing criteria set out in the relevant resolutions.

#### **Sanctions imposed on individuals who are designated as terrorists by UNSC**

- **Assets Freeze:** All states are mandated to freeze the funds, and financial and economic assets of designated individuals and entities.
- **Travel Ban:** All states are mandated to prevent the entry or transit of these designated individuals through their territories.
- **Arms Embargo:** All states are mandated to prevent the direct or indirect supply, sale and transfer of arms and other materials such as spare parts, technical advice, and training related to military activities to designated individuals.

## **20. WHO declares mpox is no longer public health emergency of global concern**

### **Subject : International Relations**

#### **Section: International Organisation**

**Context:** The director-general of the World Health Organization (WHO), Tedros Adhanom Ghebreyesus, declared that mpox was no longer a Public Health Emergency of International Concern (PHEIC) on May 11, 2023.

#### **More on the News:**

- The announcement came a day after the fifth meeting of the International Health Regulations (2005) (IHR) Emergency Committee.
- Emergency Committee acknowledged the progress made in the global response to the multi-country outbreak of mpox and the further decline in the number of reported cases since the last meeting
- The panel also stressed the integration of mpox prevention, preparedness and response within national surveillance and control programmes, including for HIV and other sexually transmissible infections, as an important element of this longer-term transition.

### **International Health Regulations**

#### **About:**

- While disease outbreaks and other acute public health risks are often unpredictable and require a range of responses, the International Health Regulations (2005) (IHR) **provide an overarching legal framework that defines countries' rights and obligations in handling public health events** and emergencies that have the potential to cross borders.
- The IHR are an **instrument of international law that is legally-binding on 196 countries**, including the 194 WHO Member States. **The IHR grew out of the response to deadly epidemics that once overran Europe.**
- They **create rights and obligations for countries**, including the requirement to report public health events. The Regulations also **outline the criteria to determine whether or not a particular event constitutes a "public health emergency of international concern"**.
- At the same time, the IHR **require countries to designate a National IHR Focal Point for communications with WHO**, to establish and maintain core capacities for surveillance and response, including at designated points of entry.
- Additional provisions address the areas of international travel and transport such as the health documents required for international traffic.
- Finally, the **IHR introduce important safeguards to protect the rights of travellers and other persons in relation to the treatment of personal data, informed consent and non-discrimination** in the application of health measures under the Regulations.

#### **Implementation:**

- The **responsibility** for implementing the IHR **rests upon all States Parties** that are bound by the Regulations and on WHO. Governments are responsible, including all of their sectors, ministries, levels, officials and personnel for implementing IHR at the national level.
- **WHO plays the coordinating role in IHR implementation** and, together with its partners, helps countries to build capacities.
- The IHR **require that all countries have the ability** to do the following:
  - **Detect:** Make sure surveillance systems can detect acute public health events in timely matter
  - **Assess and report:** Use the decision instrument in Annex 2 of the IHR to **assess public health event and report to WHO through their National IHR Focal Point** those that may constitute a public health emergency of international concern
  - **Respond:** Respond to public health risks and emergencies
- **The goal of country implementation is to limit the spread of health risks** to neighbouring countries and to prevent unwarranted travel and trade restrictions.

#### Preparedness:

- WHO's support **focuses on the priority needs identified by the WHO Regional and Country Offices**, in order to help each country meet its IHR commitment. This includes:
  - **designating WHO IHR Contact Points** at the headquarters or the regional level;
  - **conducting global public health surveillance and assessment** of significant public health events;
  - **disseminating public health information** to Member States;
  - **offering technical assistance** to Member States;
  - **supporting Member States in their efforts to assess their existing national public health structures and capacities** for surveillance and response, including at designated points of entry;
  - **monitoring the implementation of IHR** (2005) and updating guidelines; and
  - if required, determining whether or not a particular event constitutes a public health emergency of international concern (PHEIC), with advice from external experts.
- If a PHEIC is declared, **WHO develops and recommends the critical health measures for implementation by Member States** during such an emergency.

#### Monkeypox

- Monkeypox was **first reported in 1958** in laboratory monkeys and the first human case was reported in 1970 in a nine month old baby in the Democratic Republic of Congo.
- **Nigeria reported its first case of monkeypox in humans in 1970** when one case was detected; there were two human cases of monkeypox in Nigeria in 1978.
- And after nearly four decades of not reporting any cases, monkeypox (West African clade) made a re-emergence in Nigeria in September 2017 with a total of 558 cases reported till now.
- In November last year, the **disease's name was changed by WHO from 'monkeypox' to 'mpox' to reduce racial and sexual stigma** surrounding it.

#### Spread:

- Based on epidemiological and clinical characteristics of 122 confirmed or probable cases of human monkeypox cases in Nigeria, researchers found both primary zoonotic and human to human transmission.
- Like all diseases that are **endemic only to Africa**, while efforts were made to prevent an outbreak in the non--endemic countries outside Africa, no serious international attempts were made to stop the outbreak in Nigeria nor study the virus characteristics.
- **The current outbreak in Europe and North America** is the first instance when large scale human to human transmission has been reported outside Africa.
- There **are no clear answers to how humans are infected** as the host animal that behaves as a reservoir for the virus has not been identified in the wild. **And how the virus spreads from animals to humans is not known.**
- The current outbreak appears to have spread primarily among men who have sex with men.
- The **virus is not transmitted through semen or vaginal fluids** but the skin to skin contact during sex can result in virus spread.

#### Low mutation rate

- Till date over 15 monkeypox genomes have been sequenced. But the monkeypox virus has a lower mutation rate (about two mutations a year) compared to nearly 25 mutations in a year in the case of SARS CoV2 virus.
- This is because monkeypox is a DNA virus unlike the SARSCoV2, **which is an RNA virus.**

- It is yet unclear if the virus has acquired the ability of sustained transmission among humans.

## 21. IPEF Negotiations

### **Subject : International Relations**

#### **Section: International Groupings**

Indo-Pacific Economic Framework (IPEF) is a **US led trade agreement** for which negotiations are in the 3<sup>rd</sup> round, with 14 participating countries which includes **Australia, Brunei Darussalam, Fiji, India, Indonesia, Japan, Republic of Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, and Vietnam**

Negotiation heads: 4 heads namely, Trade, Supply chains, clean economy and fair economy. Below are the head wise issues that India should keep in mind while negotiating.

1. **TRADE:** WTO plus approach with US practices in digital trade, labour, environment, agriculture etc forming the basis.
  1. Digital Trade: With virtual space becoming the important for most business activity, government should ensure ownership of national data and not allow BIGTech to have unfair control. India should avoid binding commitments like made with Information Technology Agreement (ITA) 1 which locked India out of electronic manufacturing. Should promote local firms by giving favorable access to data. Not adopt US Artificial Intelligence models as they have biases in-built that may not suit local needs.
  2. Labour Standards: India should avoid US-Mexico style provisions that by mandating minimum wage discourage export of labour intensive products.
  3. Environment standards: India cannot afford to price carbon at the same rate as US, as this will make energy very expensive and thus make our exports uncompetitive.
  4. Agriculture: Not allow GM crops in the name of food security, as most of these are heavily subsidised by countries like the US. Avoid seed monopoly of GM firms. Farmer's right to reproduce and exchange seeds should be ensured.
  5. Transparency and good regulatory practices: in name of transparency India should not give up regulatory and policy autonomy.
  6. Inclusivity and gender: India should use women and MSME participation to get concessions in government procurement.
2. **SUPPLY CHAINS:** Not agree to stop using export restriction clause, as domestic concerns should determine such decisions.
3. **CLEAN ECONOMY:** Not agree to non-derogation clause (non derogation – must be followed no matter what). Should say no to minimum standards for domestic market.
4. **FAIR ECONOMY:** With India already having undertaken several anti-corruption obligations, we should say no to any legally enforceable norms.

#### **GIST of any FTA negotiation with the developed country**

Settle issues at domestic level before undertaking international obligations.

Should not allow standalone obligations like ILO, COP26 to be made part of FTAs like IPEF.

Should resist provisions that undercut, our competitive advantage or that undermine our policy autonomy.

India needs to urgently set up rules/standards in all areas of negotiations at domestic level, so as not to be made to say yes to provisions of IPEF and FTA with EU, UK.

## 22. India helping west meet it's energy demand

### **Subject : International Relations**

#### **Concept :**

- The European Union's (EU) foreign and security policy chief said the EU should crack down on India reselling Russian oil into Europe as refined fuel.

#### **Import from Russia**

- Since Russian invasion of Ukraine, India has emerged as one of the biggest buyers of Russian oil.
- India's imports of Russian oil rose tenfold last year.
- In 2021 Russian oil accounted for just 2% of India's annual crude imports. That figure now stands at almost 20%.



### Export to the west

- The access to cheap crude oil has allowed the country's refiners to register massive profits and export record-level refined petroleum products to Europe and the USA.
- Indian refiners exported an average of around 284,000 barrels per day (bpd) of refined petroleum products to Europe in the December-April period, up from about 170,000 bpd in the year-ago period.

### India's defence

- India has defended its purchase of oil by saying that given its huge reliance on energy imports and with millions living in poverty, it isn't in a position to pay higher prices.
- **Further, Russian crude, if substantially transformed in a third country, is not treated as Russian anymore.**

### Sanctions against Russian oil

- Soon after the Russian invasion of Ukraine, the West started to curtail their dependency on Moscow's energy imports in a bid to squeeze its economy.
- **Germany** : It suspended the launch of the new Nord Stream natural gas pipeline.
- **Canada and the US** : Banned the import of Russian crude oil.
- **Group of seven (G7)** :
  - They enforced a **"price cap" on Russian crude.**
  - They believed the **price cap imposition would cripple Moscow's economy and severely impact its ability to fund its battle against Ukraine.**
- However, **Russia responded by increasing its oil exports to India and China.**

### How India is helping the West meet its energy demand?

- As the sanctions imposed on the import of Russian oil aren't applicable to India, the amount of fuel from Moscow entering the country has reached a record high.
- This has **allowed India to not only easily meet its own energy demands but also that of other countries.**
- **A Bloomberg report noted that India is importing more and more oil from Moscow and refining it into fuel, which is being supplied to Europe and the US.**
- India's diesel exports to the Europe rose 12-16% to 1,50,000-1,67,000 bpd in the last fiscal year.
- India boosted its vacuum gas oil (VGO) shipments to the US.

### Surge of prices

- Currently, **four factors are leading to a surge in the price of oil, coal, and other energy sources.** These are:
  - the disruption of oil supply chains due to the US sanctions on Russia post the Russian invasion of Ukraine,
  - the weakening of the US-Saudi Arabia 1970s deal that led to the dollar becoming the world's reserve currency and leading to the sale of oil and currencies other than the dollar,
  - high inflation in developed countries, including the US, Canada, Germany, and the UK, and
  - the US effort to create alternate supply chains excluding China.

## 23. Papua New Guinea to sign security pact with US

### **Subject : International Relations**

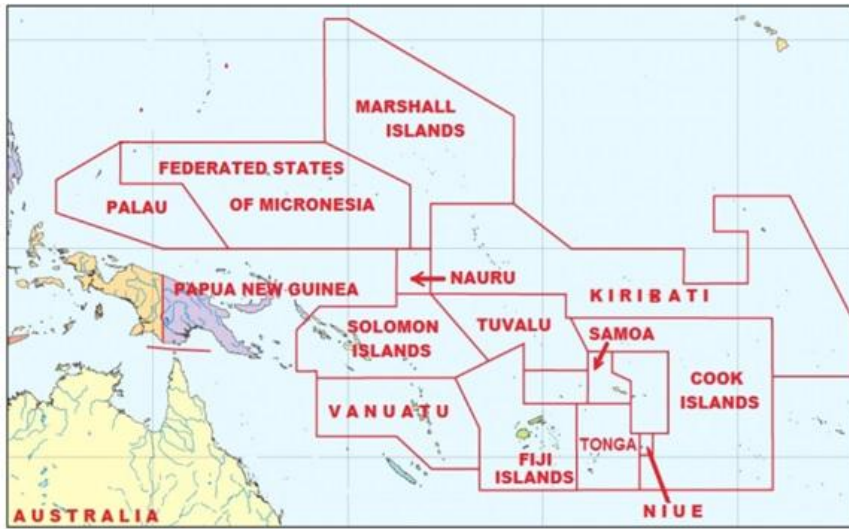
#### **Section: Places in news**

#### **Concept :**

- Prime Minister of Papua New Guinea James Marape said on Thursday that the country will sign a security pact with the US.
- The pact will give US troops access to the Pacific nation's ports and airports. The development has come amid Washington's attempts to jostle for influence in this region with China.

#### **About**

- **Papua New Guinea is a country in Oceania** that comprises the eastern half of the island of New Guinea and its **offshore islands in Melanesia** (a **region of the southwestern Pacific Ocean north of Australia**).
- Its capital, located along its southeastern coast, is **Port Moresby**. The country is the **world's third largest island country**,
- New Guinea's island has shores on both sides with world-famous diving spots and beautiful coral and fish.
- Divers can also dive and find World War II aviation wreckage and shipwrecks. As a result, it is ranked third out of the top ten largest islands globally.



## 24. G7 Hiroshima Summit

### Subject : International Relations

#### Section: Places in news

#### Concept :

- Hiroshima, a city on Japan's main island Honshu, will host this year's Group of Seven (G7) Summit, an annual gathering of the leaders of the world's richest and most industrialised nations.

#### Details

- This year, **Hiroshima will host the Group of Seven (G7) Summit**, an annual meeting of leaders from seven of the world's most powerful democracies: **Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.**
- The summit will take place from May 19 to 21 at a hotel near the Peace Memorial Park.
- The leaders will discuss various global issues and challenges, such as climate change, economic recovery, health security, human rights, and regional stability.

#### Why Hiroshima?

- The choice of Hiroshima as the venue of the G7 Summit reflects **Japan's Prime Minister Fumio Kishida's commitment to put nuclear disarmament and non-proliferation at the forefront of the international agenda.**
- Kishida is a native of Hiroshima and has been a vocal advocate for abolishing nuclear weapons and preventing their proliferation.
- He has also invited leaders from other countries that have been affected by nuclear testing or accidents, such as Kazakhstan, Marshall Islands, Ukraine, and Belarus, to join some sessions of the summit as guests.

#### Background

- Hiroshima was the first city in the world to experience the devastating effects of a nuclear weapon, when an atomic bomb was dropped by the United States on August 6, 1945, near the end of World War II.
- The blast killed tens of thousands of people instantly and left many more injured or sick from radiation exposure.
- The city was almost destroyed, except for a few buildings that survived the firestorm.

#### Present day

- Today, Hiroshima is a vibrant and prosperous regional hub, with a population of about 1.2 million people.
- It is a major industrial, commercial, and cultural centre.
- It is also a symbol of peace and resilience, as it has rebuilt itself from the ashes and dedicated itself to promoting nuclear disarmament and non-proliferation.
- The city hosts several monuments and museums that commemorate the victims of the atomic bombing and educates visitors about its consequences and lessons.



### Atomic Bomb Dome

- One of the most iconic landmarks in Hiroshima is the Atomic Bomb Dome, which was formerly the Hiroshima Prefectural Industrial Promotion Hall.
- It was one of the few structures that remained standing near **the hypocentre of the explosion**, and it has been preserved as a memorial to the tragedy.
- The dome is part of the Hiroshima Peace Memorial Park, which also includes the Children's Peace Monument, the Peace Memorial Museum, and the Cenotaph for the A-Bomb Victims.

### Natural beauty and Cultural heritage

- Hiroshima is also known for its natural beauty and cultural heritage.
- It is surrounded by mountains and sea, and it has many parks and gardens that offer scenic views and relaxation.
- It is famous for its local cuisine, especially okonomiyaki, a savoury pancake with various toppings, and oysters, which are harvested from the nearby **Seto Inland Sea**.
- It is also home to several historical and religious sites, such as **Hiroshima Castle, Shukkei-en Garden, Mitaki Temple, and Itsukushima Shrine**.

## 25. India's women in science and their struggle

### Subject :International relations

#### Section: Neighbouring countries

**Context:** Recent data from the Department of Science and Technology (DST) showed women made up 28% of participants in 2018-19 in extramural Research and Development (R&D) projects, up from 13% in 2000-01

#### Status on Women scientist

- Percentage of women in **R&D is 16.6% among total number of scientists working in S&T organizations**.
- There are **56,747 women scientists directly engaged in R&D activities** out of total 3.42 lakh R&D personnel at various Research & Development (R&D) establishments.
- The proportion of women in the scientific workforce is lower in India than in advanced countries
- Many women are unable to make it because of a lack of funds and opportunities
- the lack of security and safety of the cities and towns limits the options and opportunities for girls to a large extent
- Families, especially those from lower income backgrounds, don't send their daughters for tuitions or coaching to faraway places at odd hours
- women scientists find it difficult to achieve work-life balance, especially in the child-bearing and rearing years

#### Government Initiatives to promote women in S&T:

#### I-STEM (Indian Science Technology and Engineering facilities Map): Women in Engineering, Science, and Technology (WEST)

- It was launched on 5<sup>th</sup> **September 2022 by Office of the Principal Scientific Adviser (PSA)**
- This programme will cater to women **with a STEM background and empower them to contribute to the science, technology, and innovation ecosystem**.

- I-STEM is a national web portal for sharing research equipment/facilities and is the umbrella under which many programmes for promoting collaborations in R&D and technological innovation among and between academia and industry
- Provide a separate platform to scientifically inclined women researchers, scientists, and technologists **for pursuing research in basic or applied sciences in frontier areas of science and engineering.**

#### **Women in Science and Engineering-KIRAN (WISE-KIRAN)**

- Under this, women scientists are being encouraged to pursue research in frontier areas of science and engineering, on problems of societal relevance and to take up S&T-based internship followed by self-employment.
- It primarily aimed at **providing opportunities to women scientists and technologists between the age group of 27-57 years who had a break in their career but desired to return to mainstream.**
- It was implemented by Department of Science & Technology (DST)

#### **Consolidation of University Research through Innovation and Excellence (CURIE) Programme:**

- It provides support for development of research infrastructure and creation of state-of-the-art research laboratories
- To enhance women's participation in S&T domain.
- It was implemented by Department of Science & Technology (DST)

#### **Vigyan Jyoti**

- the “Vigyan Jyoti” has been introduced in the **year 2019-20 at the school level wherein meritorious girl students of Class 9-12 are being encouraged to pursue higher education and career in STEM field.**
- Envisaged hand-holding and interventions right from the school level i.e., **Class IX and which will continue till the PhD level to encourage girls to pursue a career in underrepresented areas of STEM.**
- Various activities such as science camps, special lectures/ classes, counselling of students and parents, interaction with role models, tinkering activities, visit to Knowledge Partners/ Research Labs/ Industries/ NGOs are being conducted in the programme in order to motivate girls.
- It was implemented by Department of Science & Technology (DST)

#### **SERB-POWER (Promoting Opportunities for Women in Exploratory Research)**

- It is a scheme of Science and Engineering Research Board of DST
- It aims to address lower participation of women scientists in research activities and to mitigate gender disparity in science and engineering.

#### **Other Initiatives:**

In addition to this, Department of Biotechnology (DBT) is also implementing ‘**Biotechnology Career Advancement and Re-orientation Programme (BioCARE)**’ to enhance the participation of Women Scientists in Biotechnology research

Government instituted **Janaki Ammal National Women Bioscientist Awards to recognize the contributions of senior and young women scientists in the country who are working in the areas of Biology and Biotechnology.**

Ministry of Earth Sciences **has initiated a special award called “National Award for Woman Scientist” since 2018 which is being conferred to one-woman scientist each year**

#### **26. Pakistan and Iran decided to inaugurate the border market**

**Subject :International relations**

**Section: Neighbouring countries**

**Context:** The top leaders of Pakistan and Iran on Thursday inaugurated the first border market as relations warm between the two countries

**Concept:**

- Border market, **which is located at Mand town in Pakistan's Balochistan province and adjacent to Pishin city in Iran's Sistan-Baluchestan province.**
- Memorandum of Understanding (MOU) **to establish Border Markets along the border was signed between Pakistan & Iran in April 2021.**
- Three Border Markets are now being established at Gabd, Mund&Chedgi in Balochistan, near our border with Iran.”

- these facilities would enhance cross-border trade, foster economic growth and open up new avenues of opportunity for local businesses.

#### Why it has opened now?

- Iran-Pakistani relations have been contentious because of cross-border attacks by Pakistani militants along their shared border
- Small separatist groups have been behind a long-running insurgency calling for Baluchistan's independence from the central government in Islamabad. Pakistani anti-Iran militants have also targeted the Iranian border in recent years, increasing the friction between the two countries
- Pakistan has **close ties with Sunni powerhouse Saudi Arabia, but has tried to maintain a relationship with the predominantly Shiite Iran. Riyadh and Tehran**, long-time rivals, restored ties earlier this year in a Chinese-brokered agreement.

### 27. City of Bakhmut

#### Subject : International Relations

#### Section: Places in news

#### Concept :

- Ukraine's President Volodymyr Zelensky on the G7 platform has denied the claims Russia that said they have captured the city of Bakhmut in Ukraine.

#### Bakhmut in Ukraine

- Bakhmut is a city in eastern Ukraine that has been at the centre of a fierce conflict between Ukrainian and Russian forces since February 2022.
- The city, which lies on the **Bakhmutka River**, is the administrative centre of the Bakhmut Raion district and has a population of about 77,000 people.
- The town is known for its salt industry, which dates back to the 18th century and produces about 200,000 tons of salt per year.
- Bakhmut is also a cultural and educational centre, with several museums, theatres, libraries and schools.
- The town has a rich architectural heritage, featuring buildings from different historical periods and styles, such as Baroque, Classicism, Art Nouveau and Constructivism.
- **The battle for Bakhmut has become a symbol of resistance for Ukraine and a target of conquest for Russia.**
- Both sides have claimed to control the city at different times, but the situation remains fluid and uncertain.
- As of May 2023, Russia says it has fully captured Bakhmut, but Ukraine denies this and says it still holds part of the city and is trying to encircle the enemy forces.
- The international community has condemned Russia's aggression and expressed support for Ukraine's sovereignty and territorial integrity.



### 28. Prime Minister extols value of Pacific island nations at third FIPIC summit

#### Subject : International Relations

#### Section: International Organisations

#### Concept :

- The Prime Minister of India engaged in meetings with leaders from Pacific Island nations as a part of the third Summit of the India-Pacific Islands Cooperation (FIPIC) being held in Papua New Guinea.

#### Details



- The third forum for India-Pacific islands co-operation (FIPIC Summit), which was held today at Port Moresby was jointly hosted with Papua New Guinea.
- Prime minister of India co- chaired the summit with PM of Papua New Guinea.
- The discussions encompassed various areas of cooperation, including commerce, technology, healthcare, and climate change.

#### About FIPIC:

- **Forum for India-Pacific Islands cooperation (FIPIC)** is a multinational grouping for cooperation between India and 14 Pacific Islands nations.
- It include 14 islands named- **Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia, Nauru, Niue, Samoa, Solomon Islands, Palau, Papua New Guinea, Tonga, Tuvalu and Vanuatu.**
- All Head of state/head of government of the above countries met in Suva, Fiji in November 2014 for the first time where the annual summit was conceptualised.
- The FIPIC initiative marks a serious effort to expand India's engagement in the Pacific region.
- A major part of India's engagement with these countries is through development assistance under South-South Cooperation, mainly in capacity building (training, scholarships, grant-in-aid and loan assistance) and community development projects.
- In 2015, FIPIC Trade Office at Federation of Indian Chambers of Commerce & Industry (FICCI) to promote Trade & Investment opportunities between India & Pacific Island Countries.

## 29. How the World Health Organization could fight future pandemics

### **Subject: International Relations**

#### **Section: International Organization**

**Context:** Negotiations on new rules for dealing with pandemics are underway at the World Health Organization (WHO), with a target date of May 2024 for a legally binding agreement to be adopted by the U.N. health agency's 194 member countries

#### **'Zero-draft' of the pandemic treaty:**

- The World Health Organization's (WHO) Intergovernmental Negotiating Body (INB) published a 'zero-draft' of the pandemic treaty on February 1
- It was established based on recognising the "catastrophic failure of the international community in showing solidarity and equity in response to the novel coronavirus disease (COVID-19) pandemic
- the draft noted **"common but differentiated responsibilities and capabilities in pandemic prevention, preparedness, response and recovery of health systems"** as one of its guiding principles
- As per this draft, if and when a pandemic occurs, parties must "take appropriate measures to support time-bound waivers of intellectual property rights that can accelerate or scale up manufacturing of pandemic-related products."
- The draft strengthens this point by **defining what a pandemic means and constituting a time-bound response.**
- As per the draft, **an outbreak is considered a pandemic when an infection spreads quickly globally — with high morbidity and mortality.**
- **Other factors are — infecting immunologically naive human populations, pushing health systems to their capacity and beyond, and triggering social and economic disruptions, where mitigation measures require coordinated efforts across the geographical spectrum.**
- The constitution of a **Pathogen Access and Benefit-Sharing system (PABS) under the WHO is another key element of the draft.**
- **To ensure fair and equitable benefit-sharing, the draft details 20 per cent access for the WHO to pandemic-related products, including diagnostics, vaccines and therapeutics.** Here, 10 per cent each will be designated for donation and sale at affordable prices, respectively.
- **The WHO Global Pandemic Supply Chain and Logistics Network, was also prosed under the draft.**

#### **Criticisms:**

Inclusion of an independent monitoring mechanism to ensure countries comply with the treaty, continues to remain missing,

#### **Background:**

- The WHO already has binding rules known as the **International Health Regulations, which in 2005 set out countries' obligations where public health events have the potential to cross borders**

- These include advising the WHO immediately of a health emergency and measures on trade and travel
- **Adopted after the 2002-2003 SARS outbreak**, these regulations are still considered appropriate for regional epidemics, such as Ebola but inadequate for a global pandemic
- It would be only the second such health accord after the 2003 Framework Convention on Tobacco Control, a treaty which aims to reduce smoking via taxation and rules on labelling and advertising.
- The new **draft of the treaty not clear about the definition of the word “pandemic”**.
- The **new treaty should be complementary, so that existing rules apply to local outbreaks with the new rules kicking in if the WHO declares a pandemic**
- The proposed treaty has come under fire because it could lead to countries ceding authority to the WHO.

#### **Additional Info:**

#### **The International Health Regulations (2005) (IHR):**

- It provide an overarching **legal framework that defines countries’ rights and obligations** in handling public health events and emergencies that have the potential to cross borders.
- **The IHR are an instrument of international law that is legally-binding on 196 countries, including the 194 WHO Member States.** The IHR grew out of the response to deadly epidemics that once overran Europe.
- They create rights and obligations for countries, including the requirement to report public health events.
- The Regulations also outline the criteria to determine whether or not a particular event constitutes a “public health emergency of international concern”.
- The IHR require countries to designate a National IHR Focal Point for communications with WHO, to establish and maintain core capacities for surveillance and response, including at designated points of entry.
- Additional provisions address the areas of international travel and transport such as the health documents required for international traffic.
- The IHR introduce important safeguards to protect the rights of travellers and other persons in relation to the treatment of personal data, informed consent and non-discrimination in the application of health measures under the Regulations.

### **30. NHRC Accreditation by GANHRI**

#### **Subject : International Relations**

#### **Section: International Organisations**

#### **Concept :**

- The **credibility and independence of the National Human Rights Commission of India** have been **questioned by the Global Alliance of National Human Rights Institutions (GANHRI)**, the international body that accredits NHRIs based on their compliance with the UN-mandated Paris Principles.

#### **Details**

- The **National Human Rights Commission of India (NHRC) is a statutory body** that was established in 1993 with the mandate of protecting and promoting human rights in the country.
- The **NHRC-India has been accredited with ‘A status’ by GANHRI since 1999**, which means that it is **fully compliant with the Paris Principles and can participate independently in the UN Human Rights Council and other UN mechanisms**.
- However, in 2016, the NHRC-India’s accreditation was deferred due to some concerns raised by GANHRI’s Sub-Committee on Accreditation (SCA).
- The credibility and independence of the NHRC have been questioned by the Global Alliance of National Human Rights Institutions (GANHRI).

#### **Global Alliance of National Human Rights Institutions (GANHRI)**

- It is a **global network of national human rights institutions (NHRIs)** that aims to promote and protect human rights around the world.
- They are **independent bodies that monitor report and advise on human rights issues in their respective countries**.
- They also **cooperate with regional and international human rights mechanisms**, such as the United Nations Human Rights Council and the Universal Periodic Review.
- **GANHRI is celebrating 30 years of the Paris Principles and 75 years of the Universal Declaration of Human Rights in 2023.** It invites all stakeholders to join its efforts to advance human rights for all.

### 31. World Health Assembly approves draft resolution on health action plan for indigenous people

#### **Subject : International Relations**

#### **Section: International Organisation**

#### **Context:**

- Member states of the **World Health Organization** accepted a draft resolution that proposed developing a **Global Plan of Action for the Health of Indigenous People** during the **World Health Assembly** hosted on May 29, 2023.

#### **Details:**

- **The plan will be up for consideration at the 79th World Health Assembly in 2026.**
- The draft resolution was **proposed by** Australia, Bolivia, Brazil, Canada, Colombia, Cuba, Ecuador, the European Union and its Member States, Guatemala, Mexico, New Zealand, Panama, Paraguay, Peru, the United States of America and Vanuatu.
- The resolution noted that the **indigenous peoples are disproportionately subject to poverty, poor housing, cultural barriers, violence, including gender-based violence, racism, experiencing disability, pollution and lack of access to education, economic opportunities, social protection, water, and sanitation**, as well as **appropriate resilience planning for climate change and natural and other emergencies**.
- **WHO's 194 member states** were urged to develop a **collection of ethical data** to identify **specific requirements of indigenous people** and fill in the gaps.
- They were also urged to have an **intersectional approach** to their politics that overcomes geographical barriers, digital connectivity, information availability, remoteness and disability.
- Another **approach** proposed was to use **evidence-based traditional medicine**, along with medical services offered at the primary healthcare level, which also includes mental health and wellness services.

#### **Status of Indigenous people around the world:**

- The world presently has **476 million indigenous people across the world in about 90 countries**.
- They speak **7,000 languages** and come from **500 different cultures**.
- They are **marginalised individuals without access to basic infrastructure** and oftentimes cannot claim titles over their land and surrounding natural resources.
- The life expectancy of indigenous people is 20 years lower than that of an average person.

#### **United Nations Permanent Forum on Indigenous Issues**

- The **United Nations Permanent Forum on Indigenous Issues** or **Local Communities and Indigenous Peoples Platform (LCIPP)** is an open and inclusive space under the **UNFCCC secretariat** and brings together people and their knowledge systems to build a climate-resilient world for all.
- The **forum** was established in **2000** and provides advice and recommendations on indigenous issues to the Economic and Social Council.
- **Purpose of the platform:**
  - The platform has been established to strengthen the knowledge, technologies, practices, and efforts of local communities and indigenous peoples related to addressing and responding to climate change, to facilitate the exchange of experience and the sharing of best practices and lessons learned on mitigation and adaptation in a holistic and integrated manner and to enhance the engagement of local communities and indigenous peoples in the UNFCCC process.

### 32. WHO Launches Global Network to Detect Infectious Disease Threat

#### **Subject: International Relations**

#### **Section: International Events**

#### **Concept :**

- The World Health Organization has launched a global network to help swiftly detect the threat from infectious diseases, like COVID-19, and share the information to prevent their spread.

#### **About International Pathogen Surveillance Network (IPSN):**

- The International Pathogen Surveillance Network (IPSN) is a **global network of pathogen genomic actors**.
- It is hosted by the **WHO Hub for Pandemic and Epidemic Intelligence**.

- Its aim is to **accelerate progress on the deployment of pathogen genomics and improve public health decision-making.**
- By strengthening the pathogen genomic surveillance ecosystem, the IPSN enables faster detection of new pathogens and the enhanced tracking of the spread and evolution of diseases.
- This in turn can drive better public health responses.
- The IPSN supports ongoing disease surveillance and will help detect and fully characterize new disease threats before they become epidemics or pandemics.
- **Vision/Mission Behind IPSN**
- A world where every country has equitable access to sustained capacity for genomic sequencing and analytics as part of its public health surveillance system.

### Need for an International Surveillance Network for Pathogens

- COVID-19 highlighted the critical role pathogen genomics plays when responding to pandemic threats.
- As pointed out by the WHO that without the rapid sequencing of the SARS CoV-2 virus, vaccines would not have been as effective and would not have become available as quickly.
- New and more transmissible variants of the virus would also not have been identified as quickly.
- WHO said that genomics lies at the heart of effective epidemic and pandemic preparedness and response.
- While the pandemic spurred countries to scale up their genomics capacity, the agency warned that many still lack effective systems for collecting and analysing samples.
- The IPSN would help address such challenges.

### 33. Go First planes : how leased aircraft are repossessed

#### **Subject: International Relations**

#### **Section: International Conventions**

#### **Concept :**

- The Go First has moved the National Company Law Tribunal, seeking voluntary insolvency resolution proceedings.
- Indian airline Go First's effort to start insolvency proceedings has become ensnared in a tussle with aircraft lessors after they asked the aviation regulator to deregister some of its planes using their Irrevocable **De registration and Export Request Authorisation (IDERA)**.
- It empowers lessors to get their aircraft off the registry of the country where the lessee is based, and repossess and fly the plane, in cases like lease payment defaults.
- The cash-strapped airline wants the tribunal to accept its plea and is seeking an interim moratorium to save its assets, a move the lessors oppose.
- Unless Go First can get legal relief that overrides international aviation conventions and protocols, in particular IDERA, it could lose more than a third of its aircraft in about a week.

#### **Cape Town Convention**

- The **Convention on International Interests in Mobile Equipment** was concluded in Cape Town on 16th **November 2001**, as was the **Protocol on Matters Specific to Aircraft Equipment**.
- The Convention and the Protocol, were **adopted under the joint auspices of the International Civil Aviation Organisation (ICAO) and the International Institute for the Unification of Private Law (UNIDROIT)**.
- **ICAO is a United Nations (UN) specialized agency, established in 1944**, which laid the foundation for the standards and procedures for peaceful global air navigation. India is a member.
- **Objective:** To resolve the problem of **obtaining certain and opposable rights to high-value aviation assets**, namely airframes, aircraft engines and helicopters which, by their nature, have no fixed location.
- This problem arises **primarily from the fact that legal systems have different approaches to lease agreements, which creates uncertainty for lending institutions regarding the efficacy of their rights.**
- This hampers the provision of financing for such aviation assets and increases the borrowing cost.

#### **UNIDROIT**

- The **International Institute for the Unification of Private Law (UNIDROIT)** is an **independent intergovernmental Organisation** with its seat in the Villa Aldobrandini in **Rome**.

- Its purpose is to study needs and methods for modernising, harmonising and coordinating private and in particular commercial law as between States and groups of States and to formulate uniform law instruments, principles and rules to achieve those objectives.
- It was established in 1926 as part of the League of Nations.
- It was re-established in 1940 following the League's dissolution through a multilateral agreement, the UNIDROIT Statute.
- It has **63 member countries, with India as a partner.**

## Polity

### 1. Gas leak in Ludhiana: 11 dead, 11 injured; NDRF team at spot to evacuate people

**Subject: Polity**

**Section: MSc**

#### **NDRF**

- The National Disaster Response Force (NDRF) is an Indian specialized force constituted “for the purpose of special response to a threatening disaster situation or disaster” under the Disaster Management Act, 2005
- The “Apex Body for Disaster Management in India is the National Disaster Management Authority (NDMA).
- The Chairman of the NDMA is the Prime Minister.
- The head of the NDRF is designated as Director General. The Director Generals of NDRF are IPS officers on deputation from Indian police organisations. Director General is a three-star officer.
- The NDRF is a top-heavy organisation which in addition to the Director General has several Inspector Generals (IG) and Deputy IGs, who are flag officers and wear badges of rank
- The ‘Nodal Ministry’ in the central government for management of natural disasters is the Ministry of Home Affairs (MHA).
- The responsibility of managing disasters in India is that of the State Government.
- When ‘calamities of severe nature’ occur, the Central Government is responsible for providing aid and assistance to the affected state, including deploying, at the State’s request, of Armed Forces, Central Paramilitary Forces, National Disaster Response Force (NDRF), and such communication, air and other assets, as are available and needed.

#### **Composition of National Disaster Response Force (NDRF)**

- National Disaster Response Force (NDRF) is a force of 12 battalions, organized on para-military lines, and manned by persons on deputation from the para-military forces of India: three Border Security Force, three Central Reserve Police Force, two Central Industrial Security Force, two Indo-Tibetan Border Police and two SashastraSeema Bal.
- The total strength of each battalion is approximately 1149. Each battalion is capable of providing 18 self-contained specialist search and rescue teams of 45 personnel each including engineers, technicians, electricians, dog squads and medical/paramedics.

#### **State Disaster Response Force**

- As per of National Policy on Disaster Management 2009, the State Governments are required to raise their own SDRF for quickly responding to disasters.
- As per information available, 24 State/UTs have raised their SDRF.
- These SDRF are placed strategically at suitable locations well connected to the airport, rail heads and roads for their immediate deployment at the disaster sites.

### 2. Life of 6000 villagers set to improve in Odisha

**Subject :Polity**

**Section: Laws in news**

#### **Concept :**

- Over 6,000 villagers who lived devoid of essential government welfare schemes and developmental benefits for decades deep inside forests in Odisha’s Ganjam district are set to **embrace a new life with the recognition of their villages as revenue villages under the Forest Right Act.**
- These people were part of 38 unsurveyed forest villages and for every small developmental activity, they required permission from the forest department.



- In the census report, these villages are identified as ‘Zero’ villages, but inhabited by people.

### Revenue Villages under FRA

- Under **Section 3(1)(h) of the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006**, the rights of settlement and conversion of all forest villages, old habitations, un-surveyed villages and other villages in forest, whether recorded, notified, or not, **into revenue villages have been recognized as one of the forest rights of forest dwelling Scheduled Tribes and other traditional forest dwellers on all forest lands.**
- As per the provisions of the Act and the rules framed thereunder, **the forest right related to conversion of forest villages into revenue villages is to be adjudicated by the Gram Sabha, Sub-Divisional Level Committee and the District Level Committee as per the laid down procedure**, like any other forest right specified in the Act.
- The Ministry of Tribal Affairs has issued guidelines to the State/ UT Governments to **convert all such erstwhile forest villages, un-recorded settlements and old habitations into revenue villages with a sense of urgency in a time bound manner.**
- The conversion would include the actual land use of the village in its entirety, including land required for current or future community uses, like, schools, health facilities, public spaces etc.

### 3. Scheduled Tribe status for the Meitei community

#### **Subject : Polity**

#### **Section: Constitution**

#### **Concept :**

- **Members of the Meitei community in Manipur**, which has been seeking Scheduled Tribe status for decades, have now said that **they intend to file contempt proceedings against the Hill Areas Committee (HAC) of the Manipur Legislative Assembly**, which recently passed a resolution opposing their inclusion.

#### **What is the issue?**

- The Manipur High Court recently directed the state government to consider a demand to include the Meitei community in the Scheduled Tribes list.
- The order revived old anxieties and further widened ethnic fault lines in the state.

#### **Hill Areas Committee (HAC) of the Manipur Legislative Assembly**

- The HAC was set up through a 1972 order and comprises legislators of all constituencies that fall partly or wholly within the State’s hilly areas.
- The **tribal hill districts of Manipur enjoy special protections under Article 371C** of the Constitution, which says that all laws affecting the districts must be vetted by the hill areas committee of the Manipur Legislative Assembly.

#### **Major tribes of Manipur**

- **Naga and Kuki**: Manipur’s two major tribal communities – **Naga and Kuki** – live in the hill districts, which account for about 90% of the state’s area.
- But these 10 districts send only 20 legislators to the 60-member legislative assembly since they are more sparsely populated than the Valley.
- **Meiteis**: The Meiteis, **who account for 60% of the state’s population**, are largely concentrated in the **Imphal Valley**.

#### **Points made by Meitei Community**

- The community, through the Scheduled Tribe Demand Committee, Manipur, has been demanding ST status for decades now.
- They argue that they had been **listed as one of the tribes of Manipur before it merged with India in 1949 but that they lost this tag when the Constitution (Scheduled Tribes) Order, 1950 was drafted.**
- Claiming that they had thus been left out of the ST list, they had persisted with their demands.

#### **Analyzing protection given to Meitei Community**

- The Meitei community, a **majority of whom follow Hinduism**, is already protected under the Constitution.
- **Most of them are categorised either as Other Backward Classes or Scheduled Castes.**
- The **upper castes among them are also entitled to reservation under the economically weaker section (EWS) quota.**

#### 4. Default bail even if charge sheet has no valid sanction : SC

##### **Subject : Polity**

##### **Section: Judiciary**

##### **Concept :**

- Supreme Court held that **accused persons would not be entitled to default bail on the ground that the charge sheet filed against them is without the sanction of valid authority.**
- **The court held that a charge sheet filed without a valid sanction could not be considered an incomplete charge sheet if it was filed well within the time.**

##### **Background**

- **Section 167 of CrPC provides for default bail** and permits the release of an accused person on bail if the investigation against them is not completed within requisite time.
- The court was hearing appeals against an order of the Punjab and Haryana High Court that refused to release them on default bail under Section 167(2) of CrPC.

##### **About Default Bail:**

- This is a **right to bail that accrues when the police fail to complete investigation within a specified period** in respect of a person in judicial custody.
- It is also **known as statutory bail.**
- This is **enshrined in Section 167(2) of the Code of Criminal Procedure.**

##### **Supreme Court Judgment:**

- In **Bikramjit Singh case 2020**, the Supreme Court had observed that the accused gets an indefeasible right to 'default bail' if he makes an application after the maximum period for investigation of an offence is over, and before a charge sheet is filed.

**Right to default bail under Section 167(2), CrPC not merely a statutory right, but part of procedure established by law under Article 21.**

##### **Underlying Principle:**

- In general, the right to bail on the investigation agency's default is considered an 'indefeasible right', but it should be availed of at the appropriate time.
- **Default bail is a right, regardless of the nature of the crime.**
- **The stipulated period within which the charge sheet has to be filed begins from the day the accused is remanded for the first time.**
- **Under Section 173 of CrPC, the police officer is obligated to file a report after the completion of the necessary investigation of an offence. This report is called the Charge Sheet in common parlance.**
- **Time Period:**
- **The issue of default bail arises where it is not possible for the police to complete an investigation in 24 hours, the police produce the suspect in court and seek orders for either police or judicial custody.**
- **For most offences, the police have 60 days to complete the investigation and file a final report before the court.**
- **However, where the offence attracts death sentence or life imprisonment, or a jail term of not less than 10 years, the period available is 90 days.**
- **In other words, a magistrate cannot authorise a person's judicial remand beyond the 60-or 90-day limit.**
- **At the end of this period, if the investigation is not complete, the court shall release the person "if he is prepared to and does furnish bail".**
- **Special Cases:**
- **The 60- or 90-day limit is only for ordinary penal law. Special enactments allow greater latitude to the police for completing the probe.**
- **In the Narcotic Drugs and Psychotropic Substances Act 1985, the period is 180 days, which can be extended up to one year.**
- **In the Unlawful Activities (Prevention) Act 1967, the default limit is 90 days only, which can be extended to another 90 days.**
- **This extension can be granted only on a report by the Public Prosecutor indicating the progress made in the investigation and giving reasons to keep the accused in continued detention.**
- **These provisions show that the extension of time is not automatic but requires a judicial order.**

## 5. Article 142

### **Subject : Polity**

#### **Section: Judiciary**

#### **Why in News?**

A five-judge Constitution Bench of the Supreme Court ruled that it can exercise its plenary power to do “complete justice” under Article 142, to directly grant divorce to couples.

#### **What is Article 142?**

- Article 142 provides **discretionary power to the Supreme Court (SC)**. Subsection 1 of Article 142 states that the SC 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. Any decree so passed or order so made shall be enforceable throughout the territory of India.
- If at times law or statute did not provide a remedy, the Court can extend itself to put an end to a dispute in a befitting manner.
- An order to do complete justice must be **consistent with the fundamental rights** and **cannot be inconsistent with the substantive provisions of the relevant statutory laws**.
- Used in judgements related to cleaning of Taj Mahal, release of A.G. Perarivalan, Bhopal gas tragedy case, etc.

#### **Current Procedure for Divorce**

- Governed by the Hindu Marriage Act (HMA), 1955 – “divorce by mutual consent”.
- **Section 13B of the HMA – First petition** to be filed to the **district court** on the ground of living separately for 1 year or more, unable to live together and mutually consenting for dissolution of marriage.
- **Section 13B(2) of the HMA – Second motion** to be filed by the parties before the court – **between 6 and 18 months** of presenting first petition. First petition not withdrawn in the meantime. The mandatory **6 month wait** – intended to give **time to withdraw** the plea.
- Court will pass a decree of divorce, if it’s satisfied, after proper hearing of parties and inquiry
- **Section 14 of HMA** – divorce petition can be moved **sooner than mandatory 1 year** period after marriage due **exceptional hardship** of petitioner or **exceptionally bad moral** of the partner. **6 months** cooling-off period for getting decree of divorce can be **waived off** in this case.

#### **Conditions for using Article 142 for divorce cases**

- A person **cannot directly approach the SC and seek dissolution of marriage** on the ground irretrievable breakdown. It can be used only as a remedy for a competent court’s judgement. Writ jurisdiction under **Articles 32 and 226 cannot be used** to circumvent due procedure.
- The decision to exercise the power under Article 142(1) should be **based on** considerations of **fundamental general conditions of public policy** and **specific public policy**. The fundamental general conditions of public policy include fundamental rights, secularism, federalism and other basic features of Constitution. The specific public policy was defined by the court to mean “some express pre-eminent prohibition in any substantive law.”

#### **Article 32 – right to constitutional remedy**

- It is a **fundamental right**, stating that individuals have the right to approach the SC to seek enforcement of other fundamental rights guaranteed by the Constitution.
- The SC has power to issue directions or orders or **writs** including **habeas corpus, mandamus, prohibition, certiorari and quo-warranto** for enforcing any of the fundamental rights.
- This is an **original but not exclusive** jurisdiction of SC. It is **concurrent** with high court’s jurisdiction under **Article 226**.

#### **Article 226**

Not a fundamental right but a **constitutional right** that empowers a **High Court (HC)** to issue writs including habeas corpus, mandamus, certiorari, prohibition and quo warranto, for enforcing any of the fundamental rights or for any other purpose. For any other purpose means – **enforcing ordinary legal right** also. So HC has **wider writ jurisdiction than SC**.

#### **Consequences of the Judgement**

- SC is not bound by the procedural requirement to move the second motion.

- SC can waive off the 6 month mandatory wait for getting a divorce decree in exceptional case of irretrievable breakdown of marriage.

### **Factors to decide Irretrievable Breakdown of Marriage**

#### **SC determined the following factors**

- The period of time that the parties had cohabited after marriage;
- When the parties had last cohabited;
- Nature of allegations made by the parties against each other and their family members;
- Orders passed in the legal proceedings from time to time;
- Cumulative impact on the personal relationship;
- Whether, and how many attempts were made to settle the disputes by a court or through mediation, and when the last attempt was made.

### **6. A good divorce : SC Ruling**

#### **Subject : Polity**

#### **Section: Constitution**

#### **Concept :**

- The Supreme Court's (SC) ruling on divorce matters on 1st May 2023 is seen as a good move to opt out of a bad marriage.
- **The Supreme Court of India has invoked its extraordinary powers under Article 142 of the Constitution to grant divorce by mutual consent to couples trapped in bitter marriages, without making them wait for the mandatory cooling-off period of six to 18 months prescribed by law.**
- It should be noted that according to Section 13B of the Hindu Marriage Act, 1955, a couple has to wait for 6 to 18 months for a local court to annul the marriage.

#### **Highlights of the Supreme Court Observation**

- The court observed that **there is no point in compelling the parties to go through the futile exercise of filing a petition under Section 13B(1) of the Hindu Marriage Act, 1955 or under Section 28 of the Special Marriage Act, 1954**, as the case may be, and then wait for another six months if they have already taken a conscious decision to part ways.
- The court said that such a situation may lead to mental cruelty and cause more harm than good to the parties involved.
- The court also clarified that this power will be exercised only in exceptional cases where there is no chance of reconciliation and both parties have mutually agreed to end their marriage.
- The court said that it will examine each case on its facts and circumstances and not lay down any general guidelines or criteria for granting divorce by mutual consent under Article 142.

#### **Consensual Divorce**

- Consensual divorce is a **type of divorce that is based on the mutual agreement of both spouses to end their marriage legally and peacefully.**
- It is the **shortest, least expensive and least harmful way of a divorce**, as it avoids prolonged litigation, bitter disputes and emotional trauma.
- It also benefits the children of the divorcing couple, as it reduces their exposure to parental conflict and helps them cope with the transition.

#### **Consensual divorce law in India**

- In India, consensual divorce can be obtained under two laws: the **Hindu Marriage Act 1955 and the Special Marriage Act 1954.**
- **Both these laws provide for a mutual consent divorce**, where the spouses have to file a joint petition in the court and satisfy the following conditions:
- They have been living separately for at least one year.
- They have not been able to live together and have mutually agreed to dissolve their marriage.
- They have settled all their issues regarding alimony, custody, maintenance, etc.
- They have given their consent voluntarily and without any coercion or undue influence.
- The court will verify the consent of the parties and try to reconcile them. If the court is satisfied that the conditions are met and there is no possibility of reconciliation, it will grant a decree of divorce by mutual consent.

## Article 142 of the Constitution

- **Article 142 of the Constitution** empowers the **Supreme Court's verdicts and rulings to be enforced**.
- It prescribes that in the performance of its jurisdiction, the **top court may issue any verdict or order necessary to provide "complete justice" in just about any case before it**.
- This power is meant to **supplement the existing legal work and not supplant it**.
- It is conceived to meet situations which cannot be effectively and appropriately tackled by the existing provisions of law.

## 7. Alternative To Death by Hanging

### **Subject : Polity**

#### **Section: Judiciary**

#### **Concept :**

- In the Supreme Court, the Union Government stated that it is considering the **formation of a committee to investigate the need for a painless and more dignified alternative to death by hanging**.
- This move could potentially end the barbaric and inhuman practice of executing death row convicts by hanging them by the neck until they are dead.
- **Hanging is not only cruel and painful, but also violates the fundamental right to life and dignity of the condemned prisoners.**
- Hanging as a **mode of execution has been challenged several times in the past** because it is **inconsistent with Article 21 of the Constitution**, which guarantees the right to life and personal liberty.

#### **Background of the Present Context**

- A petition was filed in the Supreme Court seeking to abolish hanging and adopt other methods such as lethal injection or electrocution, which he claimed are comparatively less painful and more humane.
- **The Supreme Court, in March 2023, directed the Centre to gather information on the less painful modes of execution than hanging by the neck in death sentence cases in the country.**
- The court also suggested that the Centre could set up an expert panel to examine the issue from the standpoint of science and technology and find an approach that is both humane and socially acceptable.

#### **Alternatives for death by hanging**

- Alternatives for death by hanging are **lethal injection, firing squad and electrocution**. These **methods are used in some other countries that still retain capital punishment** However, each of these methods has its drawbacks and controversies.
- A **lethal injection** may cause severe pain and suffering if the drugs are not administered properly or if the prisoner has a medical condition that affects the effectiveness of the drugs.
- A **firing squad** may result in a prolonged and bloody death if the shooters miss the vital organs or if there are multiple rounds of firing.
- **Electrocution** may cause severe burns, mutilation and disfigurement of the body.
- Therefore, **there is no clear consensus on which method of execution is the most humane and dignified.**

#### **Death Penalty**

#### **Death Penalty in the Indian Context**

- Prior to the Criminal Procedure (Amendment) Act (Cr PC) of 1955, the death penalty was the rule and life imprisonment an exception in India.
- Further, the courts were bound to give an explanation for awarding a lighter penalty than death for capital offences.
- After the amendment of 1955 courts were at liberty to grant either death or life imprisonment.
- As per **Section 354 (3) of the Cr PC, 1973** the courts are required to state reasons in writing for awarding the maximum penalty.
- The situation has been reversed and a life sentence is the rule and death penalty an exception in capital offences.
- Moreover, despite a global moratorium against the death penalty by the UN, India retains the death penalty.



- India is of view that allowing criminals guilty of having committed intentional, cold-blooded, deliberate and brutal murders to escape with a lesser punishment will deprive the law of its effectiveness and result in travesty of justice.
- In concurrence of this, a proposal for the scrapping of the death penalty was rejected by the Law Commission in its 35th report 1967.

#### **The Indian Penal Code prescribes ‘death’ for offences such as**

- Waging war against the Government of India. (Sec. 121);
- Abetting mutiny actually committed (Sec. 132);
- Giving or fabricating false evidence upon which an innocent person suffers death. (Sec. 194);
- Murder (Sec. 302);

#### **Other criminal statutes that provide for the death penalty as a form of punishment:**

- Direct or indirect abetment of sati is punishable with Death penalty under the Commission of Sati (Prevention) Act, 1987.
- Under SC and ST (Prevention of Atrocities Act), 1989 giving false evidence leading to the execution of an innocent member belonging to the SC or ST would attract the death penalty.
- The POCSO Act was amended with five new clauses, including death sentence for aggravated penetrative sexual assault by a person in a position of authority—which includes police officers, members of the armed forces and public servants.
- Financing, producing, manufacturing as well as the sale of certain drugs attracts the death penalty for repeat offenders under the Narcotic Drugs and Psychotropic Substances Act, 1985.
- Unlawful Activities (Prevention) Act, 1967; Army, Navy and Air Force Acts also provide the death penalty for certain specified offences committed by members of the armed forces.

### **8. Model Code of Conduct (MCC)**

#### **Subject: Polity**

#### **Section: Elections**

#### **Why in News?**

Taking note of the plummeting levels of discourse in the Karnataka Assembly election campaign, the Election Commission (EC) issued an advisory to all recognized national and state parties to maintain “the expected level of dignity”, particularly with respect to their designated star campaigners.

#### **What is MCC?**

- The MCC is a **set of guidelines issued by the Election Commission (EC)** to regulate political parties and candidates prior to elections. Basically, the code spells out the do’s and don’ts for elections.
- This is in keeping with Article 324 of the Constitution, which mandates EC to conduct free and fair elections to the Parliament and State Legislatures.
- It is **not statutory** but Political Parties, Candidates and Polling Agents are expected to observe the norms, on matters ranging from the content of election manifestos, speeches and processions, to general conduct etc.
- The code comes into force on the announcement of the poll schedule and remains operational till the process is concluded.
- The EC has devised several mechanisms to take note of the violation of the code, which include joint task forces of enforcement agencies and flying squads.

#### **Legal Enforcement**

- Though MCC does not have any statutory backing, but the Code has come to acquire teeth in the past decade because of its strict enforcement by the EC.

- Certain provisions of the MCC may be enforced through invoking corresponding provisions in other statutes such as the Indian Penal Code, 1860, Code of Criminal Procedure, 1973, and Representation of the People Act, 1951.
- In 2013, the Standing Committee on Personnel, Public Grievances, Law and Justice, recommended making the model code of conduct legally binding. It recommended that the MCC be made a part of the Representation of the People Act, 1951.
- **The EC argues against making it legally binding.** According to it, elections must be completed within a relatively short time or close to 45 days, and judicial proceedings typically take longer, therefore it is not feasible to make it enforceable by law.

## Some of the Provisions of MCC

### Prohibitions

- Criticism of political parties must be limited to their policies and programmes, past record, and work.
- Activities such as using caste and communal feelings to secure votes, criticizing candidates on the basis of unverified reports, bribing or intimidation of voters, etc. are prohibited.

### Star Campaigners

- A star campaigner is a celebrity vote seeker in an election for a party. This person can be anyone, a politician or even a film star. A 'recognised' National or State party declared as such by the ECI can nominate a maximum of 40 star campaigners. An unrecognised political party can nominate a maximum of 20 star campaigners.
- The ECI keeps a tab on expenditure incurred by individual candidates during campaign – Rs. 70 lakh for most states in one constituency by each candidate. Expenditure incurred on electioneering by the star campaigner is not added to a candidate's poll expenditure giving him/her more scope for expenditure. According to the Representation of People's Act, 1951 these expenses will be borne by the political parties.
- However, for an individual candidate to get relief from campaign expenditure, the star campaigner has to limit oneself to general campaigning for the party. EC also advised the parties and their candidates to exercise caution and restraint in their utterances.

## 9. Citing report, SC declines Rajoana's mercy plea

### Subject : Polity

### Section: Judiciary

**Context:** The Supreme Court found it inappropriate to direct the government to **commute the death penalty** of **Balwant Singh Rajoana** — who is on death row for the 1995 assassination of former Punjab Chief Minister Beant Singh — in view of the **Home Ministry's conclusion that a decision on the mercy petition now would impact national security**

### Mercy petition

- The mercy petition talks about the power to pardon the convict under a few sections of the criminal code of procedure.
- Mercy Petition lies in saving an innocent person from being punished due to miscarriage of justice or in cases of doubtful conviction.

### Constitutional backing:

- Under **Article 72 of the Constitution**, the President has the power to grant pardons and decide on mercy petitions.
- Under **Article 161 of the Indian Constitution**, the Governor of State also possess the power to grant pardons, reprieves, respites and remission or suspend, remit or commute the sentence of a convict against state law.

### Procedure to apply for mercy petition:

- A convict under the sentence of death is allowed to file a mercy petition within a period of seven days after the date on which the Superintendent of Jail informs him about the dismissal of the appeal or special leave to appeal by the Supreme Court.
- The petitions are to be **presented to the President of India**. The President office seeks the cabinet advice.
- The **appeal is examined by the Ministry of Home Affairs** and the Ministry before giving recommendations to the President, takes the view of State concerned.
- There is **no written procedure to deal with mercy petition**.

### Judicial review:

- President's pardon/rejection/delay is also subjected to judicial review.
- However, if a court finds that the process of the decision taken by the President under Article 72 was not arbitrary or unreasonable; the decision then cannot be interfered with.
- A **curative petition is the last judicial corrective measure** which can be pleaded in any judgment or decision passed by the Supreme Court which is normally decided by Judges in-chamber.

### Who else can give pardon?

- In *Dhananjoy Chatterjee alias Dhana v State of West Bengal*, 1994 case the Supreme Court has said that "The power under Articles 72 and 161 of the Constitution can be exercised by the Central and State Governments, not by the President or Governor on their own".
- The advice of the appropriate Government binds the Head of the state.

## 10. Prevention Of Sexual Harassment (Posh) Act 2013

### Subject : Polity

#### Section : Acts / legislation news

#### Concept :

- **Half of India's national sports federations don't have a sexual harassment panel**, as required by the **Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, 2013**.

#### Details

- According to a study, half of India's national sports federations do not have a sexual harassment tribunal as the law requires.
- This violates the **Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act of 2013**, which requires **every firm with more than ten workers to create an internal complaints commission (ICC) to handle sexual harassment allegation**.

#### **Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act of 2013**

- The Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, often known as the PoSH Act, was passed in 2013.
- The Act defines sexual harassment as any unwelcome act or behaviour (whether directly or by implication) such as;
  - Physical contact and advances
  - A demand or request for sexual favours
  - Making sexually coloured remarks
  - Showing pornography
  - Any other unwelcome physical, verbal or non-verbal conduct of sexual nature.
- The Act provides a mechanism for the prevention, prohibition, and redressal of complaints of sexual harassment in the workplace.

#### Key Provisions

- The Act **covers both organised and unorganised sectors**, and **applies to all women**, irrespective of their age or employment status.
- Domestic workers, students, research scholars, patients, customers, clients, and tourists are also included.
- Offices, factories, stores, hotels, restaurants, educational institutions, hospitals, sports facilities, transportation services, entertainment venues, and houses are all covered by the Act.

#### **Internal Complaints Committee (ICC)**

- Every employer is required to constitute an **Internal Complaints Committee (ICC) at each office or branch with 10 or more employees**.
- **At least one-half of the members of the ICC should be women**.
- The ICC is made up of a **presiding officer** (a senior woman employee), **two other workers** (ideally committed to women's rights), and **one external member** (from an NGO or legal background).
- The ICC is in charge of receiving and investigating complaints of sexual harassment from female employees and proposing appropriate action to the employer.

#### **Local Complaints Committee (LCC)**

- The Act also provides for the **constitution of a Local Complaints Committee (LCC) by the District Officer** for cases where the **complaint is against the employer or where the workplace has less than 10 workers.**
- According to law, a **Company having more than 10 employees is mandated to constitute an Internal Complaints Committee (ICC).**
- For a **company having less than 10 employees, it is not mandatory to have ICC.**
- Any woman who has been subjected to sexual harassment at the workplace can file a complaint within 3 months of the incident or series of incidents to the ICC or LCC, as applicable.
- The LCC has the same powers and functions as the ICC.

#### **Investigation and Action**

- The ICC or LCC is required to **complete the inquiry into the complaint within 90 days** and submit a report with its recommendations to the employer or district officer.
- The **employer or district officer is required to take action on the recommendations of the ICC or LCC within 60 days** and inform the complainant and respondent about it.

#### **Protection against false Complaints**

- The Act provides for penalties for false or malicious complaints, non-compliance with the provisions of the Act by the employer or ICC or LCC members, and victimization or retaliation against the complainant or witness.

### **11. Justice Balakrishnan Commission**

#### **Subject : Polity**

#### **Section: Constitution**

#### **Concept :**

- Former Chief Justice of India K. **Balakrishnan, who heads the Inquiry Commission into whether Dalit converts to religions other than Sikhism or Buddhism should get Scheduled Caste status**, said his panel could deliver its report in a year, and that too before the election year of 2024.

#### **Details**

- The Union Government has appointed a **three-member commission, headed by former Chief Justice of India K G Balakrishnan**, to consider the possibility of granting SC status to “new persons who have historically belonged to the Scheduled Castes” but have converted to religions other than Hinduism, Buddhism and Sikhism.

#### **Need Of The Commission:**

- The new commission has been set up at a time when the Supreme Court is hearing a PIL filed by the **National Council of Dalit Christians (NCDC)**, which has been **fighting for SC status since 2020** — there have been numerous other cases filed in the apex court on the matter since 2004. In August, the Supreme Court had directed the Centre to submit its current position on the issue.
- The **contention of Dalit Christian and Muslim organisations has been that these communities continue to face discrimination.** But, these organisations criticised the latest move by the Centre as a “delaying tactic”.
- The commission will also examine the implications of any decision in this matter on existing SCs, and the changes they go through on converting to other religions in terms of customs, traditions, social and other discrimination, and deprivation.

#### **Constitution Order of 1950**

- When enacted, the Constitution (Scheduled Castes) Order of 1950, initially provided for recognizing only Hindus as SCs, to address the social disability arising out of the practice of untouchability.
- The **Order was amended in 1956 to include Dalits who had converted to Sikhism and once more in 1990 to include Dalits who had converted to Buddhism.**
- Both amendments were aided by the reports of the **Kaka Kalelkar Commission in 1955 and the High-Powered Panel (HPP) on Minorities, Scheduled Castes, and Scheduled Tribes in 1983 respectively.**
- The 1950 Order (post amendments in 1956 and 1990), **mandates that anybody who is not a Hindu, Sikh or Buddhist cannot be granted SC status.**
- **Ranganath Report 2007**
- The recommendation of Scheduled Caste reservation for Dalit converts to Christianity and Islam was made in the 2007 report of the **Justice Ranganath Mishra Commission for Religious and Linguistic Minorities.**

- Dalit Christians and Muslims face discrimination not only from upper-caste members of their own religion but also from the broader Hindu-dominated society.
- The exclusion of Dalit converts to Christianity and Islam from the SC category violates the constitutional guarantee of equality and is against the basic tenets of these religions, which reject caste discrimination.
- The denial of SC status to Dalit converts to Christianity and Islam has led to their socio-economic and educational backwardness and has deprived them of access to reservations in education and employment opportunities (as provided under article 16).

#### Centre Stand :

- The **Centre had discredited the report**, but the apex court believes it contains valuable information that could help determine if excluding Dalit converts from the SC category is unconstitutional according to the Constitution Order of 1950.

### 12. HC don't have powers to direct changes to ST list : CJI

#### Subject : Polity

#### Section: Constitution

#### Concept :

- The Chief Justice of India questioned why a 23-year-old Constitution Bench decision that clearly stated that no court or state has the authority to “add, subtract, or modify” the Scheduled Tribes List was not “shown” to the Manipur High Court.

#### Details

- The Chief Justice stated that a **High Court does not have the authority to make amendments to the Scheduled Tribes List. Designating a Scheduled Caste or Scheduled Tribe is a Presidential authority.**
- The Constitution Bench in State of Maharashtra v/s Milind (2000) concluded that State governments, courts, tribunals, or any other body have no authority to modify, amend, or alter the list of Scheduled Tribes (STs).

#### Background

- In a recent case, the **Manipur High Court declared that a community called Meitei/Meetei, which is not included in the STs list, should be considered a Scheduled Tribe.**
- **The court also directed the state government to initiate the process of inclusion of this community in the list.**
- The protest against the order of the High Court resulted in the violence and death of more than 60 people.
- The Manipur High Court decision was challenged in the **Supreme Court, which stayed the order of the High Court.**

#### The Supreme Court Observation

- The **Supreme Court also observed that the Manipur High Court had overlooked a landmark judgment of a five-judge Constitution Bench in 1997, which clearly stated that no court or state has the authority to “add, subtract, or modify” the Scheduled Tribes List.**
- The Chief Justice of India, who was heading the bench hearing the case, **questioned why this judgment was not “shown” to the Manipur High Court.**
- Chief Justice remarked that such judicial interference in matters of policy and legislation would create chaos and confusion.

#### Scheduled Tribes List

- It is a **constitutional document that recognizes the rights and privileges of certain communities in India** that are considered to be historically disadvantaged and marginalized.
- **The list is not static but can be amended by the Parliament of India under Article 342 of the Constitution.**
- **Process of adding to the ST List:**
- The **process of adding tribes to the ST list starts with a recommendation from the State governments.**
- It is **sent to the Tribal Affairs Ministry, which reviews and sends them to the Registrar General of India, Under the Home Ministry for approval.**
- After approval, it is **sent to the National Commission for Scheduled Tribes and then sent to the Cabinet for a final decision.**



- Once the **cabinet finalizes it, then it introduces a bill in the parliament** to amend the Constitution (Scheduled Castes) Order, 1950, and the Constitution (Scheduled Tribes) Order, 1950.
- After the amendment bill is passed by both the Lok Sabha and Rajya Sabha, the President's office takes the final decision under Articles 341 and 342 of the Constitution.

### 13. Same sex couple, live in partners not included on surrogacy laws

#### **Subject :Polity**

#### **Section :Constitution**

#### **Concept :**

- Centre on Tuesday informed the Supreme Court that live-in partners and same-sex couples cannot be allowed to avail of services under the surrogacy law.
- **The Court has decriminalized same-sex relations and live-in relations however neither any special provisions have been introduced with respect to same-sex/live-in couples nor have they been granted any additional rights**, Centre informed the Supreme Court.

#### **Surrogacy Act 2021**

- The Act sought to regulate the surrogacy part of a rather flourishing infertility industry in the country.
- It is defined as a **practice where a woman undertakes to give birth to a child for another couple and agrees to hand over the child to them after birth.**

#### **Altruistic surrogacy:**

- The **Act allows 'altruistic surrogacy'** — wherein only the medical expenses and insurance coverage is provided by the couple to the surrogate mother during pregnancy.
- **No other monetary consideration will be permitted.**

#### **The intending couple:**

- Any couple that has 'proven infertility' is a candidate.
- The 'intending couple' as the Act calls them, will be eligible if they have a 'certificate of essentiality' and a 'certificate of eligibility' issued by the appropriate authority.
- The former will be issued if the couple fulfills three conditions:
  - A certificate of infertility of one or both from a district medical board;
  - An order of parentage and custody of the surrogate child passed by a Magistrate's court;
  - Insurance cover for the surrogate mother.

#### **Eligibility Certificate:**

- An eligibility certificate mandates that the couple fulfil the following conditions:
  - They should be Indian citizens who have been married for at least five years;
  - the female must be between 23 to 50 years and the male, 26 to 55 years;
  - they cannot have any surviving children (biological, adopted or surrogate);
  - However, this would not include a 'child who is mentally or physically challenged or suffers from life threatening disorder or fatal illness.'

#### **Surrogate mother:**

- Only a close relative of the couple can be a surrogate mother, one who is able to provide a medical fitness certificate.
- She should have been married,
  - with a child of her own, and
  - must be between 25 and 35 years,
  - but can be a surrogate mother only once.

#### **Regulating Body:**

- **The Centre and State governments are expected to constitute a National Surrogacy Board (NSB) and State Surrogacy Boards (SSB) respectively.**
- This body is tasked with enforcing standards for surrogacy clinics, investigating breaches and recommending modifications.

- Further, surrogacy clinics need to apply for registration within 60 days of the appointment of the appropriate authority.

#### Offences:

- **Offences under the Act include commercial surrogacy, selling of embryos, exploiting, abandoning a surrogate child etc.**
- **These may invite up to 10 years of imprisonment and a fine of up to Rs. 10 lakh.**

### 14. The law on polygamy among religious groups in India

#### **Subject :Polity**

#### **Section: Constitution**

**Context:** ASSAM CHIEF MINISTER Himanta Biswa Sarma has said that the state government will move to ban the practice of polygamy through “legislative action”, and that an “expert committee” would be formed to examine the issue.

#### **Prevalence of polygamy**

The National Family Health Survey-5 (2019-20) showed the prevalence **of polygamy was 2.1% among Christians, 1.9% among Muslims, 1.3% among Hindus, and 1.6%** among other religious groups.

The data showed that the highest prevalence of polygynous marriages was in the North-eastern states with tribal populations. A list of 40 districts with the highest polygyny rates was dominated by those with high tribal populations.

#### **Concept:**

Polygamy is the practice of having more than one married spouse—wife or husband. The issue is governed both by personal laws and the Indian Penal Code (IPC).

Traditionally, polygamy—mainly the situation of a man having more than one wife was practised widely in India.

#### **Polygamy under various laws:**

##### **Under Hindu law**

After Independence, anti-bigamy laws were adopted by provincial legislatures including Bombay and Madras. The Special Marriage Act, 1954, was a radical legislation that proposed the requirement of monogamy.

Sub section (a) of Section 4 of the SMA (“Conditions relating to solemnization of special marriages”) requires that “at the time of marriage...neither party has a spouse living”. **Parliament passed the Hindu Marriage Act in 1955, outlawing the concept of having more than one spouse at a time.** Buddhists, Jains, and Sikhs are also included under the Hindu Marriage Code.

Section 5 (“Conditions for a Hindu marriage”) of the Hindu Marriage Act lays down that “a marriage may be solemnized between any two Hindus, if [among other conditions] neither party has a spouse living at the time of the marriage Under Section 17 of the HMA bigamy is an offence, “and the provisions of sections 494 and 495 of the Indian Penal Code, 1860, shall apply accordingly”.

However, despite bigamy being an offence, the child born from the bigamous marriage would acquire the same rights as a child from the first marriage under the law.

#### **Exception to the bigamy law for Hindu:**

**A crucial exception to the bigamy law for Hindus is Goa,** which follow its own code for personal laws. So, a Hindu man in the state has the right to bigamy under specific circumstances that are mentioned in the *Codes of Usages and Customs of Gentile Hindus of Goa*.

These circumstances include a case where the wife fails to conceive by the age of 25 or if She fails to deliver a male child by the age of 30.

The Parsi Marriage and Divorce Act, 1936, had already outlawed bigamy.

##### **Under Muslim law**

Marriage in Islam is governed by the **Shariat Act, 1937**. Personal law allows a Muslim man to have four wives.

To benefit from the Muslim personal law, many men from other religions would convert to Islam to have a second wife.

In a landmark ruling in **1995**, the Supreme Court in *Sarla Mudgal v Union of India* held that religious conversion for the sole purpose of committing bigamy is unconstitutional.

This position was subsequently reiterated in the **2000** judgment in *Lily Thomas v Union of India*.

Any move to outlaw polygamy for Muslims would have to be a special legislation which overrides personal law protections like in the case of triple talaq.

### 15. National Medical Commission

**Subject : Polity**

**Section: Msc**

**Concept :**

- The **National Medical Commission (NMC)** has relaxed its norms for a year, allowing foreign medical graduates who have passed their screening test to intern at non-teaching hospitals.
- The allotment of FMGs in these non-teaching hospitals shall also be done through concerned state medical councils
- The “clarification” issued by the National Medical Commission on Wednesday states that the **two-year internship will be applicable only to candidates who came back to India during their final year and completed their education online because of the Covid-19 pandemic or the Russia-Ukraine war.**

**About National Medical Commission**

- The government dissolved the MCI in 2018 and replaced it with a Board of Governors (BoG), which was chaired by a member of NITI Aayog.
- Now, the IMC Act, 1956 stands repealed after the gazette notification, and has been replaced by **The National Medical Commission Act that came into existence on 8th August 2019.**
- The change is aimed at bringing in reforms in the medical education sector and especially aimed at replacing the MCI, which was tainted by corruption and other problems.
- **The NMC will function as the country’s top regulator of medical education.**
- It will **have four separate autonomous boards** for:
  - Undergraduate medical education.
  - Postgraduate medical education.
  - Medical assessment and rating.
  - Ethics and medical registration.
- The common final year Bachelor of Medicine and Bachelor of Surgery (MBBS) examination will now be known as the **National Exit Test (NEXT)**, according to the new medical education structure under the NMC.
- NEXT will act as **licentiate examination to practice medicine, the criteria for admission to postgraduate medical courses, and also for screening of foreign medical graduates.**
- Besides, the National Eligibility and Entrance Test (NEET), **NEXT will also be applicable to institutes of national importance such as all the All India Institutes of Medical Sciences (AIIMS) in a bid to ensure a common standard in the medical education sector in the country.**
- NEET is conducted by the National Testing Agency (NTA).

### 16. Delhi govt. has control over officers, says Supreme Court

**Subject : Polity**

**Section: Federalism**

**Concept :**

- On 11th of May 2023, the Supreme Court said that the **National Capital Territory (NCT) of Delhi has legislative and executive power over administrative services in the National Capital, other than the matters relating to public order, police and land.**
- According to the Supreme Court, the Delhi government, much like other States, represents the representative form of government and **any further expansion of the Union’s power will be contrary to the Constitutional scheme.**

**Details**

- A Constitution Bench of the Supreme Court headed by the Chief Justice of India held that the **Lieutenant-Governor (L-G) can exercise executive power on behalf of the Centre only in the three areas of public order, police and land in Delhi as mentioned in Article 239AA(3)(a).**

- The Bench said that **the L-G does not have sweeping executive powers over the national capital, and the Centre should be mindful of the unique “asymmetric federal model” of governance adopted for Delhi.**
- The court also noted that the sui generis (special status) granted to Delhi should align with “**cooperative federalism**”.

#### **Control over Administrative Services:**

- In 2019, a two-judge bench of the SC delivered a split verdict on the aspect of who controls administrative services in Delhi.
- The two-judge bench had recommended that a three-judge bench be set up to decide the issue of control of administrative services.
- Further, in May 2022, a three-judge Bench had referred this case to a larger Bench on the Central government’s plea.
- The three-judge Bench had decided that the question of control over administrative services required “further examination”.

#### **Central & State Government’s Arguments:**

- The Central Government has consistently maintained that because Delhi is the national capital and the face of the country, it must have control over administrative services, which include appointments and transfers.
- On the other hand, the Delhi government has argued that in the interest of federalism, the elected representatives must have power over transfers and postings.
- **The Delhi government had also contended that the recent amendments to the Government of National Capital Territory of Delhi (Amendment) Act, 2021, violate the doctrine of basic structure of the Constitution.**

#### **Legal Issues before the SC**

**There were two legal issues before the court –**

- The first arises from **a reference made by a two-judge Bench in February 2019.**
- While deciding on the distribution of powers between the Delhi government and Centre, left the question of who will have control over the administrative services for consideration by a larger Bench.
- Second issue is the **Government of National Capital Territory of Delhi (Amendment) Act 2021, passed by the Parliament.**
- The Act provided that the term “government” referred to in any law made by the Legislative Assembly of Delhi will imply the Lieutenant Governor (L-G).
- However, the Delhi government has challenged the constitutional validity of the Act.

#### **Articles 239AA:**

- Article 239AA of the Constitution of India **granted Special Status to Delhi among Union Territories (UTs) in the year 1991 through the 69th constitutional amendment by the Parliament.**
- It provided a **Legislative Assembly and a Council of Ministers responsible to such Assembly.** Delhi was named as ‘**National Capital Region (NCT) of Delhi**’.
- As per **Article 239AA – Public Order, Police & Land in NCT of Delhi fall within the domain and control of Central Government** which shall have the power to make laws on these matters.
- **For remaining matters of State List or Concurrent List**, in so far as any such matter is applicable to UTs, **the Legislative Assembly shall have the power to make laws for NCT of Delhi.**
- As per **Article 239AA (4)**, in the case of a difference of opinion between the **Lt. Governor and his Ministers on any matter, the Lt. Governor shall refer it to the President for decision and act according to that decision.** In the meantime, if the Lt. Governor thinks that the matter is urgent he can take immediate action on his own.

#### **Government of NCT of Delhi (Amendment) Act 2021**

- The Act basically gives more power to the Lieutenant Governor (LG) of the National Capital Territory of Delhi and diminished the elected government’s power.
- The Act also seeks to bring in some clarity on certain subjects in the Government of National Capital Territory of Delhi Act, 1991.
- The Act makes amendments to the Government of National Territory of Delhi Act, 1991.
- It gives more power to the LG in some respects while ensuring the Delhi Legislative Assembly’s accountability.

- As per the Act's objects and reasons, it is aimed at ending the absence of clarity on what matters or proposals are needed to be submitted to the LG before orders could be issued.
- It also aims to "further define the responsibilities of the elected government and Lieutenant Governor (LG) in Delhi".

### GNCT Act Provisions

- Some of the important provisions of the Government of NCT of Delhi (Amendment) Act, 2021 are discussed below:
- The term 'government' mentioned in any law enacted by the legislative assembly of Delhi shall mean the LG. The Act defines 'government' as the LG.
- The Act provides discretionary powers to the LG even in matters where the Legislative Assembly is empowered to make laws.
- An additional clause added to Section 44 of the 1991 Act makes it mandatory for the government to obtain the opinion of the LG on all matters before any executive action can be taken, ensuring accountability.
- This means that the state government or cabinet would need to seek the LG's opinion before implementing any decision.
- The amendment also says that the "Legislative Assembly shall not make any rule to enable itself to consider the matters of the day-to-day administration of the Capital or conduct inquiries in relation to the administrative decisions".

### 17. SC Ruling on Sena vs Sena

**Subject : Polity**

**Section: Parliament**

**Concept :**

- The Supreme Court has passed a unanimous judgement on the various issues related to the split in Shiv Sena in June 2022.
- While passing the judgement, the apex court made strong observations about the role of the then Governor of Maharashtra and the Speaker of the Legislative Assembly.
- The court, however, refrained from interfering with the proceedings related to disqualifying 16 MLAs, including Chief Minister Eknath Shinde.

### **Matter referred to five-judge Constitution Bench**

- In August 2022, a three-judge SC bench led by then CJI N V Ramana referred the questions arising out of petitions filed by rival camps to a five-judge Constitution Bench.
- It said that the **Nabam Rebia verdict** requires gap filling to uphold constitutional morality.

### **What is 2016 Nabam Rebia judgment?**

- In Nabam Rebia case (2016), the SC held that a speaker will be disabled from deciding disqualification petitions under the anti-defection law (10th schedule of the constitution) if a notice for their removal is pending.
- In other words, this judgement stopped a speaker facing removal notice from deciding disqualification pleas against members of legislatures under anti-defection law.

### **What SC said in ruling on Sena tussle?**

#### **Disqualification of MLAs**

- The Supreme Court said it cannot interfere in the proceedings and the Speaker of the Maharashtra Assembly must decide on the issue of the disqualification of the 16 MLAs.

#### **On restoring Uddhav Thackeray govt**

- The SC held since Uddhav Thackeray resigned as the chief minister and did not face the floor test, his government cannot be reinstated.
- It said, had Thackeray refrained from resigning from his post, the court could have restored his government.
- The court also held that the decision of the governor in calling Shinde to administer him an oath as CM was justified.

#### **On governor's role in calling floor test**



- The court held that by calling the floor test, the then Maharashtra governor did not act in accordance with the law as he had no objective material to doubt the confidence of the Thackeray government in the House.
- The court said the Governor had acted upon an inference that a section of the Shiv Sena wished to withdraw their support to the government.
- However, the communication by some of the MLAs only expressed discontent about the Maha Vikas Aghadi alliance.
- It said that the power of the Governor to act without the aid and advice of the Council of Ministers is of an extraordinary nature, and must be exercised with circumspection within the limits of law.
- It also said that the **Governor is not empowered to enter the political arena and play a role in inter or intra party disputes.**

#### **Appointment of whip from Shinde group illegal**

- It said the appointment of the chief whip by a political party is crucial to the Tenth Schedule and the system will crumble if it is not complied with.
- The Tenth Schedule of the Indian Constitution is also known as the Anti-Defection Law. It was added to the Constitution in 1985 through the 52nd Amendment Act.
- It also held that the speaker should have conducted an independent inquiry to identify two whips issued by (the two factions) the political party.

#### **Speaker and EC can adjudicate issues concurrently**

- The court said it could **not accept the contention that the EC was barred from deciding on the party symbol dispute until the Speaker decided the disqualification pleas before him.**
- The court said this would amount to indefinitely staying proceedings before the ECI.
- This is because the Speaker's decision would attain finality only after the appeals against his decision were disposed of.

#### **Referral of issues in Nabam Rebia judgement to larger bench**

- The five-judge bench referred certain issues related to its 2016 judgment in the Nabam Rebia case to a larger bench.
- One of the issues is whether a notice for removal of a Speaker would restrict the powers of the Speaker to issue disqualification notices to MLAs.

### **18. Supreme Court on default bail**

#### **Subject : Polity**

#### **Section: Judiciary**

#### **Concept :**

- The Supreme Court of India has directed lower courts to decide on pending default bail applications without relying on its own judgment of April 26.
- In the Ritu Chhabaria versus Union of India case, the Supreme Court held that central agencies cannot deny accused persons their right to default bail by filing multiple supplementary chargesheets and seeking renewed custody.
- The judgment held that **“the right of default bail under Section 167(2) of the Criminal Procedure Code (CrPC) is not merely a statutory right, but a fundamental right that flows from Article 21 of the Constitution”** to protect accused persons from the “unfettered and arbitrary power of the State”.

#### **Significance of the order:**

- A judgment of the Supreme Court is considered the law of the land. **Article 141** of the Constitution provides that the law declared by the Supreme Court shall be binding on all courts within India.
- After the Ritu Chhabaria judgment was delivered, the Enforcement Directorate (ED) filed an urgent application in the Supreme Court to “recall” the verdict.
- The ED contended that the judgment contradicted past rulings of the Supreme Court. The ED also filed an appeal against the default bail granted to Manpreet Singh Talwar, an accused in a money laundering case who had relied on the Ritu Chhabaria verdict, arguing that the judgment would not apply to special laws such as the Prevention of Money Laundering Act.
- The Supreme Court clarified that lower courts can decide on default bail applications independently of its judgment in the Ritu Chhabaria case.

## 19. Model Prisons Act 2023

### **Subject : Polity**

#### **Section: Legislation in news**

#### **Concept :**

- The Union government has announced that it has prepared a Model Prisons Act to replace the current 130-year-old law i.e., Prisons Act, 1894.
- This is done in order to shift the focus of incarceration from retributive deterrence to reform and rehabilitation.

#### **Prisons Act, 1894 (Objectives, Need for a Law)**

- The present '**Prisons Act, 1894**' is a **pre-independence era Act** and is almost 130 years old.
- The Act mainly focuses on keeping the criminals in custody and enforcement of discipline and order in prisons.
- There is no provision for reform and rehabilitation of prisoners in the Act.
- In the last few decades, an altogether new perspective has evolved about prisons and prison inmates, globally.
- Prisons today are not looked as places of retributive deterrence but are considered as reformative and correctional institutions where the prisoners are transformed and rehabilitated back into society as law abiding citizens.
- As per the provisions of Constitution of India, 'prisons'/'persons detained therein' is a 'State' subject.
- The responsibility of prison management and prisoners' administration solely vests with State Governments who alone are competent to make appropriate legislative provisions in this regard.
- However, given the critical role that efficient prison management plays in the criminal justice system, the Government of India attaches high degree of importance to supporting the States/UTs in this regard.

#### **About Model Prisons Act, 2023:**

- A need was felt to revise and upgrade the Act in tune with modern day needs and requirements of prison management.
- Hence, a decision was taken to by the Central government to review and revise colonial-era outdated Prison Act, in tune with contemporary modern day needs and correctional ideology.
- **The Ministry of Home Affairs assigned the task of revision of the Prisons Act, 1894 to the Bureau of Police Research and Development.**
- The Bureau, after holding wide ranging discussions with State Prison authorities, correctional experts etc. prepared a draft.
- Along with Prisons Act, 1894, 'The Prisoners Act, 1900' and 'The Transfer of Prisoners Act, 1950' have also been reviewed by the Ministry of Home Affairs and relevant provisions of these Acts have been assimilated in the 'Model Prisons Act, 2023.'
- State Governments and Union Territory Administrations can benefit from the Model Prisons Act, 2023 by adopting it in their jurisdictions, with such modifications which they may consider necessary, and repeal the existing three Acts in their jurisdictions.

#### **Salient Features**

- **Security:** Provision for security assessment and segregation of prisoners, individual sentence planning, grievance redressal, prison development board, attitudinal change towards prisoners.
- **Accommodation:** Provision of separate accommodation for women prisoners, transgender, etc.
- **Technology:** Provision for use of technology in prison administration with a view to bring transparency in prison administration.
- Provision for video conferencing with courts, scientific and technological interventions in prisons, etc.
- Provision of punishment for prisoners and jail staff for use of prohibited items like mobile phones etc. in jails.
- **Open jail:** Provision regarding establishment and management of high security jail, open jail (open and semi open), etc.
- **Protection for society:** Provision for protecting the society from the criminal activities of hardened criminals and habitual offenders, etc.
- **Legal aid:** Provision for legal aid to prisoners, provision of parole, furlough and premature release etc. to incentivise good conduct.
- **Skill development:** Focus on vocational training and skill development of prisoners and their reintegration into the society.

## 20. Post-SC verdict; all eyes on Maharashtra Speaker Narwekar

### **Subject : Polity**

#### **Section: Parliament**

#### **Concept :**

- With the Supreme Court on Thursday ruling in the Maharashtra political row case that “the Speaker must decide on the disqualification petitions within a reasonable period”, all eyes are now on Speaker Rahul Narwekar.
- The five judge Bench of the Supreme Court did not decide on the disqualification petitions filed by former Chief Minister Uddhav Thackeray.
- The court held Mr. Narwekar’s decision recognising Bharat Gogawale, a candidate of the Shinde group, as the Chief Whip of the Shiv Sena “illegal”.

#### **About Whip**

- A whip is a **directive from the party that binds party members of a House to obey the line of the party.**
- Though the **office of whip is not officially recognised in the standing orders, there has been a long tradition to give them a place in the Parliamentary form of government.**
- The whip plays a crucial role in ensuring the smooth and efficient conduct of business on the floor of the House.
- The **whip is an MP/MLA drawn from the party that is in power and also from the party that sits on the opposition bench.** They are vital in maintaining the links between the internal organisation of party inside the Parliament.
- It is also the **duty of the chief whip to maintain discipline of the party on the floor of the House.** Besides, he is responsible for keeping MPs, especially Ministers, informed of opinion in the party on the moods of individual members.
- If an **MP/MLA violates his party’s whip, he faces expulsion from the House under the Anti-Defection Act.**
- **Constitutional status:** The office of ‘whip’, is **mentioned neither in the Constitution of India nor in the Rules of the House nor in a Parliamentary Statute.** It is based on the conventions of the parliamentary government.
- **Non-applicability of Whip:** There are some cases such as **Presidential elections where whips cannot direct a Member of Parliament (MP) or Member of Legislative Assembly (MLA) on whom to vote.**

#### **Disqualification under Anti defection**

- The **Tenth Schedule** contains the **following provisions with respect to the disqualification of members of Parliament and the state legislatures on the ground of defection:**
- **Members of Political Parties:** A member of a House belonging to any political party becomes disqualified for being a member of the House, (a) if he voluntarily gives up his membership of such political party; or (b) if he votes or abstains from voting in such House contrary to any direction issued by his political party without obtaining prior permission of such party and such act has not been condoned by the party within 15 days.
- **Independent Members:** An independent member of a House (elected without being set up as a candidate by any political party) becomes disqualified to remain a member of the House if he joins any political party after such election.
- **Nominated Members:** A nominated member of a House becomes disqualified for being a member of the House if he joins any political party after the expiry of six months from the date on which he takes his seat in the House.

#### **Speaker Power**

- Any question regarding disqualification arising out of defection is to be decided by the presiding officer of the House.
- Originally, the act provided that the decision of the presiding officer is final and cannot be questioned in any court. However, in **KihotoHollohan case (1993)**, the **Supreme Court declared this provision as unconstitutional on the ground that it seeks to take away the jurisdiction of the Supreme Court and the high courts.**
- It held that the presiding officer, while deciding a question under the Tenth Schedule, function as a tribunal. Hence, his decision like that of any other tribunal, is subject to judicial review on the grounds of mala fides, perversity, etc.

- The presiding officer of a House is empowered to make rules to give effect to the provisions of the Tenth Schedule. All such rules must be placed before the House for 30 days. The House may approve or modify or disapprove them.
- According to the rules made so, **the presiding officer can take up a defection case only when he receives a complaint from a member of the House.**
- Before taking the final decision, he must give the member (against whom the complaint has been made) a chance to submit his explanation.
- He may also refer the matter to the committee of privileges for inquiry. Hence, defection has no immediate and automatic effect.

## 21. Karnataka DGP Praveen Sood to be next Director of CBI

**Subject: Polity**

**Section: National Organisation**

**Context:** Karnataka Director General of Police Praveen Sood on Sunday was appointed as the next director of the Central Bureau of Investigation for a two-year tenure

**Details:**

Sood's name was recommended by a selection committee comprising Prime Minister Narendra Modi, Chief Justice DY Chandrachud, and Leader of the Opposition in Lok Sabha Adhir Ranjan Chowdhury on Saturday.

**Director of CBI**

- Director, CBI as Inspector General of Police, Delhi Special Police Establishment, is responsible for the administration of the organization.
- Till 2014, the CBI Director was appointed on the basis of the DSPE Act, 1946.
- In 2003, DSPE Act was revised on Supreme Court's recommendation in the Vineet Narain case.
- A committee that had members from Central Vigilance Commission, Secretaries from Home Ministry, Ministry of Personnel and Public Grievances would send recommendations to Central Government for the appointment of CBI Director.
- In **2014, the Lokpal Act provided a committee for appointment of CBI Director:**
- Headed by **Prime Minister**
- Other members – **Leader of Opposition/** Leader of the single largest opposition party, **Chief Justice of India/** a Supreme Court Judge.
- Home Ministry sends a list of eligible candidates to DoPT. Then, the DoPT prepares the final list on basis of seniority, integrity, and experience in the investigation of anti-corruption cases, and sends it to the committee.
- Director of CBI has been provided **security of two year tenure**, by the CVC Act, 2003.

## 22. Late Bail orders and Right to Personal Liberty

**Subject : Polity**

**Section: Constitution**

**Concept :**

- The Supreme Court has recently held that bail orders should neither be too long and elaborate nor come too late as both violate the constitutional mandate of personal liberty.

**Key Highlights**

- The supreme court highlighted that, **while rejecting or granting bail to accused persons, Judges should not slip into extensive deliberations on the merits of the case or evidence involved.**
- As such **long debates at the stage of bail may prejudice the case itself for the accused.**
- Also, that **once a case for bail is reserved for orders, the pronouncement of the decision should not take too long** as further waiting is a dent on the personal liberty of an undertrial.
- Therefore, the **Supreme Court has deprecated the practice of detailed elaboration of evidence in the orders granting/rejecting bail/anticipatory bail** and the practice of long delay between reserving the matter for order and pronouncing the order.

**About Bail**

- Bail is the **conditional release of a person held under legal custody in matters** which are yet to be pronounced by the Court, by undertaking a promise to appear in the Court as and when required.
- The **Code of Criminal Procedure, 1973 governs the terms of the bail.**

- **Section 2 (a) of the CrPC, 1973** defines the phrases “bailable offence” and “non-bailable offence” even though the Act does not define “bail” expressly.

#### Different categories of bail:

##### Bailable offences

- Section 2(a) of CrPC categorizes a bailable offence.
- It means that an offence that is **classified as bailable in the First Schedule** of the Code, or which is classified as bailable under any other law.
- An **accused can claim bail as a matter of right** if he is accused of committing a bailable offence.
- Under Section 436 of CrPC 1973, a person accused of a bailable offence at any time while under arrest without a warrant and at any stage of the proceedings has the right to be released on bail.

##### Non-bailable offences

- A non-bailable offence is defined as any offence which is not a bailable offence.
- A person accused of a non-bailable offence cannot claim bail as a right.
- A person **accused of non-bailable offences can be granted bail** provided the accused **does not qualify the following conditions**:
- There are reasonable grounds to believe that he has committed an offence punishable with death penalty or life imprisonment.
- That the accused has committed a cognizable offence and he had been previously convicted of an offence punishable with death, imprisonment for life or imprisonment of seven years or more or if the accused been convicted on two or more instances of a cognizable and non-bailable offence.

#### Types of bails in India:

- **Regular bail:**
- The court orders the release of a person who is under arrest, from police custody after paying the amount as bail money.
- An accused can apply for regular bail under Section 437 and 439 of CrPC.
- **Interim bail:**
- This is a direct order by the court to provide temporary and short term bail to the accused until his regular or anticipatory bail application is pending before the court.
- **Anticipatory bail:**
- This is a direct order of Sessions or High Court to provide pre-arrest bail to an accused of a crime.
- When the person has an apprehension of being arrested, the person can apply for anticipatory bail.

#### 23. Manoj Soni to take oath as UPSC chairman

**Subject: Polity**

**Section: National Body**

**Concept :**

- Educationist Manoj Soni will take oath as the chairman of Union Public Service Commission (UPSC). Soni, who joined the Commission as the member on June 28, 2017, has been performing the duties of the UPSC chairman since April 5, 2022.

#### About Union Public Service Commission

- The UPSC was established on 1 October 1926 by the Government of India **under the Government of India Act, 1919**.
- The Commission is headquartered in New Delhi and has regional offices in Allahabad, Bhopal, Chandigarh, Chennai, Guwahati, Hyderabad, Kolkata, Lucknow, Mumbai, and Patna.
- **It is an independent constitutional body.**
- The provisions regarding the composition of UPSC, appointment and removal of its members and the powers and functions of UPSC are **provided in Part XIV of the Indian Constitution under Article 315 to Article 323**.

#### Composition of Union Public Service Commission

- **Appointment of Members:** The Chairman and other members of the UPSC are **appointed by the President** of India.



- **Term of Office:** Any member of the UPSC shall hold office for a term of **six years or till the age of 65 years, whichever is earlier.**
- **Reappointment:** Any person who has once held the office as a member of a Public Service Commission is **ineligible for reappointment to that office.**
- **Resignation:** A member of the Union Public Service Commission may resign from his/her office by submitting the **written resignation to the President of India.**
- **Removal/Suspension of Members:** The Chairman or any other member of UPSC shall only be **removed from his/her office by order of the President of India.**
- The **President can remove the Chairman or any other member from his/her office( on grounds of Misbehaviour) in respect of whom a reference has been made to the Supreme Court.**
- **Advice of Supreme Court is binding.**
- **Conditions for Removal:** The Chairman or any other member of UPSC may be removed if he/she:
  - is adjudged an insolvent.
  - engages during his/her term of office in any paid employment outside the duties of his/her office.
  - is, in the opinion of the President, unfit to continue in office by reason of infirmity of mind or body.
- **Regulating the Conditions of Service:** In the case of the UPSC, the President of India shall:
  - Determine the number of members of the Commission and their conditions of service.
  - Make provisions with respect to the number of members of the staff of the Commission and their conditions of service.
- **Restriction of Power:** The conditions of service of a member of UPSC shall not be amended after his/her appointment that may lead to his/her disadvantage.
- **Power to Extend Functions:** The Legislature of a State may provide for the exercise of additional functions by the UPSC or the SPSC as respects the services of the Union or the State and also as respects the services of any local authority or other body corporate constituted by law or of any public institution.
- **Expenses of UPSC:** The expenses of the UPSC including salaries, allowances and pensions of the members or staff of the Commission are **charged on the Consolidated Fund of India.**
- **Submission of Reports:** The UPSC shall present an **annual report to the President** of India containing the work done by the Commission.
- The President shall provide a memorandum explaining the cases where the advice of the Commission was not accepted.
- The reasons for such non-acceptance are presented before each House of Parliament.

#### 24. SC upholds validity of Jallikattu

##### **Subject : Polity**

##### **Section: Constitution**

##### **Concept :**

- A five-judge Bench of the **Supreme Court upheld the amendments made by the legislatures of Tamil Nadu, Maharashtra, and Karnataka to The Prevention of Cruelty to Animals (PCA) Act, 1960.**
- The amendments **allowed bull-taming sports like jallikattu, kambala, and bullock-cart races**
- **Jallikattu**
- Jallikattu, also known as **eruthazhuvuthal**, is a **bull-taming sport** traditionally played in Tamil Nadu as **part of the Pongal harvest festival.**
- The **festival is a celebration of nature**, and thanksgiving for a bountiful harvest, of which cattle-worship is part.
- It is **popular in Madurai, Tiruchirappalli, Theni, Pudukkottai and Dindigul districts — known as the Jallikattu belt.**
- The practice of jallikattu has long been contested, with animal rights groups and the courts expressing concern over:
  - cruelty to animals and
  - the bloody and dangerous nature of the sport that sometimes causes death and injuries to both the bulls and human participants.

##### **Background of the case:**

- **2014 judgement of Supreme Court :**
- In 2014, a two-judge Bench of apex court had essentially outlawed two common sports practised in the States of Tamil Nadu and Maharashtra.
- These were referred to as Jallikattu and Bullock Cart Race

- The ruling also held that bovine sports were contrary to the provisions of Sections 3, 11(1)(a) and (m) of the Prevention of Cruelty to Animals Act, 1960.
- These sections relate to the duties of persons having charge of animals and define animal cruelty
- **Jallikattu protests in Tamil Nadu :**
- In 2015, the apex court also dismissed the Tamil Nadu government's plea calling for a recall of its verdict.
- Dismissing the government's plea, SC brushed aside the state government's argument that the 3,500-year-old tradition was rooted in religion.
- In January 2017, massive protests erupted across Tamil Nadu against the ban, with Chennai city witnessing a 15-day-long Jallikattu uprising.
- **2016 notification by the Ministry of Environment, Forest and Climate Change (MoEF&CC) allowing Jallikattu :**
- In January 2016, a notification was issued by the MoEF&CC prohibiting the exhibition or training of bulls as performing animals.
- However, an exception was carved in the notification.
- The exception specified that bulls might still be trained as performing animals at events such as Jallikattu in Tamil Nadu, according to the customs and culture of different communities.
- A batch of petitions were filed challenging the exemption notification, relying on the 2014 ruling.
- **Tamil Nadu Assembly passes bill in 2017 :**
- The Tamil Nadu Assembly, in 2017, passed a bill replacing an ordinance for conducting the bull-taming sport.
- The "Prevention of Cruelty to Animals (Tamil Nadu Amendment) Act 2017" was passed in this regard.
- The act said the "Government of Tamil Nadu has decided to exempt Jallikattu from the provisions of the Prevention of Cruelty to Animals Act".
- **Petitions challenging the bill :**
- The Animal Welfare Board of India (AWBI) and the Compassion Unlimited Plus Action (CUPA) filed some petitions.
- These petitions challenged the amendment to the Prevention of Cruelty to Animal Act passed by the Tamil Nadu Assembly.
- SC refused to stay the new Jallikattu law passed by the Assembly but slammed the state government for not following the law and order.
- **Matter transferred to larger bench :**
- In 2018, a two-judge bench referred the petitions challenging the Prevention of Cruelty to Animals (Tamil Nadu Amendment) Act, 2017 to a larger bench.
- The bench framed five questions to be adjudicated upon by the larger bench.
- While delivering its verdict for a batch of pleas challenging Tamil Nadu and Maharashtra laws allowing the traditional bull-taming sport Jallikattu, the Supreme Court upheld the validity of the laws.

## SC verdict on Jallikattu

### Tamil Nadu Amendment Act is not a piece of colourable legislation

- The top court held that the Tamil Nadu Amendment Act is not a piece of colourable legislation.
- **Doctrine of Colourable Legislation** means that if a legislature lacks the jurisdiction to enact laws on a specific subject directly, it cannot make laws on it indirectly. In simple words, the doctrine checks if a law has been enacted on a subject indirectly when it is barred to legislate on that topic directly.
- It relates to Entry 17 of List III of the Seventh Schedule to the Constitution which relates to the prevention of cruelty to animals.

### Observations regarding 2017 amendment

- The 2017 amendment "minimises cruelty to animals in the concerned sports".
- Once it is implemented and read with the rules, the sports will not come under the definition of cruelty defined in the 1960 Act.
- The amendment has received Presidential assent; hence, there is no flaw in the state action.
- **Jallikattu has historical context**
- As per the legislatures of Tamil Nadu, Jallikattu has been going on in Tamil Nadu for the last few centuries and forms a part of its cultural heritage.
- In this context, the court clarified that it did not want to disrupt the legislature's view.
- **2017 amendment does not violate Fundamental duties and Fundamental Rights**
- The court also said that the 2017 amendment does not violate Articles 51-A (g) and 51-A (h).
- **51-A (g) impose duties on Indian citizens to protect the environment.**

- 51-A (h) deals with developing a scientific temper, humanism, spirit of inquiry, and reform.
- It also held that the amendment didn't violate Articles 14 (Right to Equality) and 21 (Right to Life) of the Constitution.

## 25. Freedom of speech the 'bulwark' of democracy: Why the Andhra HC struck down order seeking to regulate public assemblies, processions

### **Subject : Polity**

#### **Section: Constitution**

**Context:** The Andhra Pradesh High Court has set aside a Government Order (GO) issued by the Andhra Pradesh government that sought to regulate public meetings, processions, and assemblies on roads, highways, and streets.

#### **What is the government order?**

- The Andhra Pradesh government sought to regulate public meetings or "assembly on roads, roadsides and margins".
- The state government relied on Sections 30, 30A, and 31 of the Police Act, 1861, to issue directions
- Section 30 relates to the regulation of public assemblies and processions and licensing of the same, Section 30-A allows the magistrate, superintendent, or "any other officer" to stop the procession and order dispersal of the assembly if there is a violation of the licence conditions.
- Section 31 relates to the police's duty to keep order on "public roads, public streets, thoroughfares, ghats, and landing places", and "other places of public resort", along with the prevention of obstruction during assemblies and processions on such roads, streets, or near places of worship.

#### **Why was it issued?**

- The government contended that certain fatal accidents that occurred in the past involving loss of life, etc., in a stampede.
- The government argued roads is made for smooth movement of vehicular traffic and for transportation" and therefore if there is a hindrance to the same by holding meetings, the state can definitely impose reasonable restrictions.

#### **What did the Andhra Pradesh HC hold?**

- The basis of the challenge in the present case titled 'Kaka Ramakrishna vs. The State of Andhra Pradesh'
- The court reasoned that the fact that an accident or incident occurred at a particular place cannot be used as an "objective" or "cause" to curtail the right to assemble, to take out processions, etc., on all other roads
- Stating that the "cure suggested in the G.O." will impose a restriction on the individual and his constitutional freedom, the court said that such a restriction on the right of a citizen or a political party to assemble and hold meetings is unreasonable
- The court held that the "right to assemble, to protest peacefully, and to express one's opinion freely" is too precious a freedom to be taken away by an "ipse dixit" (unproven assertion) given by the officer of the state
- Stating that freedom of speech is the "bulwark" of democracy and is regarded as the first in the hierarchy of liberties, the court reiterated that it is too precious a freedom to be left to anyone's unfettered discretion
- The power conferred by the G.O. is "arbitrary, excessive, and also fails on the test of proportionality," the court deemed the same to be an unreasonable restriction
- the objective of the state to prevent loss of life could have been a reasonable one but the directions given in the GO ultimately conferred "arbitrary power" on the officer in relation to a fundamental right under Part 3 of the Constitution
- The court held that "Any G.O. or executive order which takes away the right of a political party, a citizen, or a group of people to assemble peacefully, to protest peacefully, etc., has to be viewed strictly. This is a right, which is conferred on the citizens by the Constitution
- the court said that such a right can only be subject to a '**reasonable restriction**' citing SC's 2018 decision in '**Mazdoor Kisan Shakti Sangathan v Union of India and Another**', which laid down guidelines for peaceful assembly.

#### **Article 19 in the Constitution Of India**

- Protection of certain rights regarding freedom of speech etc
- All citizens shall have the right
  - to freedom of speech and expression;
  - to assemble peaceably and without arms;
  - to form associations or unions;

- to move freely throughout the territory of India;
- to reside and settle in any part of the territory of India; and
- to practise any profession, or to carry on any occupation, trade or business

subject to the reasonable restrictions on the exercise of the right.

## 26. Centre passes ordinance to nullify SC decision favoring Delhi govt

**Subject : polity**

**Section: Federalism**

**Concept :**

- The recent ordinance issued by the Centre on the control of services in Delhi has sparked controversy and raised questions about the constitutional status of the national capital.

**Details**

- The ordinance, which was promulgated on May 19, 2023, effectively nullifies the Supreme Court verdict that had given the power of transfer and posting of bureaucrats to the elected Delhi government.
- The ordinance designates the Lieutenant-Governor (L-G) as the administrator of Delhi, with the final say on the postings and transfer of all bureaucrats serving the Delhi government.

**Creates a new Statutory Body**

- **Composition**
- The ordinance creates a new statutory body called the **National Capital Civil Service Authority (NCCSA)**, which will consist of;
  - The Chief Minister
  - The Chief Secretary
  - The Principal Secretary (Home) of Delhi.
- **Function**
- The NCCSA will make **recommendations to the L-G regarding matters concerning transfer, posting, vigilance and other incidental matters of all Group A officials and officers of Delhi, Andaman and Nicobar Island Civil Service (DANICS) serving in the affairs of the Delhi government.**
- However, the **L-G can reject or return the recommendations of the NCCSA**, and in case of a dispute, **his decision will be final.**
- **Arguments by the Centre**
- The Centre has defended the ordinance as a necessary measure to ensure administrative balance and harmony in Delhi.
- They argued that the ordinance is in line with Article 239AA of the Constitution, which gives special status to Delhi as a Union Territory with a legislative assembly.
- They cited Article 239AB, which empowers the President to suspend or modify any provision relating to Delhi in case of a failure of constitutional machinery.
- **Criticism**
- The ordinance has been widely criticised by the Delhi Government, as an attempt to undermine its authority and autonomy.
- The State Government has accused the Centre of violating the constitutional principles of democracy and federalism and showing contempt for the Supreme Court's judgment.
- They also claimed that the ordinance will hamper the effective functioning and delivery of services by the Delhi government.

## 27. Supreme Court at full strength

**Subject : Polity**

**Section: Judiciary**

**Concept :**

- **Chief Justice of India Y. Chandrachud administered the oath of office to Justices Prashant Kumar Mishra and K.V. Viswanathan, bringing the Supreme Court of India back to its full strength of 34 judges.**
- The Supreme Court of India comprises **the Chief Justice and 33 other Judges appointed by the President of India.**
- Justices Mishra and Viswanathan replaced retiring Justices Dinesh Maheshwari and M.R. Shah.

- The swearing-in ceremony took place in the presence of the full court and members of the Bar, following their speedy appointments approved by the government.
- Justice Viswanathan, who could become the 58th Chief Justice of India in August 2030, is the ninth lawyer directly elevated to the Supreme Court Bench. Justice Mishra previously served as the Chief Justice of the Andhra Pradesh High Court.

### Constitutional Provisions

- Article 124(1) states that there shall be a Supreme Court of India consisting of a Chief Justice of India and, until Parliament by law prescribes a large number, of not more than seven other judges.
- Article 124(2) states that every judge of the Supreme Court shall be appointed by the President by warrant under his hand and seal after consultation with such number of the judges of Supreme Court and of the High Courts (in states).
- The Parliament is competent to increase the number of judges if it deems necessary.

### 28. No immunity for president as a contract party

**Subject : Polity**

**Section: Executive**

**Concept :**

- The Supreme Court of India held that **immunity cannot be claimed by the government from the application of law to a contract only because one of the parties to it is the President of India.**
- It was also ruled that the adjudicator should be “impartial and independent”.

**Other details of the Case:**

- The pistol maker Glock Asia-Pacific Limited filed a petition against the Union for the appointment of an arbitrator to a dispute regarding a tender.
- The agreement enabled the Home Secretary to appoint an officer in the Ministry of Law to be the sole arbitrator.
- The SC held that the agreement was a **clear violation of Section 12(5) of the Arbitration Act.**
- According to the provision, a person in a prior relationship with any party to the arbitration in terms of the employee, consultant, advisor, etc would be ineligible to become an arbitrator.
- The apex Court held that **Article 299 of the Constitution (contracts made by the Union or State in the name of the President or Governor) does not enable the government to break the statutory law.**

### Article 299 of Indian Constitution

- **All contracts made in the exercise of the executive power of the Union or of a State shall be expressed to be made by the President, or by the Governor of the State,** as the case may be, and all such contracts and all assurances of property made in the exercise of that power shall be executed on behalf of the President or the Governor by such persons and in such manner as he may direct or authorize.
- **Neither the President nor the Governor shall be personally liable in respect of any contract or assurance** made or executed for the purposes of this Constitution, or for the purposes of any enactment relating to the Government of India heretofore in force, nor shall any person making or executing any such contract or assurance on behalf of any of them be personally liable in respect thereof.

### 29. Post of Deputy CM

**Subject : Polity**

**Section: Executive**

**Concept :**

- K Shivakumar sworn in as Deputy Chief Minister of Karnataka

**Details:**

- Appointment of a Deputy CM has been a long-standing feature of Indian politics.
- The post of Deputy CM represents a political compromise that often follows the formation of a coalition government or when no single leader commands unchallenged authority in the party in power and loyalty across all key interest groups.

**Deputy Chief Minister**



- The post of **Deputy Chief Minister in India is not a constitutional one**, but a political arrangement to appease allies or factions within a party.
- The **Deputy CM is equivalent to a Cabinet Minister in terms of rank and perks but does not have any specific financial or administrative powers.**
- The **Deputy CM has to report to the Chief Minister** and seek his or her approval for any decision related to his or her portfolio.
- The **Deputy CM does not have access to the files or matters that are meant for the Chief Minister.**

### History of the post of Deputy CM

- The **first leader** to hold the **post of deputy CM** in independent India was the **Congress's Anugrah Narayan Sinha**.
- He was one of the tallest leaders to emerge from Bihar, termed the “mason of modern Bihar and its politics”.
- Later on, Karpooori thakur became deputy CM in 1967.
- Subsequently more states began to follow this pattern.
- As of 22 May 2023, 11 out of the 28 states have deputy chief ministers.
- In the northeastern states, where multi-party coalition governments are the norm, four of the seven states have Deputy CMs.

### Appointment and removal

- The **appointment and removal of a deputy chief minister is entirely at the discretion of the chief minister.**
- The **chief minister may appoint more than one deputy chief minister**, as is the case in some states like Uttar Pradesh.
- The chief minister may also reshuffle or drop a deputy chief minister at any time, as per their political calculations.

### Significance of the Post of Deputy Chief Minister

- The position of deputy chief minister is used to **bring political stability and strength to a coalition government.** It is also a way of rewarding loyal and influential leaders of the ruling party or alliance.
- The Deputy CM acts as the chief minister's deputy and assists them in the administration and governance of the state.
- In some cases, the Deputy CM may act as a bridge between the ruling party and its allies, or between different regions or communities within the state.
- The Deputy CM may be seen as a potential successor to the Chief Minister, or as a check and balance on his or her authority.
- The Deputy CM may have some influence on policy-making and governance, depending on his or her rapport with the Chief Minister and other ministers.
- The Deputy CM may also perform some of the functions of the chief minister in their absence, such as presiding over cabinet meetings, attending official functions, or representing the state in inter-state or national forums.
- However, the **deputy chief minister does not have any constitutional authority to act on behalf of the chief minister or to issue any orders or directives without their consent.**

### 30. Case against BBC Modi documentary in Delhi HC

**Subject : Polity**

**Section: Constitution**

**Concept :**

- The Delhi High Court Monday sought the BBC's stand on a suit moved by a public trust called Justice on Trial, which claimed that a documentary by the news organisation on Narendra Modi “casts a slur on the reputation of the country” and “makes false and defamatory imputations and insinuations against the Prime Minister of India”.

**Justice For All is a society registered under the Societies Registration Act.**

- Additionally, it is **registered as a public trust under the Bombay Public Trusts Act, 1950**. In this case, the plaintiff had filed a “suit for damages”, under Order 33 of the Code of Civil Procedure (CPC) “**seeking permission to file as an indigent person**”.

**Indigent Person**

- **Order 33 of CPC provides the procedure for institution of a suit by an indigent person.** The intent of the legislature to provide such rules was to enable the indigent (pauper) to file a suit without paying any court fees.
- **Indigent person:** is one who **is not possessed with sufficient means to pay the court fee in the suit** or if no court fee is prescribed for any suit, he is not entitled to property worth Rs. 1000.
- **Order 33 Rule 2** provides that indigent person can file a suit by making an application seeking permission of the court to apply as an indigent person. His application must include the following:
  - a) all the particulars what are mentioned in the Plaint
  - b) and all the movable or immovable properties of the indigent person with its estimate value
  - c) signature and verification as provided under Rule 14, 15 of Order 6.
- The application must be presented in person unless the court has exempted it.

#### **Rejection of application- Order 33 Rule 5**

- It provides that the court will prima facie reject an application seeking permission of the court to apply as an indigent person in the following circumstances:
  - a) If the application was not presented in the manner prescribed under Rule 2 and 3 of Order 33.
  - b) If applicant is found not to be an indigent person.
  - c) If the applicant fraudulently disposed of his property within two months before presentation of the application.
  - d) If there is no cause of action.
  - e) If applicant has entered into an agreement with any third party and in respect to subject matter of the suit wherein other party obtains interest.
  - f) If the suit is barred by law.

### **31. CJI Chandrachud condemns 'forum shopping': What is this practice?**

**Subject: Polity**

**Section: Judiciary**

**Context:**

I will not permit forum shopping", said Chief Justice of India (CJI) DY Chandrachud last week to a litigant appearing before him

#### **What is practice of forum shopping?**

- **When litigants or lawyers attempt to deliberately move their case to a particular judge or Court where they think the judgment could be more favourable, they are said to be "forum shopping."**
- For example, **one could directly approach the Supreme Court via a public interest litigation case instead of the concerned High Court because the issue could get more eyeballs.**
- Similarly, "Bench hunting" refers to petitioners managing to get their cases heard by a particular judge or court to ensure a favourable order, the court added
- most common law countries use the "forum non-conveniens" principle to prevent forum shopping, which gives the court discretionary powers to refuse to exercise its jurisdiction over a matter where another court, or forum, may more conveniently hear a case.
- Using this power, the court can dismiss a case in the interests of justice and the parties while allocating it to the appropriate bench

#### **What's Supreme Court ruling regarding this?**

- The Supreme Court in its **1988 ruling in 'Chetak Construction Ltd. vs. Om Prakash'** said, "A litigant cannot be permitted choice of the forum," and that every attempt at forum shopping "must be crushed with a heavy hand"
- Last year, on March 22, **an SC Bench of Justice S. Abdul Nazeer and Justice Krishna Murari in the case of 'Vijay Kumar Ghai vs. State of W.B.'** termed forum shopping as a "disreputable practise by the courts" that "has no sanction and paramountcy in law".

- In the **2022 ruling**, the court reiterated that forum shopping has been condemned by courts while referring to its 2017 ruling in ‘**Union of India & Ors. vs. Cipla Ltd.**’, which laid down a “functional test” to be adopted for forum shopping.
- What has to be seen is whether there is any functional similarity in the proceedings between one court and another or whether there is some sort of subterfuge on the part of a litigant.
- It is this functional test that will determine whether a litigant is indulging in forum shopping or not

### 32. Parliament buildings and Constitutional provisions

**Subject : Polity**

**Section: Parliament**

**Concept :**

- The BJP and the Congress have locked horns over the upcoming inauguration of the new Parliament building by Prime Minister Narendra Modi, with Union Minister Hardeep Singh Puri alleging that the Congress is “generously misquoting” from the Constitution and “lacks in any national spirit & sense of pride in India’s progress”.
- Tharoor agreed with Kharge and mentioned **Articles 60 and Article 111 of the Constitution**, which he said “**make it clear that the President is the head of the parliament**”.

#### **Article 60 of Indian Constitution – Oath or affirmation**

- Article 60 of the Indian Constitution prescribes the Oath or affirmation by the President.
- It states that the oath of office to the President is administered by the Chief Justice of India and, in his absence, the senior-most judge of the Supreme Court available.
- Any other person acting as President or discharging the functions of the President also undertakes the similar oath or affirmation.

#### **Article 111 of Indian Constitution – Assent to Bills**

- Article 111 of the Indian Constitution says that whenever a Bill is passed from both the Houses of Parliament, it shall then be presented to the President of India for final approval.
- Now, it is in the hands of the President if he assents to the Bill or holds it back for reconsideration. If he thinks that the Bill is not the Money Bill that he can immediately after receiving the Bill transmit it back to the Lok Sabha with a message as a request to reconsider the Bill.
- The President can also specify a particular provision he is not sure of as a recommendation in his message. After the Bill is returned back in Lok Sabha, then the House of People will reconsider the Bill accordingly.
- Now, it will depend on the House Of People to consider the amendments recommended by the President. If the House feels that the amendment is pivotal and necessary then it may or may not make those amendments.
- After the reconsideration when the Bill is again sent to the President for final assent, this time it has to be assented to by the President of India for further proceeding in Financial Matters.

### 33. CAG team works to increase synergy among ministries

**Subject : Polity**

**Section: constitutional body**

**Concept :**

- A team of CAG held a brainstorming session with senior officers of central ministries with a view to facilitating the identification of systemic issues and potential areas for improvement.
- The CAG team was headed by Deputy Comptroller and Auditor General (Report Central) Rakesh Mohan.

#### **Comptroller and Auditor General of India (CAG)**

- The **Constitution of India provides for an independent office of the Comptroller and Auditor General of India (CAG)**.
- He is the **head of the Indian Audit and Accounts Department** and is one of the bulwarks of the democratic system of government in India
- He is the guardian of the public purse and controls the entire financial system of the country at both the levels—the Centre and the state.
- His duty is to uphold the Constitution of India and laws of Parliament in the field of financial administration.

#### **Constitutional Provisions for Office of CAG**

- **Article 148** broadly deals with the CAG appointment, oath and conditions of service.
- **Article 149** deals with Duties and Powers of the Comptroller and Auditor-General of India.
- **Article 150** says that the accounts of the Union and of the States shall be kept in such form as the President may, on the advice of the CAG, prescribe.
- **Article 151** says that the reports of the Comptroller and Auditor-General of India relating to the accounts of the Union shall be submitted to the president, who shall cause them to be laid before each House of Parliament.
- **Article 279** Calculation of “net proceeds” is ascertained and certified by the Comptroller and Auditor-General of India, whose certificate is final

### Appointment, Term & Removal

- The CAG is **appointed by the President of India by a warrant under his hand and seal.**
- The CAG holds office for a **period of six years or up to the age of 65 years, whichever is earlier.**
- He can resign any time from his office by addressing the resignation letter to the president.
- He can also be **removed by the president on same grounds and in the same manner as a judge of the Supreme Court.** In other words, he can be removed by the president on the basis of a resolution passed to that effect by both the Houses of Parliament with special majority, either on the ground of proved misbehaviour or incapacity.
- **Independence**
- The Constitution has made the following provisions to safeguard and ensure the independence of CAG:
- He is **provided with the security of tenure** and can be removed by the president only in accordance with the procedure mentioned in the Constitution. **Thus, he does not**
- hold his office till the pleasure of the president, though he is appointed by him.
- He is **not eligible for further office**, either under the Government of India or of any state, after he ceases to hold his office.
- His salary and other service conditions are determined by the Parliament. His salary is equal to that of a judge of the Supreme Court.
- Neither his salary nor his rights in respect of leave of absence, pension or age of retirement can be altered to his disadvantage after his appointment.
- The **administrative expenses of the office of the CAG**, including all salaries, allowances and pensions of persons serving in that office are charged upon the Consolidated Fund of India and **are not subject to the vote of Parliament.**
- **No minister can represent the CAG in Parliament** (both Houses) and no minister can be called upon to take any responsibility for any actions done by him.

### Duties of CAG

- CAG audits the **accounts related to all expenditure from the Consolidated Fund of India, Consolidated Fund of each state and UT** having a legislative assembly.
- CAG audits **all expenditure from the Contingency Fund of India and the Public Account of India as well as the Contingency Fund and Public Account of each state.**
- CAG audits all trading, manufacturing, profit and loss accounts, balance sheets and other subsidiary accounts kept by any department of the Central Government and the state governments.
- CAG audits the receipts and expenditure of all bodies and authorities substantially financed from the Central or State revenues; government companies; other corporations and bodies, when so required by related laws.
- He ascertains and certifies the net proceeds of any tax or duty and his certificate is final on the matter.

### 34. Independence of judiciary is part of basic structure of Constitution: SC

#### Subject : Polity

#### Section: Constitution

#### Concept :

- The Supreme Court has held that the **independence of district judiciary is part of the basic structure of the Constitution** and judicial independence from the executive and the legislature requires the judiciary to have a say in matters of finances.

#### Basic Structure Doctrine:

- A **13-judge Bench** was set up by the Supreme Court, the biggest so far, and the case was heard over 68 working days spread over six months.

- The case was **primarily about the extent of Parliament's power to amend the Constitution.**
- First, the court was **reviewing a 1967 decision in Golaknath v State of Punjab** which, had ruled that Parliament cannot amend fundamental rights.
- Second, the court was **deciding the constitutional validity of several other amendments.**
- The **executive vs judiciary manoeuvres displayed in the amendments ended with the KesavanandaBharati case**, in which the court had to settle these issues conclusively.
- In its majority ruling, the court held that fundamental rights cannot be taken away by amending them. While the court said that **Parliament had vast powers to amend the Constitution, it drew the line by observing that certain parts are so inherent and intrinsic to the Constitution that even Parliament cannot touch it.**
- The **origins of the basic structure doctrine are found in the German Constitution** which, after the Nazi regime, was amended to protect some basic laws. The original Weimar Constitution, which gave Parliament to amend the Constitution with a two-thirds majority, was in fact used by Hitler to his advantage to make radical changes. Learning from that experience, the new German Constitution introduced substantive limits on Parliament's powers to amend certain parts of the Constitution which it considered 'basic law'.
- In India, the **basic structure doctrine has formed the bedrock of judicial review of all laws passed by Parliament.**
- The present position is that the **Parliament under Article 368 can amend any part of the Constitution including the Fundamental Rights but without affecting the basic structure** of the Constitution.
- However, the **Supreme Court is yet to define or clarify as to what constitutes the basic structure of the Constitution.** From the various judgments, the following have emerged as basic features of the Constitution or elements / components / ingredients of the 'basic structure' of the constitution:
  - Supremacy of the Constitution
  - Sovereign, democratic and republican nature of the Indian polity
  - Secular character of the Constitution
  - Separation of powers between the legislature, the executive and the judiciary
  - Federal character of the Constitution
  - Unity and integrity of the nation
  - Welfare state (socio-economic justice)
  - Judicial review
  - Freedom and dignity of the individual
  - Parliamentary system
  - Rule of law
  - Harmony and balance between Fundamental Rights and Directive Principles
  - Principle of equality
  - Free and fair elections
  - Independence of Judiciary
  - Limited power of Parliament to amend the Constitution
  - Effective access to justice
  - Principle of reasonableness
  - Powers of the Supreme Court under Articles 32, 136, 141 and 142

### 35. Old Parliament building saw the Supreme Court's earliest sittings

**Subject: Polity**

**Section: Judiciary**

**Concept:**

- After its inauguration on January 28, 1950, the Supreme Court commenced its sittings in a part of the Parliament House. The Court moved into the present building on Tilak Marg in 1958. We take a look at its history.
- The Chamber of Princes in the parliament building was where the Federal Court of India had sat for 12 years, between 1937 and 1950. The Supreme Court too began its sittings in the Parliament.

#### **Chamber of Princes**

- The Chamber of Princes (Narendra Mandal) was an institution established in 1920 by a royal proclamation of King-Emperor George V to provide a forum in which the rulers of the princely states of India could voice their needs and aspirations to the colonial government of British India. It survived until the end of the British Raj in 1947.
- The Chamber had an advisory and consultative role. It was represented by 120 princes out of 565 in all.



- In all its years of existence, only the rulers of Bikaner, Patiala, Nawanagar and Bhopal were chosen as chancellors of the Chamber of Princes.
- The Chamber of Princes usually met only once a year, with the Viceroy of India presiding, but it appointed a Standing Committee which met more often.
- The full Chamber elected from its princely ranks a permanent officer styled the Chancellor, who chaired the Standing Committee.
- The chamber convened at the Parliament House. Today the hall is used as the parliament's library.

### 36. Model Prisons Act 2023

**Subject: Polity**

**Section: Judiciary**

**Context:** The Ministry of Home Affairs (MHA) has prepared a Model Prisons Act, 2023, to replace the existing 130-year-old colonial law governing prisons. The Act is being introduced following the spate of killings and gang violence within prisons, such as the recent murder of TilluTajpuriya inside Tihar jail.

**Concept:**

- Along with the Prisons Act, 1894, the Prisoners Act, 1900, and the Transfer of Prisoners Act, 1950 have also been reviewed by the MHA, and their relevant provisions have been assimilated into the Model Prisons Act, 2023.
- According to the provisions of the Constitution, **'prisons' and 'persons detained therein' fall under the State List**. This means that the responsibility of prison management and administration is with the **state government**, which **alone is competent to make appropriate legislative provisions** in this regard.

**How the new act differs from the existing laws?**

New Provisions	Earlier laws
<ul style="list-style-type: none"> <li>• The new Act seeks to create provisions for the <b>grant of parole, furlough, and remission</b> to prisoners to encourage good conduct.</li> <li>• It aims to provide <b>separate accommodation to women and transgender inmates</b>, ensure the physical and mental wellbeing of prisoners, and <b>focus on their formation and rehabilitation of inmates</b>.</li> <li>• It seeks to bring about <b>"transparency in prison management"</b>, and includes provisions for <b>security assessment and segregation of prisoners; individual sentence planning; grievance redressal; a prison development board; use of technology</b> in prison administration; and protecting society from "criminal activities of hardened criminals and habitual offenders". Provisions for establishing <b>high-security jails and open, semi-open jails</b> have also been inserted.</li> <li>• New measures for <b>prisoners to video conference with courts</b> have also been introduced. However, if a <b>prisoner is using prohibited items like mobile phones in jail, they will be punished</b>.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Prisons Act of 1894</b> defined a <b>"prison"</b> as "any jail or place used <b>permanently or temporarily under the general or special orders of a State Government</b> for the detention of prisoners", excluding police custody and subsidiary jails.</li> <li>• The Act had <b>no provisions for reformation or rehabilitation</b> and permitted "whipping, provided that the number of stripes shall not exceed thirty", albeit for only male prisoners.</li> <li>• The <b>Prisoners Act 1900</b> was introduced with the objective of <b>consolidating the "several acts relating to prisoners"</b> and <b>dealt with the prisoners within presidency towns and those outside</b>; it also included provisions on <b>how to deal with lunatic prisoners</b> and <b>allowed prisoners to be removed from prisons upon conditions like receiving death sentences and maintaining good behaviour within prisons</b>.</li> </ul>

### Is the new law binding on states?

- Owing to the critical role played by “efficient prison management” in the criminal justice system, the Centre finds it crucial to support the States and UTs in this regard. So, the ministry clarified that the 2023 Act “may serve as a guiding document for the states” so that they may benefit from its adoption in their jurisdictions.

### Schemes

#### 1. Karnataka ranked the most ‘innovative’ State in manufacturing

##### **Subject : Schemes**

##### **Concept :**

- The **National Manufacturing Innovation Survey (NMIS) 2021-22** has ranked **Karnataka as the most “innovative” State.**
- **About National Manufacturing Innovation Survey (NMIS):**
- It is a joint study by the **Department of Science and Technology (DST) and the United Nations Industrial Development Organization (UNIDO)**
- **Aim of the survey:** To evaluate the innovation performance of manufacturing firms in India.
- It had **two specific components:**
- **Firm-level survey:** It captured data related to types of innovations and innovative measures taken by firms, including the process of innovation, access to finance, resources, and information for innovation etc.
- **Sectorial System of Innovation (SSI) survey:** It mapped the manufacturing innovation system and its enabling role in achieving innovations in firms.
- The SSI study measured the convergence or divergence of current policy instruments in select five key manufacturing sectors important to the Indian economy – textiles; food & beverage; automotive; pharma; and ICT.
- The **first National Innovation Survey was held in 2011.**

##### **Key Highlights of the Survey**

- Karnataka was followed by **Dadra and Nagar Haveli, Daman and Diu, Telangana, and Tamil Nadu.**
- The survey evaluated the innovation performance of manufacturing firms and the degree of innovation among manufacturing firms in India.
- As per the survey, Telangana (46.18%), Karnataka (39.1%), and Tamil Nadu (31.9%) had the highest share of innovative firms, whereas Odisha (12.78%), Bihar (13.47%) and Jharkhand (13.71%) reported the lowest share of such firm.
- The survey also notes that the most frequent “barriers to innovation” were the lack of internal funds, high innovation costs, and lack of financing from external sources.
- Gujarat and Dadra and Nagar Haveli, Daman and Diu reported the highest frequencies of barriers to innovation.

##### **United Nations Industrial Development Organization**

- It is a **specialized agency of the United Nations** with a unique mandate to **promote dynamize and accelerate industrial development.**
- It provides support to **its 171 Member States through four mandated functions:**
- Technical cooperation
- Action-oriented research and policy-advisory services.
- Normative standards-related activities
- Fostering partnerships for knowledge and technology transfer.
- **India is a member of this organization.**

#### 2. Tele Manas counsels Kashmir’s distressed souls

##### **Subject :Schemes**

##### **Concept :**

- Over the past six months, the Institute of Mental Health and Neurosciences (IMHANS) in Srinagar has received 10,500 calls from people in distress across Jammu and Kashmir’s toll-free numbers 14416 and 1800-891-4416.

## About

- The Tele-MANAS cell at IMHANS was launched on November 4 with the support of the National Health Mission, Jammu and Kashmir.
- It aims to provide mental health support, early screening, first-aid, distress management, mental well-being, suicide prevention, and psychological crisis management in Jammu and Kashmir.
- The centre operates through a toll free-number—11416/1-800-891-4416. The crisis counsellors or the first-time responders are the first points of contact for callers at the 24\*7 helpline

## Tele-MANAS

- It was launched on World Mental Health Day (10 October).
- The Tele Mental Health Assistance and Networking Across States (Tele-MANAS) initiative is a comprehensive mental health care service.
- Tele-MANAS aims to provide free tele-mental health services all over the country round the clock, particularly catering to people in remote or under-served areas.
- The Tele-MANAS programme consists of a network of 23 tele-mental health centres of excellence, with NIMHANS as the nodal centre.
- Indian Institute of Technology (IIT) Bengaluru and the National Health Systems Resource Centre (NHRSC) have been roped in for technical support.

## 3. India to release manual for organ donation

### Subject :Schemes

#### Concept :

- From standardising the course for transplant coordinators to developing a manual for setting up an organ transplant programme at a hospital, the **National Organ and Tissue Transplant Organisation (NOTTO)** is working towards structural reforms to improve organ donation and transplant in the country.
- The organisation has been working towards standardising processes for registering to receive organs and the allocation of organs across the country, with a call for a “one nation, one policy”.
- The government recently granted special casual leave of up to 42 days to central government employees who donate organs.

#### About NOTTO

- **National Organ and Tissue Transplant Organisation (NOTTO)** is set up under **Directorate General of Health Services**, Ministry of Health and Family Welfare, located in New Delhi.
- **Organ donation in India is regulated by the Transplantation of Human Organs and Tissues Act, 1994.**

#### About National Organ Transplant Programme (NOTP):

- **National Organ Transplant Programme (NOTP)** aims to promote organ donation and transplantation across all States/Union Territories (UTs).
- **Implementing Agency:** Directorate General of Health Services(DGHS), Ministry of Health and Family Welfare is implementing the National Organ Transplant Programme.

#### Objectives of the Programme:

- To organize a system of organ and tissue procurement & distribution for transplantation.
- To promote deceased organ and Tissue donation.
- Furthermore, to train required manpower.
- Also, to protect vulnerable poor from organ trafficking.
- Lastly, to monitor organ and tissue transplant services and bring about policy and programme corrections/changes whenever needed.

#### Key Features of the Programme:

- The key activities under the programme include:
- Setting up of State Organ and Tissue Transplant Organisations (SOTTOs) in each State/UT.
- Setting up of National/ Regional/State Bio-material centres.
- Financial support for establishing new Organ Transplant/retrieval facilities and strengthening of existing Organ Transplant/retrieval facilities.
- Training to transplant experts including surgeons, physicians, transplant coordinators, etc.
- Financial support for the hiring of Transplant Coordinators to medical colleges and trauma centres.

- Post-transplant immune-suppressant drugs to Below Poverty Line (BPL) patients.

#### **Nodal Centre:**

- **National Organ and Tissue Transplant Organisation (NOTTO) has been set up as the apex center for all Indian activities of coordination and networking** for procurement and distribution of organs and tissues and registry of Organs and Tissues Donation and Transplantation in the country.

#### **4. National Programme for Prevention and Control Of Non-Communicable Diseases**

##### **Subject :Schemes**

#### **Concept :**

- The Union government has decided to expand and rebrand its programme for tackling non-communicable diseases (NCDs) in response to the emergence of many new diseases or disease groups and new health initiatives.

#### **Details**

- The programme, which was previously known as the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS), now covers 12 NCDs and 10 health initiatives, including mental health, oral health, palliative care, geriatric care, trauma care, and emergency medical services.
- The new name of the programme is Comprehensive Primary Health Care through Health and Wellness Centres (CPHC-HWC).

#### **National Programme for Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS)**

- It is a **flagship initiative of the Government of India** to address the rising **burden of non-communicable diseases (NCDs)** in the country.
- NCDs are estimated to account for around 60% of all deaths in India and cause considerable loss in potentially productive years of life.
- It was **launched in 2010** to strengthen infrastructure, human resource development, health promotion, early diagnosis, management and referral of common NCDs such as cancer, diabetes, cardiovascular diseases and stroke.
- The **programme covers both urban and rural areas** and provides free diagnostic facilities and drugs for patients attending the NCD clinics at district and community health centres.

#### **National Programme for Prevention & Control of Non-Communicable Diseases (NP-NCD)**

- NPCDCS was launched in 2010, and will now be called the **National Programme for Prevention & Control of Non-Communicable Diseases (NP-NCD)**.
- The new name reflects the **shift in focus from only controlling the four major non-communicable diseases (NCDs) to preventing them as well**.
- According to the MoHFW, the NP-NCD will aim to reduce the burden of NCDs by promoting healthy lifestyles, early detection and timely treatment.
- The programme will also integrate with other health initiatives such as Ayushman Bharat and National Health Mission.
- The programme will also strengthen the health system by enhancing human resources, infrastructure, equipment and drugs.
- The NP-NCD will also leverage digital technologies such as telemedicine and m-health to improve access and quality of NCD care.

#### **5. Initiatives Taken By Government To Tackle Mental Health Related Issues**

##### **Subject : Schemes**

#### **Context:**

As per the National Mental Health Survey conducted by the National Institute of Mental Health and Neurosciences (NIMHANS), Bangalore in 12 States of the country, the prevalence of mental disorders including common mental disorders, severe mental disorders, and alcohol and substance use disorders (excluding tobacco use disorder) in adults over the age of 18 years is about 10.6%.

#### **The major findings of the survey are as under:**

- The prevalence of mental morbidity is high in urban metropolitan areas.

- Mental disorders are closely linked to both causation and consequences of several non-communicable disorders (NCD).
- **Nearly 1 in 40 and 1 in 20 persons suffer from past and current depression**, respectively.
- Neurosis and stress related disorders affect 3.5% of the population and was reported to be higher among females (nearly twice as much in males).
- **Data indicate that 0.9 % of the survey population were at high risk of suicide.**
- **Nearly 50% of persons with major depressive disorders** reported difficulties in carrying out their daily activities.
- **Initiative taken to tackle mental health:**
- National Mental Health Programme (NMHP) in 1982:
- **NMHP has 3 components:**
- Treatment of Mentally ill
- Rehabilitation
- Prevention and promotion of positive mental health.
- **Aims:**
- Prevention and treatment of mental and neurological disorders and their associated disabilities.
- Use of mental health technology to improve general health services.
- Application of mental health principles in total national development to improve quality of life.
- To address the burden of mental disorders, the Government of India is supporting implementation of the **District Mental Health Programme (DMHP) under the National Mental Health Programme in 704 districts** of the country for detection, management and treatment of mental disorders/ illness
- Under the aegis of the **School Health Programme under Ayushman Bharat**, NCERT has developed a **specific module on “Emotional Wellbeing and Mental Health”**, which has activities related to the mental health and well-being of students and teachers.
- The **Ministry of Education** has taken up a proactive initiative, named, ‘**Manodarpan**’, covering a wide range of activities to provide psychosocial support to students, teachers and families for Mental Health and Emotional Wellbeing during the COVID outbreak and beyond
- The **Mental Health Care Act 2017** was passed on 7 April 2017 and came into force from 29 May 2018.
- It aims at **decriminalizing the Attempt to Commit Suicide** by seeking to ensure that the individuals who have attempted suicide are offered opportunities for rehabilitation from the government as opposed to being tried or punished for the attempt.
- The **Act seeks to fulfill India’s international obligation pursuant to the Convention on Rights of Persons with Disabilities** and its Optional Protocol.
- The 2017 **Act recognizes the agency of people with mental illness**, allowing them to make decisions regarding their health, given that they have the appropriate knowledge to do so.
- The Act **aims to safeguard the rights of the people with mental illness**, along with access to healthcare and treatment without discrimination from the government.
- Additionally, **insurers are now bound to make provisions for medical insurance for the treatment of mental illness** on the same basis as is available for the treatment of physical ailments.
- The Mental Health Care Act 2017 includes provisions for the registration of mental health related institutions and for the regulation of the sector.
- The Government constituted the **Central Mental Health Authority under the Mental Healthcare Act, 2017 on 04/12/2018**
- Government of India has launched the **National Tele Mental Health Programme (Tele MANAS)** on 10th October 2022 to provide access to mental health care services to all through a centralized toll-free helpline
- **IIT-M launched the ‘Kushal Programme’** which aims to foster closer associations between individual students and faculty members, creating a support network for students who may be struggling academically or emotionally.
- The institute has also launched a ‘**Be Happy**’ website (<https://behappy.iitm.ac.in/>) to provide resources and guidance to support mental health and overall well-being.

## 6. Territorial Army

### **Subject :Schemes**

#### **Concept :**

- Defence Minister Rajnath Singh has approved the posting of women officers with Engineer Regiments of the Territorial Army (TA) along the Line of Control (LoC).



## **Territorial Army:**

- It aims to commemorate its raising by the first Governor General C Rajagopalachari on this day in 1949.
- The **Territorial Army (TA) was raised by the Britishers in 1920 through Indian Territorial Act of 1920** and it was org into two wings namely – ‘The **Auxiliary Force**’ for Europeans & Anglo-Indians and ‘The **Indian Territorial Force**’ for Indian Volunteers.
- After Independence **Territorial Army Act was passed in 1948** and the Territorial Army was formally inaugurated by the first Indian Governor General Shri C Rajagopalachari on 09 Oct 1949.
- **Role:**
- The **Territorial Army is part of Regular Army** and its **present role is to relieve the Regular Army from static duties and assist civil administration in dealing with natural calamities and maintenance of essential services in situations** where life of the communities is affected or the Security of the Country is threatened and to provide units for Regulars Army as and when required.
- **Eligibility:**
- Any citizen **between the age of 18-42 can be a part of the service.**
- The pensionable age for a soldier below officer’s rank in the TA is the same as that of a regular soldier — 15 years.
- **Operations:**
- The TA units were **also actively involved in operations during the 1962, 1965 and 1971 wars.**
- Since 2020, the Indian military has been recalibrating the TA for better operational and intelligence roles, especially in the Andaman Islands to keep an eye out for possible Chinese intrusions in the region.
- **Motto:** The motto of the Territorial Army of India is ‘SavdhaniVaShoorta’ (Vigilance and Valour).

## **7. Operation Samudragupt**

### **Subject :Schemes**

#### **Concept :**

- The **Narcotics Control Bureau (NCB) and the Indian Navy**, in a joint operation off the Kerala coast, have **seized approximately 2,500 kg of methamphetamine** valued at **about 15,000 crore and originating from Pakistan.**
- This is the largest drug seizure in terms of financial value by any anti-drug enforcement agency in the nation.
- The **seizure is a part of Operation Samudragupt**, which seeks to rid the Indian Ocean region of drugs by targeting drug trafficking on ships.

#### **Operation Samudragupt**

- The Director General of NCB started Operation Samudragupt to stop the trafficking of heroin and other drugs in the Indian Ocean region.
- Officers from the Operations Branch of NCB Headquarters participated in the operation, which was led by Sanjay Kumar Singh, Deputy Director General (Ops), NCB.
- The **operation’s main goal was to gather actionable intelligence that could result in the interdiction of ships transporting illegal drugs.**
- The team exchanged information with narcotics law enforcement organisations including DRI and ATS Gujarat as well as intelligence organisations like the Indian Navy’s Intelligence Wing and NTRO.

#### **Methamphetamine- the stimulant drug**

- **Methamphetamine — meth for short — is a powerful, highly addictive stimulant that affects the central nervous system, and is used to treat attention-deficit hyperactivity disorder (ADHD) and narcolepsy, a sleep disorder.**
- Crystal methamphetamine or crystal meth is a form of the drug that looks like glass fragments or shiny, bluish-white rocks.
- It is **chemically similar to amphetamine.**
- Methamphetamine can be **smoked, swallowed in the form of a pill or tablet, snorted, and injected** after dissolving the powder in water or alcohol.
- **Methamphetamine can lead to myocardial infarction (heart attack); it can cause stroke.**
- The **drug can affect the heart, the brain, and the kidneys.** It can result in the blood pressure shooting up suddenly. So, it is a very dangerous drug if there is an overdose.

## **8. Centre writes to States to curb trend of unnecessary hysterectomies**

### **Subject :Schemes**

### Concept :

- Worried that poor, less-educated women, particularly in the rural areas, continue to be at higher risk of undergoing unnecessary and often unjustified hysterectomies, the **Health Ministry has written to all stakeholders to work towards plugging “such hysterectomies performed by certain medical institutions”**.
- The **Centre has asked states to provide data on hysterectomies conducted in private as well as public hospitals** with an aim to prevent certain medical institutions from carrying out the procedure even when it is unnecessary and unjustified.

### Hysterectomy

- Hysterectomy is a **surgical procedure to remove the uterus**, and sometimes surrounding organs and tissues.
- It can be classified as a partial hysterectomy (removal of the uterus), total hysterectomy (removal of the uterus and cervix), or radical hysterectomy (removal of the uterus, cervix, part of the vagina, and surrounding tissues).
- The procedure can be performed through the vagina or through an incision in the abdomen.
- **Issues with such surgery**
- **Overuse and unnecessary procedures:** Hysterectomy can be performed without exploring alternative treatments.
- **Psychological and emotional impact:** The procedure may lead to feelings of loss and changes in body image.
- **Surgical risks and complications:** Hysterectomy carries risks such as infection and damage to surrounding organs.
- **Long-term health effects:** Removal of the uterus may have impacts on hormones and bone health.
- **Patient autonomy and informed consent:** Patients should be fully informed about the procedure and involved in decision-making.
- **Access and equity:** Disparities in access to healthcare may contribute to overuse, particularly among marginalized communities.

### Concerns and Petition

- A public interest litigation (PIL) highlighted the occurrence of unnecessary hysterectomies in the states of Bihar, Chhattisgarh, and Rajasthan under government healthcare schemes.

### Government action and guidelines

- The Health Ministry has closely monitored the issue of hysterectomies and requested States to share data on hysterectomy cases before and after the implementation of guidelines.
- Compulsory audits for all hysterectomies are advised, similar to those conducted for maternal mortality, in both public and private healthcare institutions.
- In 2022, the Health Ministry issued guidelines to prevent unnecessary hysterectomies and urged States to comply with them.

## 9. Land record digitisation

### **Subject: Schemes**

#### **Digital India Land Records Modernization Programme (DILRMP)**

- Keeping this in view, the government revamped the existing National Land Record Modernization Programme (NLRMP) by bringing into force, the Digital India Land Records Modernization Programme (DILRMP) w.e.f April 1, 2016, as a Central scheme with 100 per cent funding.
- **Two Centrally sponsored schemes of Computerization of Land Records (CLR) and Strengthening of Revenue Administration and updating of Land Records (SRA&ULR)** were merged.
- The programme is slated to be fully implemented by March 2026, with completion of basic digitisation of Record of Rights (RoRs) and Cadastral Maps and integration of the two, computerisation of Sub Registrar Offices (SROs), and integration of SROs and Revenue Offices by March 2024.
- The DILRMP scheme was launched with a view to attain commonalities that exist in the arena of land records in various States, develop an integrated system which will, among other things, provide real-time information on land, optimise use of land resources, assist in policy and planning, reduce land disputes, check fraudulent/ *benami* transactions, obviate the need for physical visits to Revenue/Registration offices and enable sharing of information with various organisations/agencies.

- It attempts to build upon the commonalities that exist in the arena of land records in various States to develop an appropriate Integrated Land Information Management System (ILIMS) across the country, on which different States can also add State-specific needs as they may deem relevant and appropriate.

### **Identification number**

**Firstly**, a Unique Land Parcel Identification Number (ULPIN) or Bhu-Aadhaar number has been assigned for a land parcel, which is a 14 digit alphanumeric unique ID based on geo-coordinates. It will serve as a pan-India number for obtaining ownership details of a plot along with its size and geolocation. This will result in standardisation of land records data across the country which will serve multiple purposes, including seamless sharing and cross-validation of land data across sectors/agencies/authorities and preventing duplication of land records.

**Secondly**, a uniform system called National Generic Document Registration System (NGDRS) has been developed for addressing the diversity prevailing across States with regards to registration of deeds/documents. The major benefits of this system include citizen empowerment through online entry of deed, online payment, online pre-appointment, document search and certified copy generation, decrease in time and cost at Sub-Registrar level, accommodation of all variations/gaps prevailing across the States, SMS and email alerts related to transactions on property as well as rule based transparent online valuation with accurate calculation of property cost.

**Thirdly**, the Records of Rights have been transliterated in all the 22 scheduled languages mentioned in the Constitution to address the problem of linguistic barriers in land governance in the country. This will enable the government to make informed policy decisions for the benefit of its citizens and will also benefit citizens and stakeholders, especially potential start-ups, investors and industry.

The DILRMP scheme will also facilitate various services such as providing caste, income and domicile certificates, and online information on crop profile, crop insurance and e-linkages to credit facilities/banks.

A comprehensive land record management system will also help resolve long pending arbitration cases and boundary-related disputes amicably, thus reducing the burden on the judiciary and the administration.

### **Other initiatives undertaken by the Department are as below:**

#### **I) National Generic Document Registration System (NGDRS)**

To provide, one Nation one software for registration of documents & properties to 'empower citizens', Department developed and field-tested a National Generic Document Registration System (NGDRS) through NIC/NICSI under the broad aegis of Digital India Land Records Modernisation Programme (DILRMP) a central sector scheme to include requirements of all the States and the same has been launched/under implementation in 10 states/Union Territories namely Andaman & Nicobar Islands, Dadra and Nagar Haveli, Goa, Himachal Pradesh, Jammu & Kashmir, Jharkhand, Maharashtra, Manipur, Mizoram and Punjab, benefiting 10.47 crore population.

The benefits are the reduction of land disputes, check on fraudulent transactions; Reduced process, time of document registration at Sub Registrar level as per reports from two state governments; processes and time taken in document registration has reduced from 9 to 6 processes and from 3-4 hours to 15-20 minutes respectively; presentation for document registration anywhere within concurrent jurisdiction is possible; SMS and email enabled alerts related to transactions on a property, a dashboard for senior authorities for monitoring the outcomes and analyzing the performance or challenges faced by SROs; data shared and used by important government authorities/stakeholders like the Revenue Department (Income Tax) with a data policy and standards in place; and external system integrations can be provided as required (i.e. eSign, eKYC, Payment Gateways, PAN Verification, ROR to fetch party names for data standardization)

NGDRS software is expected to improve the ranking of the country in ease of doing business in a world level forum and provide ease of living to the people.

#### **II) Unique Land Parcel Identification Number (ULPIN):**

The Unique Land Parcel Identification Number (ULPIN) System will have 14 digits – Alpha-numeric unique ID for each land parcel. The Unique IDs based on Geo reference coordinate of vertices of the parcel would be of international standard and compliance of the Electronic Commerce Code Management Association (ECCMA) standard and Open Geospatial Consortium (OGC) standards and it will provide compatibility so that all states can adopt it easily. Proper land statistics and land accounting through ULPIN will help develop land bank and lead towards Integrated Land Information Management System (ILIMS).

Benefits are to ensure uniqueness in all transactions and keep the land records always up-to-date; a link of all property transactions get established; delivery of citizen services of land records through the single window; sharing of land

records data across departments, financial institutions and all stakeholders; and standardization at data and application-level would bring in effective integration and interoperability across departments.

## 10. What the National Medical Commission's new guidelines say on admissions and quota for disabled people

### **Subject :Schemes**

**Context:** The panel was set up after the Delhi High Court, earlier this year, directed the NMC to explore the possibility of candidates with disability pursuing some disciplines, if not all, of medical education

**The new guidelines under development by the National Medical Commission (NMC):**

- The recommendations of a **16-member expert panel range from a “progressive outlook” for those with mental illness — suggesting that anyone who can complete all course requirements be allowed to study medicine — to “extremely restrictive” requirements for locomotor disabilities, suggesting wheelchair-bound people or those using two crutches be disqualified.**
- Much of **the recommendations do not talk of advancements in assistive devices** or treatments.
- Although some recommendations do make a mention of specific assistive devices such as cochlear implants for hearing impairment and telescopes and magnifiers for visual impairment
- **The existing guidelines say that anyone with more than 40% disability will be eligible for medical course and quota if their disability can be brought below the 40% mark with aids.**
- **the panel recommended that everyone should be allowed to pursue a medical course, and those with disability of more than 40% be allowed to compete for the 5% seats under the quota for persons with disabilities**
- **These recommendations are in line with disability guidelines that are followed in countries such as the UK**
- When it comes to locomotor disabilities — disability of bones, joints or muscles that restrict the movement of limbs — **the committee suggested removing the 80% disability cap for those who are allowed to pursue medical education, without really doing away with it.**
- It suggested that students will be allowed to pursue medical education if they are able to “perform activities and tasks involving sitting, standing, pulling, pushing, kneeling, crouching, lifting, bending, walking, and manipulation of fingers with dexterity
- **The guidelines also say that students dependent on wheelchairs and crutches will not be allowed to pursue medical education**
- **National Medical Commission:**
- **NMC will subsume the Medical Council of India and will regulate medical education and practice in India.**
- Functions of the NMC include: (i) **laying down policies for regulating medical institutions** and medical professionals, (ii) **assessing the requirements of human resources** and infrastructure in healthcare, (iii) ensuring compliance by the State Medical Councils with the regulations made under the Bill, and (iv) framing guidelines for determination of fee for up to 50% of the seats in the private medical institutions.
- **The NMC will consist of 25 members**, including: (i) Director General of the Directorate General of Health Services and the Indian Council of Medical Research, (ii) Director of any of the AIIMS, (iii) five members (part-time) to be elected by the registered medical practitioners, and (iv) six members appointed on rotational basis from amongst the nominees of the states in the Medical Advisory Council.
- **Four autonomous boards were set up under the supervision of the NMC.** Each board will consist of a President and four members (of which two members will be part-time), appointed by the central government (on the recommendation of a search committee).
- These bodies are:
- **The Under-Graduate Medical Education Board (UGMEB) and the Post-Graduate Medical Education Board (PGMEB):** These two bodies will be responsible for formulating standards, curriculum, guidelines for medical education, and granting recognition to medical qualifications at the under-graduate and post-graduate levels respectively.
- **The Medical Assessment and Rating Board:** The Board will have the power to levy monetary penalties on institutions which fail to maintain the minimum standards as laid down by the UGMEB and the PGMEB. It will also grant permissions for establishing new medical colleges, starting postgraduate courses, and increasing the number of seats in a medical college.
- **The Ethics and Medical Registration Board:** This Board will maintain a National Register of all the licensed medical practitioners in the country, and also regulate professional and medical conduct. Only those

included in the Register will be allowed to practice as doctors. The Board will also maintain a register of all licensed community health providers in the country.

#### **Additional info:**

#### **Rights of Persons with Disabilities Act, 2016**

The Act replaces the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995.

It fulfills the obligations to the United National Convention on the Rights of Persons with Disabilities (UNCRPD), to which India is a signatory

#### **Disabilities covered**

- Disability has been defined based on an evolving and dynamic concept.
- The types of disabilities have been increased from existing 7 to 21 and the Central Government will have the power to add more types of disabilities. The 21 disabilities are given below:-

#### **1. Physical Disability**

- Locomotor Disability
  - Leprosy Cured Person
  - Cerebral Palsy
  - Dwarfism
  - Muscular Dystrophy
  - Acid Attack Victims
- Visual Impairment
  - Blindness
  - Low Vision
- Hearing Impairment
  - Deaf
  - Hard of Hearing
- Speech and Language Disability

#### **2. Intellectual Disability**

- Specific Learning Disabilities
- Autism Spectrum Disorder

#### **3. Mental Behaviour (Mental Illness)**

#### **4. Disability caused due to-**

- Chronic Neurological Conditions such as
  - Multiple Sclerosis
  - Parkinson's Disease
- Blood Disorder
  - Haemophilia
  - Thalassemia
  - Sickle Cell Disease

#### **5. Multiple Disabilities**

- Persons with "benchmark disabilities" are defined as those certified to have at least 40 per cent of the disabilities specified above.

### **11. Digital Census and Self-enumeration through NPR Update**

#### **Subject : Schemes**

#### **Concept :**

- The article discusses implementation of a digital Census and the option for citizens to self-enumerate through updating their National Population Register (NPR) details online.
- Census 2021, the first digital Census, will allow citizens to "self-enumerate" when it is conducted.
- The government has not announced the date for the Census yet, and a notification from January 2, 2023, indicates that the exercise is postponed until at least September.



## National Population Register (NPR)

- The NPR is a register that records the **usual residents of the country**.
- It is prepared at various levels, including **local, sub-district, district, state, and national**.
- The creation of the **NPR is governed by the provisions of the Citizenship Act 1955 and the Citizenship (Registration of Citizens and issue of National Identity Cards) Rules, 2003**.
- It is **mandatory for every usual resident of India to register in the NPR**.
- A usual resident is defined as a person who has resided in a local area for the past 6 months or more, or a person intending to reside for next 6 months or more.

### Scope:

- The NPR exercise is conducted at the local, sub-district, district, state and national levels.
- The NPR will collect both demographic data and biometric data. Biometric data will be updated through Aadhar details.
- In the 2010 exercise, the RGI had collected only demographic details.
- In 2015, it updated the data further with the mobile, Aadhaar and ration card numbers of residents.
- For the 2020 exercise, it has dropped the ration card number but added other categories.

### Differences between NPR and Census

- The census involves a detailed questionnaire, collecting information such as age, sex, marital status, occupation, religion, and more.
- The NPR collects basic demographic data and biometric particulars.
- The census is governed by the Census Act, 1948, while the NPR operates under a set of rules framed under the Citizenship Act, 1955.


## 12. Rs 75 coin released on new Parliament inauguration day

### Subject : Schemes

#### Concept :

- To mark the inauguration of the new Parliament building, Prime Minister Narendra Modi released a **commemorative coin of Rs 75 denomination**.
- India has been issuing commemorative coins for several reasons such as paying homage to notable personalities, spreading awareness about government schemes, or remembering key historic events.
- The **country released its first commemorative coin in 1964 in honour of Jawaharlal Nehru**, who had passed away that year.
- **Minting of coins**
- The government has the power to design and mint coins in various denominations. It has been given this right under the Coinage Act, 2011.
- The government decides on the quantity of coins to be minted on the basis of indents received from the RBI on a yearly basis.
- The role of the RBI is limited to the distribution of coins that are supplied by the central government.
- Coins are minted in four mints owned by the Government of India in Mumbai, Hyderabad, Kolkata and Noida.
- **Printing of currency**
- Two of India's currency note printing presses are in Nasik and Dewas. These are owned by the Government of India.
- Two other printing presses are in Mysore and Salboni. These are owned by the RBI through its wholly owned subsidiary, Bharatiya Reserve Bank Note Mudran Ltd (BRBNML).
- **Commemorative coin**
- A commemorative coin is a special coin issued to honor and celebrate a particular event, person, or significant milestone.
- These Coins are distinct from regular circulation coins in that they are not intended for everyday transactions but rather serve as collectible items or gifts. These coins are primarily meant for numismatic purposes.
- **Minting :**
- The Government, through the Ministry of Finance, authorizes the issuance of commemorative coins to mark various occasions of national importance.
- These coins are minted by the Security Printing and Minting Corporation of India Limited (SPMCIL), which operates mints across the country.

- The RBI also issues special commemorative coins in limited quantities, primarily in precious metals, to honor eminent personalities, national achievements, or historical events.



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## Science and technology

### 1. Toxic gas kills 11 in Ludhiana

**Subject : Science and technology**

**Section: Health**

**Concept :**

- At least 11 people have died following a gas leak in Ludhiana, Punjab. The death is due to the **inhalation of neurotoxic gas**.
- **Hydrogen sulfide: Fast Facts**
- Hydrogen sulfide is a chemical compound with the **formula H<sub>2</sub>S**.
- It is a **colorless chalcogen-hydride gas**.
- It is **poisonous, corrosive, and flammable**, with trace amounts in ambient atmosphere having a characteristic foul odor of rotten eggs.
- Hydrogen sulfide is **slightly denser than air**. A **mixture of H<sub>2</sub>S and air can be explosive**.
- In general, hydrogen sulfide acts as a reducing agent.

#### **Effects**

- Hydrogen sulfide is toxic **to humans and most other animals by inhibiting cellular respiration**.
- When it is inhaled or its salts are ingested in high amounts, damage to organs occurs rapidly with symptoms ranging from breathing difficulties to convulsions and death.
- Despite this, the **human body produces small amounts of this sulfide** and its mineral salts, and uses it as a signaling molecule.

#### **Sources**

- Hydrogen sulfide is **often produced from the microbial breakdown of organic matter in the absence of oxygen, such as in swamps and sewers**; this process is commonly known as **anaerobic digestion**, which is done by sulfate-reducing microorganisms.
- It also **occurs in volcanic gases, natural gas deposits**, and sometimes in **well-drawn water**.
- It can also be associated with **animal farms, industrial plants, sewers or sewage treatment plants**.

## **2. G7 should adopt ‘risk-based’ AI regulation**

### **Subject :Science and Technology**

#### **Section: Awareness in IT**

#### **News in Brief**

- G7 advanced nations should adopt “risk-based” regulation on artificial intelligence, their digital ministers agreed in a joint statement issued at the end of a two-day meeting in Japan.
- They also insisted to “preserve an open and enabling environment” for the development of AI technologies and be based on democratic values.
- This comes as European lawmakers hurry to introduce an AI Act to enforce rules on emerging tools such as ChatGPT.
- Policy instruments to achieve the common vision and goal of trustworthy AI may vary across G7 members.
- The top tech officials from G7 – Britain, Canada, the EU, France, Germany, Italy, Japan and the United States – met in Takasaki, a city about 100 km (60 miles) northwest of Tokyo.

#### **ChatGPT**

- A generative AI tools
- A chatbot developed by Microsoft Corp-backed OpenAI
- Has become the fastest-growing app in history since its launch

#### **Future G7 discussions on generative AI**

- To be convened on topics like
- Governance
- How to safeguard intellectual property rights including copyright
- Promote transparency
- Address disinformation including information manipulation by foreign forces

#### **Previous Issues with AI Tools**

- Italy, a G7 member, took ChatGPT offline or banned it recently to investigate its potential breach of personal data rules. The move has inspired fellow European privacy regulators to launch probes. Italy lifted the ban.
- EU lawmakers agree a new draft of its upcoming AI Act, including copyright protection measures for generative AI. It may include labelling obligations for AI-generated images or music.

#### **Japan’s Positive View on AI**

- Japan took an accommodative approach on AI developers, pledging support for public and industrial adoption of AI.
- Hopes for G7 to agree on agile or flexible governance, rather than hindering, catch-all regulation over AI technology
- Japan while hosting the G7 Summit in Hiroshima in late May, will discuss AI rules with world leaders.

#### **About Takasaki**

- A transport and business hub
- A city of the daruma doll – associated with Shorinzan Darumaji Temple of Zen Buddhism. Daruma dolls – a popular handicraft and good luck charm, made from papier mache using a strong, fibrous traditional paper called washi, represented is the Bodhidharma – a legendary monk credited with bringing Buddhism to China.

#### **About G7**

- The **Group of Seven (G7)** is an inter-governmental political forum consisting of Canada, France, Germany, Italy, Japan, the United Kingdom, and the United States.
- Its members are the world's largest IMF advanced economies and wealthiest liberal democracies
- As of 2020, the collective group accounts for a little over 50% of global net wealth (which is \$418 trillion), 32 to 46 percent of global gross domestic product, and about 770 million people or 10 percent of the world's population
- Since the start of 2023, Japan has taken over the presidency of the G7. Germany was 2022 chair.
- The G7 was founded primarily to facilitate shared macroeconomic initiatives in response to contemporary economic problems.
- Following the global financial crisis of 2007–2008, G7 finance ministers pledged to take “all necessary steps” to stem the crisis.
- Presently, The G7 has continued to take a strong stance against Russia's “destabilising behaviour and malign activities” in Ukraine and elsewhere around the world

### **3. Detecting Breast Cancer Risk**

#### **Subject :Science and Technology**

#### **Section: Health**

#### **Why in news?**

A new study has found how breast tissue density plays a role in detecting breast cancer risk. A study has found that while breast density declines with age, a slower rate of decline in one breast often precedes a cancer diagnosis in that breast.

#### **What is Breast Cancer?**

- Breast cancer is a disease in which cells in the breast grow out of control. There are different kinds of breast cancer. The kind of breast cancer depends on which cells in the breast turn into cancer.
- Breast cancer can spread outside the breast through blood vessels and lymph vessels. When breast cancer spreads to other parts of the body, it is said to have metastasized.

#### **The common kinds of breast cancer are—**

**Invasive ductal carcinoma:** The cancer cells begin in the ducts and then grow outside the ducts into other parts of the breast tissue. Invasive cancer cells can also spread, or metastasize, to other parts of the body.

**Invasive lobular carcinoma:** Cancer cells begin in the lobules and then spread from the lobules to the breast tissues that are close by. These invasive cancer cells can also spread to other parts of the body.

#### **Causes of Breast cancer**

- Breast cancer is not a transmissible or infectious disease. Unlike some cancers that have infection-related causes, such as human papillomavirus (HPV) infection and cervical cancer, there are no known viral or bacterial infections linked to the development of breast cancer.
- Certain factors increase the risk of breast cancer including increasing age, obesity, harmful use of alcohol, family history of breast cancer, history of radiation exposure, reproductive history (such as age that menstrual periods began and age at first pregnancy), tobacco use and postmenopausal hormone therapy.

#### **Behavioural choices and related interventions that reduce the risk of breast cancer include:**

- Prolonged breastfeeding

- Regular physical activity
- Weight control
- Avoidance of harmful use of alcohol
- Avoidance of exposure to tobacco smoke
- Avoidance of prolonged use of hormones
- Avoidance of excessive radiation exposure.

Unfortunately, even if all of the potentially modifiable risk factors could be controlled, this would only reduce the risk of developing breast cancer by at most 30%.

### **India Facts**

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%).

### **Policies and schemes in India**

- In order to prevent and control major Non-Communicable Diseases (NCD), the **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS)** was launched in 2010 with focus on strengthening infrastructure, human resource development, health promotion, early diagnosis, management and referral.
- Under NPCDCS, **NCD Cells** are being established at National, State and District levels for programme management, and **NCD Clinics** are being set up at District and CHC levels, to provide services for early diagnosis, treatment and follow-up for common NCDs
- For the Cancer component, there is the **Tertiary Care Cancer Centers (TCCC) scheme**, which aims at setting up/strengthening of 20 State Cancer Institutes (SCI) and 50 TCCCs for providing comprehensive cancer care in the country. Under the scheme there is provision for giving a 'one time grant' of Rs. 120 crore per SCI and Rs. 45 crore per TCCC, to be used for building construction and procurement of equipment, with the Centre to State share in the ratio of 60:40 (except for North-Eastern and Hilly States, where the share is 90:10).

### **Treatment – WHO Guidelines**

WHO outlines three pillars of action with specific key performance indicators:

- Recommending countries to focus on breast cancer **early-detection programmes** so that at least **60 per cent of breast cancers** are diagnosed and **treated as an early-stage disease**.
- **Diagnosing breast cancer within 60 days of the initial presentation** can improve breast cancer outcomes. Treatment should start within three months of the first presentation
- **Managing breast cancer** so that at least **80 per cent of patients complete their recommended treatment**.

World Health Organization (WHO) announced an initiative called the "**Global Breast Cancer Initiative**". GBCI employs 3 key strategies to achieve these objectives: health promotion and early detection; timely diagnosis; and comprehensive breast cancer management. Through GBCI, WHO provides guidance to governments across the world on ways to strengthen systems for detecting, diagnosing and treating breast cancer, to further their capacities to manage other types of cancer.

### **Global Breast Cancer Initiative:**

#### **Aim**

- The initiative aims to reduce global breast mortality by 2.5% by 2040.
- The initiative will particularly focus on reducing deaths in low-income countries. There the progress to tackle the disease is relatively slow.

#### **Key Features of the Initiative:**

- **Guidance to Governments:** Under the initiative, WHO will work with other UN agencies. They will provide guidance to governments on how to strengthen systems for diagnosing and treating breast cancer. It is expected to improve capacities to manage other types of cancer.
- **Evidence-based Technical Package:** An evidence-based technical package will also be provided to countries as part of the initiative. It will incorporate existing WHO cancer tools and products.

### **Breast Density**



- The study published in JAMA Oncology finds that while breast density declines with age, a slower rate of decline in one breast often precedes a cancer diagnosis in that breast.
- Breast density is now an acknowledged risk factor for breast cancer, albeit one of many.
- Dense tissue also makes tumors harder to detect in imaging scans.

#### 4. Kyasanur forest disease

**Subject: Science and technology**

**Section: Biotechnology**

**Context:** Restoring Karnataka's forests can curb its monkey menace and Kyasanur disease outbreaks.

#### More on the News:

- Covid-19 pandemic has demonstrated the devastating impact of a zoonotic disease. While the way to avert such pandemics is to break the chain of transmission from wildlife to humans.
- One such zoonotic illness where spillover events appear to have increased, resulting in recurring outbreaks, is Kyasanur forest disease (KFD) or monkey fever.
- Researchers believe that the **disease was for centuries endemic to the forests of the Western Ghats**, circulating silently among primates and ticks. It was **first identified in 1957 after an outbreak in a Kyasanur forest village in Shivamogga district of Karnataka**.
- Though outbreaks have **remained largely confined to the area**, the disease in the past few decades has begun to spread to other states, with Tamil Nadu and Kerala reporting KFD for the first time in 2013, followed by Goa in 2015 and Maharashtra in 2016.
- Further analysis showed that the **prevalence of KFD and density of ticks are highest in areas where forests are degraded**. This shows that **habitat loss is the root cause of the increase in human-macaque conflicts** as well as KFD outbreaks.
- Over **70 per cent of forest land has been denotified for purposes like growing timber**.
- **Ecological restoration of such degraded forests** seems to be the only sustainable and ethical solution to mitigate the situation. This may be attained by **reconnecting wildlife corridors and forest fragments**, which in turn will minimise human-wildlife conflict.
- **In plantations, mature trees can be periodically removed in patches and native fruit trees be planted to restore the habitat**. With time, entire plantations can be converted into native forests, addressing the problems of macaque conflict and KFD.

#### Kyasanur forest disease

- Kyasanur Forest Disease (KFD), also known as **monkey fever**, is a **tick-borne viral disease** that primarily affects monkeys and humans.
- It was first identified in 1957 in the Kyasanur Forest in Karnataka, India.
- **Transmission:** KFD is **transmitted to humans through the bite of infected ticks** that primarily feed on monkeys. **Humans can also contract the virus through contact with the blood or tissues of infected animals**. Person-to-person transmission is rare.
- **Symptoms:** The symptoms of KFD in humans include **high fever, headache, muscle pain, and vomiting**. In severe cases, the disease can progress to hemorrhagic fever and neurological complications.
- **Prevention:** There is **no specific treatment for KFD**, and prevention is focused on reducing exposure to infected ticks. This includes wearing protective clothing, using tick repellents, and avoiding areas where ticks are prevalent. A **vaccine is available for individuals at high risk of exposure to the virus**, such as forest workers and healthcare workers.
- **Control measures:** The control measures for KFD include **surveillance for outbreaks, prompt diagnosis and treatment of cases**, and control of tick populations through measures such as habitat modification and use of acaricides (tick-killing chemicals).
- **Geographical spread:** KFD is endemic to certain regions in India, including parts of **Karnataka, Maharashtra, Kerala, Tamil Nadu, and Goa**. Outbreaks of the disease have also been reported in neighboring countries such as Sri Lanka and Malaysia.

#### 5. Antibiotic-resistant bacteria found in Sunderbans sediments

**Subject: Science and Technology**

**Section: Biotechnology**

**Context:** The diversity of antibiotic-resistant genes in the mangrove region of Sunderbans and Kerala is much higher than that of China.

### More on the News:

- Bacteria found in the sediments of the Sunderban delta region can **withstand antibiotics**, a new study has shown. The bacteria are **developing antibiotic-resistant genes (ARG)** due to the **constant dumping of waste and pollutants** in the network of waterbodies.
- Researchers found **bacteria such as Rhizobium, Marinobacter, Arthrobacter and Cycloclasticus** in the sample collected from five islands. **These bacteria are adept at degrading heavy pollutants such as polycyclic aromatic hydrocarbons (PAHs).**
- At least 42 ARGs were found at various levels in these bacteria where 17 resistance genes were enriched while 25 were depleted. The study also found the diversity of ARGs in the mangrove region of Sunderbans and Kerala to be much higher than that of China.

### 6. Psychedelic substances

**Subject : Science and technology**

**Section: Health**

**Concept :**

- Psychedelic drugs, banned in India under the Narcotic Drugs and Psychotropic Substances Act, are emerging in research as promising ways to treat treatment-resistant depression and post-traumatic stress disorder.
- **Psychedelics**
- Psychedelics are a **group of drugs that alter perception, mood, and thought-processing while a person is still clearly conscious.**
- Psychedelics are **non-addictive, non-toxic and compared to illicit drugs**, they are less harmful to the end user.
- In India, the **Narcotic Drugs and Psychotropic Substances Act 1985 prohibits the use of psychedelic substances.**
- **Ketamine**, a dissociative anaesthetic with psychedelic properties, is used under strict medical supervision, for anaesthesia and treatment-resistant depression.
- A psychiatrist named Humphrey Osmond first used the term 'psychedelic' in 1957.

**How do the drugs work in the body?**

- An **intriguing phenomenon called synaesthesia** may occur, where the **sensory modalities cross and the user may 'hear colour' or 'see sounds'.**
- **Psychedelics are neither stimulants nor depressants of brain activity.**
- Instead, they increase the cross-talk between different brain networks, and this correlates with the subjective effects of psychedelics.

**Can such substances cause harm?**

- **Death due to direct toxicity of psychedelics has not been reported.**
- Synthetic psychedelics have been associated with **acute cardiac, central nervous system, and limb ischaemia, as well as serotonin syndrome.**
- There have also **been reports of death attributed directly to synthetic psychedelic use.**

**Recent breakthroughs:**

- Recently, the **results from a phase II psilocybin trial found that a single 25-mg dose of psilocybin reduced depression scores** over three weeks in people with treatment-resistant depression.
- In 2017, the **U.S. Food and Drug Administration (FDA)** designated the use of **3,4-methylenedioxymethamphetamine, also known as MDMA**, to be the **breakthrough therapy in the treatment of post-traumatic stress disorder (PTSD).**
- In 2018, the **FDA had granted breakthrough therapy status to psilocybin for treatment-resistant depression** as well.
- If larger phase III trials establish their safety and therapeutic efficacy, the FDA and other regulatory bodies may clear these agents for routine clinical use.

### 7. Why Indian start-ups have accused IAMAI of spreading 'Big Tech propaganda'?

**Subject: Science and Technology**

**Section: Computers**

**Context:** There is a widening rift between some Indian start-ups and the industry body Internet and Mobile Association of India (IAMAI). Growing divide between Indian start-ups and the Big Tech, the former increasingly framing the debate as a foreign versus local issue.

### **What is IMAI?**

Established in 2004, the IMAI is a not-for-profit industry body and the country's only organization representing the digital services industry with over 500 Indian and multinational corporations as its members, which include established companies in diverse sectors of the digital ecosystem and start-ups. It represents varied sectors – digital advertising, digital entertainment, traveltech, online gaming, digital payments, fintech, digital commerce, edtech, healthtech, agritech, big data, ML, AI & IoT, AR/ VR, logistics-tech and so on.

### **What are Big Tech Companies (BTCs)?**

BTCs refer to the most dominant, prolific and largest technology companies in their respective sectors. Their products and services are used globally and have become heavily relied upon by businesses and individuals alike, bringing up privacy, safety and Antitrust concerns about their influence and operations. It typically includes GAFA (Google, Amazon, Facebook(Meta), Apple), Microsoft. May also include Alibaba, Tencent, Tesla, etc.

### **Systematically Important Digital Intermediaries**

The PSC on Finance recommended that India must identify the leading players in digital markets that can negatively influence competitive conduct. They should be categorised as Systemically Important Digital Intermediaries (SIDIs) based on their revenue, market capitalisation, and the number of active businesses and end users. SIDIs should annually submit a report to the Competition Commission of India (CCI) detailing the measures taken to comply with various mandatory obligations.

### **New Law to tackle Anti-competitive practices of BTCs**

The Committee recommended that the government should introduce a Digital Competition Act to ensure a fair, transparent, and contestable digital ecosystem.

### **Asia Internet Coalition (AIC)**

Established in 2010 as an industry association that promotes the understanding and resolution of Internet policy issues in the Asia Pacific region. Co-founded by eBay, Google, Nokia, Skype, and Yahoo! AIC lobbies government agencies to address public policy issues and facilitate the development of the internet economy in the Asia Pacific region.

### **Anti-Competitive Practices by Big Tech Companies**

**Self-preferencing:** An entity may have the dual role of providing the platform and competing on the same platform. Self-preferencing is a practice wherein a platform favours its own services or the services of its subsidiaries.

**Anti-steering:** Such provisions are clauses wherein a platform prevents its business users from steering its customers to offers other than those provided by the platform.

**Deep Discounting,** refers to a practice wherein an e-commerce company offers a heavy discount on a good or service that is sold in high quantities. This is possible due to high discounts got on bulk purchases by the e-commerce company from manufacturers.

**Search and Ranking Preferences:** If any product or service takes precedence in a list displayed, while searching in a platform, it indicates preference or search-bias in favour of those sponsored product or service or orders fulfilled by the platform itself.

## **8. Godfather of Artificial Intelligence (AI) cautions against its impact: How Geoffrey Hinton helped the development of AI**

**Subject: Science and Technology**

**Section: Computers**

**Context:**

Geoffrey Hinton, 75, announced his resignation from Google in a statement to the New York Times, saying he now regretted his work.

Hinton is not alone in voicing fears regarding AI. More than 1,000 technology leaders and researchers, including Apple co-founder Steve Wozniak and Tesla founder Elon Musk, signed an open letter calling for a six-month pause on the developing AI systems further, saying they “profound risks to society and humanity.”

**Machine Learning**

Machine learning is a branch of artificial intelligence (AI) and computer science that provides machines with the capacity to automatically learn from data and previous experiences by identifying patterns to generate predictions for new processes with minimal human intervention.

**Applications** – social media (Facebook), Transportation (Uber), Language Translation (Google Translate), Image or Speech Recognition (a machine can be fed thousands of images and then trained to identify what different animals or plants look like), Predicting Traffic Patterns, E-commerce Product recommendations, stock market and day trading, online fraud recognition, etc.

### Neural Network

A neural network is a method in artificial intelligence that teaches computers to process data in a way that is inspired by working of the human brain with its networks of neurons. It is a mathematical system that learns skills by analyzing data. It is a subset of machine learning, aiming to solve practical problems through novel learning algorithms.

The term ‘neural networks’ refers to “systems composed of layers of relatively simple computing elements called ‘neurons’ that are simulated in a computer.” These “neurons” only loosely resemble the neurons in the human brain, and influence one another – Association for Computing Machinery.

**Applications** – Speech Recognition, classify objects in images, machine translation, Chatbots answering a wide variety of questions, etc.

### Three Concerns with AI

Tools like ChatGPT may flood the internet with false photos, videos and text so that true data cannot be identified by the average internet user – Concerns of Misinformation. Over time machines may take over human jobs

AI are digital systems that have more capacity to instantaneously process large amounts of data, than the humans who are biological systems. In future such data can be used by “bad actors” for negative uses.

### Solutions Proposed

Companies must develop a set of shared safety protocols for advanced AI design and development, which can be overseen by independent outside experts.

A proper framework with a legal structure and fool proofing, including watermarking systems to help distinguish real from synthetic should be created.

Facts

Bard – Google’s AI Chatbot

## 9. Biosynthetic Clock

**Subject :Science and Technology**

**Section: Msc**

### Biosynthetic Clock

- A biosynthetic ‘clock’ keeps the body’s cells from getting old or in other words, reaching normal levels of deterioration related to ageing.
- Human lifespan relates to how quickly individual cells age. Recent research has shown that cells follow two distinct paths during ageing, and these are controlled by a central, genetic regulatory circuit.
- Manipulating these processes can be used to extend the lifespan of cells. Cells, including those of yeast, plants, animals and humans, all contain gene regulatory circuits that are responsible for many physiological functions, including ageing.
- Cells follow a variety of molecular changes through their entire lifespan until they eventually degenerate and die. But cells of the same genetic material and within the same environment can travel along distinct ageing routes.
- About half of the cells age through a gradual decline in the stability of DNA, where genetic information is stored. The other half ages along a path tied to the decline of mitochondria, the energy production units of cells. Thus directing the cell’s journey among these paths can significantly influence ageing.
- From its normal role of functioning like a toggle switch, these regulatory circuits can be engineered to generate a negative feedback loop to stall the ageing process. The rewired circuit operates as a clock-like device, called a gene oscillator, that drives the cell to periodically switch between two detrimental

“aged” states – or pathways–avoiding prolonged commitment to either, and thereby slowing the cell’s degeneration.

- These advances **resulted in a dramatically extended cellular lifespan**, setting a new record for life extension through genetic and chemical interventions.

## 10. A boost for science, a wider window to the universe

**Subject : Science and technology**

**Section : Mega science**

**Concept :**

- The **United States National Science Foundation** is partnering with top U.S. universities and **India’s Raja Ramanna Centre for Advanced Technology**, or RRCAT (a unit of Department of Atomic Energy, Government of India) to **launch LIGO-India**.

**Background**

- **General theory of relativity:** Albert Einstein’s 1916 general theory of relativity first predicted the phenomenon of gravitational waves. But it took physicists another century to prove the theory.
- **Failed to observe:** Most of the history of astronomy has been accomplished by observing light and the electromagnetic spectrum, everything from radio waves to infrared and visible light to high-energy x-rays and gamma rays, but gravitational waves are fundamentally different. They are ripples in space-time, the fabric of the universe itself.
- **First observation:** In 2015, for the first time in human history, physicists observed the gravitational waves emanating from two merging black holes, 1.3 million light years from earth.
- **Laser Interferometer Gravitational-Wave Observatory (LIGO)**
- LIGO is an international **network of laboratories that detect gravitational waves**.
- LIGOs are designed to measure changes in distance that are several orders of magnitude smaller than the length of the proton. Such high precision Instruments are needed because of the extremely low strength of gravitational waves that make their detection very difficult.

**First Detection of Gravitational Waves:**

- The **LIGO in the US first detected gravitational waves in 2015**, which led to a Nobel Prize in Physics in 2017.
- These **gravitational waves were produced by the merger of two black holes**, which were about 29 and 36 times the mass of the Sun, 1.3 billion years ago.
- Black hole mergers are the source of some of the strongest gravitational waves.
- **Operational LIGO:**
- Besides the **United States (in Hanford and Livingston)**, such gravitational wave observatories are **currently operational in Italy (Virgo) and Japan (Kagra)**.Fifth one to be setup in India.
- To detect gravitational waves, **four comparable detectors need to be operating simultaneously around the globe**.
- **Working Mechanism:**
- LIGO consists of two 4-km-long vacuum chambers, set up at right angles to each other, with mirrors at the end.
- When light rays are released simultaneously in both chambers, they should return at the same time.
- However, if a gravitational wave arrives, one chamber gets elongated while the other gets squished, causing a phase difference in the returning light rays.
- Detecting this phase difference confirms the presence of a gravitational wave.

**LIGO-India Project**

- The project aims to **detect gravitational waves from the**
- The **Indian LIGO would have two perpendicularly placed 4-km long vacuum chambers**, that constitute the most sensitive interferometers in the world.
- It is expected to begin scientific runs from 2030.
- It will be **located in the Hingoli district of Maharashtra**, about 450 km east of Mumbai.
- **Purpose and Significance:**
- It will be the **fifth node of the planned network and will bring India into a prestigious international scientific experiment**.



- It will make India a unique platform that brings together the frontiers of science and technology of the quantum and the cosmos.

#### Benefits of LIGO-India:

- By joining the global network, LIGO-India will push forward the boundaries of what science and technology can achieve and help unlock some of the universe's greatest mysteries.
- The LIGO-India project would have several spin-off benefits to Indian science, apart from making India an integral part of one of the most prestigious international scientific experiments.
- The observatory is expected to enable dramatic returns in astronomy and astrophysics, as well as leapfrog Indian science and technology in cutting-edge frontiers of great national relevance.

#### What are Gravitational Waves?

- Gravitational waves were first postulated (1916) in Albert Einstein's General Theory of Relativity, which explains how gravity works.
- These waves are produced by the movement of massive celestial bodies, such as black holes or neutron stars, and are the ripples in spacetime that propagate outward.

### 11. Fungal flood

#### Subject: Science and Tech

#### Section: Health

**Context:** Increasing disease, aided by climate change, risk to global food security.

#### More on the News:

- A **rapid surge in fungal attacks** on the world's most important crops, worsened by climate change, could become a "catastrophe" for the world's food supply, scientists have warned.
- The **five most important crops** for humanity — **rice, wheat, maize, soyabeans and potato** — are **vulnerable to fungal diseases** such as **rice blast fungus, wheat stem rust, corn smut, soybean rust and potato late blight**, all caused by water mould oomycete.
- The Food and Agricultural Organization has identified hundreds of fungal diseases that affect 168 crops crucial to provide nutrition to humans. The devastating impact of fungal diseases will worsen due to climate change, the researchers pointed out.
- The **rising temperatures are causing fungal infections to move steadily towards the poles**, about seven kilometres a year. Citing an example, they said wheat stem rust infections, usually reported in tropical countries, have been found in England and Ireland.
- Fungus, which is **primarily a pathogen, produce massive amounts of spores which can remain active in the soil for up to 40 years**, they added.
- Higher temperatures encourage the development of new fungal pathogen variants. Extreme weather conditions such as **storms or tornados can spread the spores in wider geographic ranges**, they stated. For instance, wheat stem rust produces airborne spores that can travel across continents.
- The scientists further claimed that **practising monoculture in modern agriculture had become ideal grounds for fungus to feed on entire crops and breed**. Such cropping patterns have **enabled the fungus to quickly evolve and develop resistance** to the fungicides.
- The **use of antifungals** has spiked in agriculture, **leading to more fungicide-resistant**
- The researchers expressed fears that **increasing temperatures due to global warming will change the relationship between plants and microbiomes**, including the endophytic fungi and organisms that co-exist in a single host plant. However, these can develop into fungi as a response to environmental stresses.
- The fungus can **threaten food security** as the **pressure on food systems increases with the growing human population**. The global population is estimated to grow to 9.7 billion in the next 30 years.
- Despite the threats, the **researchers hope to battle the situation by moving away from a single-target site fungicide approach to developing compounds that fight multiple pathogens**.

### 12. Scientists identify mutations in DNA for early diagnosis of drug-resistant bacteria for TB

#### Subject : Science and technology

#### Section: Health

#### Concept :

- According to the World Health Organization, India has the highest burden of Multi-Drug Resistant-TB (MDR-TB).
- There are nearly 0.39 million cases across the world.
- A group of scientists at **CSIR-Centre for Cellular & Molecular Biology (CCMB)** has observed that **mutations in DNA repair genes can be used for early diagnosis of MDR/XDR-TB.**
- It was **found through the whole genome sequencing of bacteria**, that perturbed DNA repair aids in the **acquisition of drug resistance in Mycobacterium Tuberculosis.**

### **Tuberculosis (TB)**

- Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis*.
- TB commonly affects the lungs (pulmonary TB) but can also affect other parts (extrapulmonary TB)
- Tuberculosis spreads from person to person through the air, when people who are infected with TB infection cough, sneeze or otherwise transmit respiratory fluids through the air.
- The most common risk factor associated with TB is HIV & other conditions that impair the immune system.
- Common symptoms of tuberculosis are Chronic cough with blood-tinged sputum, Loss of weight, Loss of appetite, Fever and night sweats, Fatigue, etc.

### **TB Treatment: consists of four drugs:**

- Isoniazid (INH)
- Rifampicin
- Pyrazinamide
- Ethambutol

### **Multidrug-Resistant TB (MDR-TB)**

- In MDR-TB, the bacteria that cause TB develop resistance to antimicrobial drugs used to cure the disease.
- **MDR-TB does not respond to at least isoniazid and rifampicin**, the 2 most powerful anti-TB drugs.
- Treatment options for MDR-TB are limited and expensive. CBNAAT (Cartridges Based Nucleic Acid Amplification Test) is used for early diagnosis of MDR-TB.

### **Extensively Drug-Resistant TB (XDR-TB)**

- XDR-TB is a form of **multidrug-resistant TB with additional resistance to more anti-TB drugs.**
- People who are resistant to isoniazid and rifampicin, plus any fluoroquinolone and at least one of three injectable second-line drugs (amikacin, kanamycin, capreomycin) are said to have XDR-TB.
- To achieve goal: To end TB by 2025

## **13. 10 Indian languages to get technical-term dictionaries**

### **Subject : Science and Technology**

#### **Concept :**

- The **Commission for Scientific and Technical Terminology (CSTT)** is dealing with **technical and scientific terminology in 10 Indian languages** that are under-represented in the field of education.
- It will introduce fundamental (basic) dictionaries in a span of three to four months. These dictionaries will contain 5000 words per language.
- The dictionaries will be digital and free of cost.
- The CSTT will print about 1000 to 2000 copies in each language.
- It should be noted that languages like **Bodo, Santhali, Dogri, Kashmiri, Konkani, Nepali, Manipuri, Sindhi, Maithili, and Sanskrit lack words to describe scientific and technical terms.**
- The initial task of CSTT is to cover 15 disciplines such as journalism, public administration, chemistry, botany, zoology, physics, computer science, engineering (civil and electrical), etc.
- It will further enable textbook formulation for middle, high, and university levels.
- The dictionaries will be distributed to education boards, universities, and testing agencies to aid in content preparation.

#### **About Commission for Scientific and Technical Terminology (CSTT):**

- CSTT was established on **October 01, 1961 in pursuance of a Presidential Order** dated April 27, 1960 with the objective to evolve technical terminology in all Indian Languages.
- It was established **under clause (4) of Article 344 of the Constitution of India.**
- It is functioning under **Department of Higher Education, Ministry of Education**, Government of India with its headquarters at New Delhi.

- **Primary Function: Evolve standard terminology, propagate its use and distribute it widely.**
- **Other functions:**
- Preparation and Publication of Bilingual and Trilingual Glossaries involving English/Hindi and other Indian Languages.
- Preparation and Publication of National terminology.
- Identification and Publication of School Level Terminology and Departmental Glossaries.
- Identification of **Pan Indian Terms.**
- Preparation of Definitional Dictionaries and Encyclopaedias.
- Preparation of University level textbooks, monographs and journals.
- **Grant-in-Aid to Granth Academies, Textbook Boards and University Cells** for University level books in regional languages.
- Propagation, expansion and critical review of terms coined and defined through training/orientation programmes, workshops, seminars etc.
- Free distribution of Publications.
- Providing necessary **terminology to the National Translation Mission.**
- In the process of evolution of **scientific and technical terminology and reference material in Hindi and Indian Languages**, the Commission shall have collaboration of State Governments, Universities, Regional Text-Book Boards and State Granth Academies.

#### 14. FDA approves first vaccine for respiratory syncytial virus

**Subject : Science and technology**

**Section: Health**

**Context:**

The first of several expected vaccine options for preventing respiratory syncytial virus, or RSV, in older adults has been approved by the FDA.

**What is Respiratory syncytial virus (RSV)?**

- It belongs to the genus **Orthopneumovirus** within the family **Pneumoviridae** and order **Mononegavirales**
- RSV is a **highly contagious virus that causes infections of the lungs and breathing passages** in individuals of all age groups. RSV circulation is seasonal, typically starting during the fall and peaking in the winter.
- In older adults, RSV is a common **cause of lower respiratory tract disease (LRTD)**, which affects the lungs and can cause life-threatening pneumonia and bronchiolitis (swelling of the small airway passages in the lungs)
- RSV is increasingly being recognized as an important pathogen in older adults, with infection leading to an increase in hospitalization rates among those aged 65 years and over, and to increased mortality rates among the frail elderly that approach the rates seen with influenza

**RSV Vaccine:**

The U.S. Food and Drug Administration approved **Arexvy, the first respiratory syncytial virus (RSV) vaccine approved for use in the United States.**

Arexvy is approved for the prevention of lower respiratory tract disease caused by RSV in individuals 60 years of age and older.

The shot, called Arexvy, is made by the British pharmaceutical company GSK.

**Two more vaccines for RSV by Pfizer and Moderna** have already completed clinical trials on adults older than 60 years and may soon be approved by the FDA.

**While the vaccine developed by Pfizer is protein based, Moderna has used mRNA technology**, like in the case of the SARS CoV2 vaccine, to develop the RSV vaccine.

#### 15. Scientists help find new kind of molecular motor

**Subject : Science and technology**

**Section: Health**

**Context:**

An international team of researchers, including from the National Centre for Biological Sciences (NCBS), Bengaluru, has reported a new kind of molecular motor.

### Concept:

- Cells have a fascinating feature to neatly organize their interior by using tiny protein machines called molecular motors that generate directed movements.
- Most of them use a common type of fuel, a kind of chemical energy, called ATP to operate.
- Now researchers from the **Max Planck Institute of Molecular Cell Biology and Genetics (MPI-CBG)**, the Cluster of Excellence Physics of Life (PoL) and the Biotechnology Center (BIOTEC) of the TU Dresden in Dresden, Germany, and the **National Centre for Biological Sciences (NCBS) in Bangalore, India**, discovered a novel molecular system that uses an alternative chemical energy and employs a novel mechanism to perform mechanical work.
- By repeatedly contracting and expanding, this molecular motor functions similarly to a classical Stirling engine and helps to distribute cargo to membrane-bound organelles
- It is the **first motor using two components, two differently sized proteins, Rab5 and EEA1, and is driven by GTP instead of ATP.**
- In a 2016 paper, researchers from Australia and Germany reported that when an enzyme called Rab5 binds to a long protein called EEA1, the protein loses its taut and rigid shape and becomes floppy. This 'collapse' pulls two membranes inside a cell closer to each other.
- In the new study, researchers have reported that **EEA1 regains its rigid shape in another mechanism so that it can become floppy again to pull the membranes closer, creating a new kind of two-part molecular motor.**
- When the 2016 paper was published, it was unclear whether EEA1 could resume its rigid shape, so that the whole process could repeat itself without the help of other proteins.
- The researchers of the latest study reported that EEA1 draws **energy from a reaction called GTP hydrolysis to become rigid again.** The GTP hydrolysis is mediated by enzymes called GTPases. Rab5 is one such.

### 16. Wastewater study detects a large, silent wave in Bengaluru

**Subject : Science and technology**

**Section: Health**

**Context:**

It appears that Bengaluru witnessed an invisible wave of COVID-19 that was far bigger than the third wave driven by BA.1 and BA.2 Omicron variants in January 2022. Based on 2,856 genome sequences from India posted on GISAID between December 1, 2022 and April 8, 2023, a team led by Dr. Rajesh P. Karyakarte, Head of the Microbiology Department at the BJ Medical College, Pune found that the XBB.1.16 lineage had grown from 9.3% in the first week of February to 79.17% in the first week of April

#### **How wastewater surveillance is helping the COVID-19 fight**

- People infected with SARS-CoV-2 can shed the virus in their feces, even if they don't have symptoms. The virus can then be detected in wastewater, enabling wastewater surveillance to capture presence of SARS-CoV-2 shed by people with and without symptoms.
- This allows wastewater surveillance to serve as an early warning that COVID-19 is spreading in a community.
- It is difficult to test everyone who has COVID-19, but it is easy to take a single wastewater test and you will have effectively tested everyone who lives in a particular area.

#### **National Wastewater Surveillance System (NWSS)**

- In response to the COVID-19 pandemic, **CDC (Centre for disease control and prevention)** launched the National Wastewater Surveillance System (NWSS) in September 2020.
- CDC developed NWSS to coordinate and build the nation's capacity to track the presence of SARS-CoV-2, the virus that causes COVID-19, in wastewater samples collected across the country.

#### **Global Initiative on Sharing All Influenza Data (GISAID)**

- The GISAID platform was launched on the occasion of the Sixty-first World Health Assembly in May 2008.
- GISAID is a **global science initiative and primary source for genomic data of influenza viruses and the novel coronavirus responsible for COVID-19.**

#### **Headquarters: Munich, Germany**

- In 2010 the Federal Republic of Germany became the official host of the GISAID platform and its database (named EpiFlu) providing sustainability of the platform and stability through its public-private-partnership with the GISAID Initiative to this day.

- In 2013 the European Commission recognized GISAID as a research organization and partner in the PREDEMICS consortium, a project on the Preparedness, Prediction and the Prevention of Emerging Zoonotic Viruses with Pandemic Potential using multidisciplinary approaches.

#### Key role:

- The Initiative ensures that **open access to data in GISAID is provided free-of-charge to all individuals that agreed to identify themselves and agreed to uphold the GISAID sharing mechanism governed through its Database Access Agreement.**

### 17. Space Science and Technology Awareness Training (START)

**Subject : Science and technology**

**Section :Space technology**

#### Concept :

- The Indian Space Research Organisation (ISRO) has announced a new introductory-level online training programme called **Space Science and Technology Awareness Training (START).**

#### Details

- The START programme is part of the ISRO's efforts to enable Indian students to become professionals in Space Science and Technology, as the organisation's Space Science exploration programme continues to expand into new domains.
- **START is aimed at postgraduate and final-year undergraduate students of Physical Sciences and Technology.**
- The programme will cover **various domains of Space Science, including Astronomy and Astrophysics, Heliophysics and Sun-Earth interaction, Instrumentation, and Aeronomy.** It will be delivered by scientists from Indian academia and ISRO centres.
- The programme is intended **to provide students with an introductory-level training** in Space Science and Technology, giving them an overview of different facets of the field, research opportunities, and career options.
- The training will also emphasize the cross-disciplinary nature of Space Science, giving students insights into how the individual aptitudes can be applied to the field.
- The lectures will also cover topics on the Indian Space Science exploration program and research opportunities in Space Science and technologies.

### 18. Minimising the threat from IEDs

**Subject : Science**

**Section: Defence**

#### Concept :

- On the 26th of April 2023, an improvised explosive device (IED) blast led to the death of about 10 security personnel in the Dantewada region in Chhattisgarh while they were on an anti-Maoist mission.
- Again on the 5th of May, five soldiers were killed in a gunfight with militants in the Rajouri-Poonch sector of the Jammu division and before the gunfight broke out an explosive device was triggered.

#### About Improvised Explosive Device (IED):

- IED is a type of **unconventional explosive weapon that can take any form and be activated in a variety of ways.**
- IEDs are **used by criminals, vandals, terrorists, suicide bombers, and insurgents.**
- Because they are improvised, **IEDs can come in many forms**, ranging from a small pipe bomb to a sophisticated device capable of causing massive damage and loss of life.
- IEDs can be **carried or delivered in a vehicle; carried, placed, or thrown by a person; delivered in a package; or** concealed on the roadside.
- The **extent of damage** caused by an IED depends **on its size, construction, and placement** and whether it incorporates a high explosive or propellant.
- The term IED came into common usage during the Iraq War that began in 2003.
- **Elements of an IED:**
- It consists of a variety of components that include an **initiator, switch, main charge, power source, and container.**



- IEDs may be surrounded by or packed with additional materials or “enhancements” such as nails, glass, or metal fragments designed to increase the amount of shrapnel propelled by the explosion.
- An IED can be initiated by a variety of methods depending on the intended target.
- **Materials Used as Explosives in IEDs:**
- Many commonly available materials, such as **fertilizer, gunpowder, and hydrogen peroxide, are used as explosive materials in IEDs.**
- Explosives **contain fuel and an oxidizer**, which provides the **oxygen needed to sustain the reaction.**

## 19. People are complaining about Mercury in retrograde. But what does it actually mean?

**Subject : Science and Technology**

**Section: Space technology**

**Context:**

- Humans found out retrograde motion was an optical illusion 500 years ago. However, the pseudoscientific practice of astrology continues to ascribe a deeper meaning to this illusion

**Concept:**

- When we say that a planet is in retrograde it means that from the perspective of Earth, a planet’s motion across the sky goes backwards night after night compared to its usual direction for a period of time.
- This happens when Earth overtakes a slower-moving planet in its orbit around the Sun, or is overtaken by a faster-moving planet.
- **Retrograde motion is technically called “apparent retrograde motion” since it’s not an actual change in the planet’s motion through space, but rather an effect caused by our perspective from Earth.**
- **What causes Retrograde Motion?**
- Every planet moves around the Sun in the same direction. Normally, when you observe a planet’s location in the sky over several nights, each night it will appear to have moved a little farther in one direction relative to the stars behind it.
- When a planet is in retrograde, it appears to move a little farther to the opposite direction each night instead.
- This happens because the closer a planet is to the Sun, the faster it moves in its orbit around the Sun. **This means that Mercury and Venus move through space more quickly than Earth, and will occasionally lap Earth just like runners moving more quickly around a track.**
- Likewise, the more distant planets Mars, Jupiter, Saturn, Uranus, and Neptune all move slower than Earth, and will occasionally be lapped by Earth.
- Just like runners on a track, when a faster runner catches up to and then overtakes a slower one, the slower one’s motion relative to the faster one is backwards, even though both are moving forwards.
- **What does it mean when we say Mercury is “in retrograde”?**
- **Retrograde motion works a little differently for Venus and Mercury.** Because these planets orbit between Earth and the Sun, we tend not to see them high in the night sky. We mostly see them in the morning or evening, when they aren’t either directly between us and the Sun or on the far side of the Sun.
- Most of the time, both planets move from east to west in Earth’s skies. But as Mercury, for example, speeds past Earth in its super-fast orbit and starts to turn around the Sun to pass to the other side, we see it slow in its east-to-west motion and start to move in the opposite direction as it takes that turn.
- Because **Mercury only takes 88 days to orbit the Sun compared to Earth’s 365, it overtakes us in this way three to four times a year, appearing to move backwards for about three weeks at a time.** This frequency is probably the reason that Mercury’s is the most famous of the retrogrades

## 20. 25th anniversary of Pokhran-II: India’s journey to become a nuclear power

**Subject: Science and tech**

**Section: Nuclear energy**

**Context:**

India successfully conducted three nuclear bomb test explosions at the testing site in Pokhran on May 11, 1998. While these tests caused an international outcry at the time, they cemented India’s status as a nuclear power

**India’s Nuclear Journey:**

- India’s nuclear programme can be traced to the work of physicist **Homi J Bhaba**. In 1945, after Bhaba’s successful lobbying of India’s biggest industrial family, the Tata Institute of Fundamental Research was opened in Bombay. **TIFR was India’s first research institution dedicated to the study of nuclear physics.**
- Post independence, with continuous effort from **Homi J Bhaba in 1954, the Department of Atomic Energy (DAE) was founded, with Bhabha as director.**

- A pivotal moment in India's nuclear journey came after it suffered a **crushing defeat in the 1962 Sino-Indian War** and China's subsequent nuclear bomb test at Lop Nor in 1964.
- Prime Minister Lal Bahadur Shastri first tried to attain nuclear guarantees from established nuclear weapons states, when such guarantees did not emerge, a different route had to be taken.
- Things were further accelerated, when in 1965, India went to war with Pakistan once again, with China openly supporting Pakistan this time. Effectively, India was surrounded by two unfriendly nations, and needed to take steps towards building self-sufficiency.
- By the 1960s, discourse around nuclear disarmament and non-proliferation had shifted to the mainstream as the Cold War arms pushed the US and the USSR to great extremes.
- After China successfully tested its own bomb, there was increasing international consensus among the big powers regarding the need for a non-proliferation treaty.

#### The “discriminatory” NPT

- **In 1968, the Non-Proliferation Treaty (NPT)** came into existence.
- The treaty **defines nuclear-weapon states** as those that have built and tested a nuclear explosive device before **January 1, 1967 – the US, Russia (formerly USSR), the UK, France and China** – and effectively disallows any other state from acquiring nuclear weapons.
- While the treaty has been signed by almost every country in the world, **India is one of the non signatories.**

#### Pokhran-I and its aftermath

- By the 1970s, India was capable of conducting a nuclear bomb test. Bhaba's successor at the DAE, Vikram Sarabhai had worked to significantly broaden India's nuclear technology.
- **On May 18, 1974, with support from Indira, India carried out its first nuclear test at the Pokhran test site. Pokhran-I, codenamed Operation Smiling Buddha,** would be billed as a “peaceful nuclear explosion”, with “few military implications”.
- However, there was near-universal condemnation and countries like the US and Canada imposed significant international sanctions on India. These sanctions would be a major setback for India's nuclear journey, and majorly decelerate its progress.
- **In 1983, the Defence Research and Development Organisation's (DRDO) funding was increased and Dr APJ Abdul Kalam was put in charge of India's missile programme.**
- That year, India also developed capabilities to reprocess plutonium to weapons grade. Furthermore, throughout the decade, India exponentially increased its plutonium stockpiles.
- **With the fall of the USSR in 1991, India lost one of its biggest military allies, since the time Indira Gandhi had signed a 20-year security pact with it in 1971.**
- Furthermore, the US continued to provide military aid to Pakistan despite its own misgivings with its nuclear weapons programme.

#### Pokhran-II: projecting India's strength

- In March 1998, Pakistan launched the Ghauri missile – built with assistance from China. Two months later, **India responded with Operation Shakti.**
- While the 1974 tests were ostensibly done for peaceful purposes, **the 1998 tests were the culmination of India's nuclear weaponisation process.** Consequently, the Indian Government declared itself as a state possessing nuclear weapons following Pokhran-II.
- While the tests in 1998 also invited sanctions from some countries (like the US), the condemnation was far from universal like in 1974.

### 21. U.K. sees success in mitochondrial replacement therapy

#### **Subject : Science and technology**

#### **Section: Health**

#### **Concept :**

- The United Kingdom was the first country to approve a reproductive technique known as **Mitochondrial replacement therapy (MRT).**
- The Human Fertilisation and Embryology Authority (HFEA) reported that “less than 5” children have been born using the procedure.
- HFEA is a fertility regulator in the U.K. that approves In Vitro Fertilization (IVF) based procedures on a case-by-case basis.
- In 2022, Australia became the second country to approve the MRT procedure.

- **About Mitochondrial Replacement Therapy (MRT):**
- It is a new form of reproductive in-vitro fertilization (IVF) which works on the **principle of replacing a women's abnormal mitochondrial DNA (mt-DNA) with the donor's healthy one.**
- **People have two types of DNA in their cells, nuclear DNA,** which is inherited from both parents and **mitochondrial DNA (mtDNA),** which is **inherited only from the mother.**
- MRT is **designed to prevent women who are carriers of mitochondrial diseases** from passing on these heritable genetic diseases to their children.

#### How is MRT carried out?

- MRT involves **using an egg from an egg donor who doesn't have mutations.**
- The nucleus of the egg is removed and replaced with the nuclear DNA from the woman who has mitochondrial DNA mutations.
- The egg is then fertilized with the father's sperm in the embryology lab.
- If it grows into an embryo for transfer during IVF treatment, the embryo would be free of mitochondrial disease.

#### Mitochondria:

- Mitochondria are **membrane-bound cell organelles that generate most of the chemical energy needed to power the cell's biochemical reactions.**
- Mitochondria are often **referred to as the powerhouses of the cell.**
- **Chemical energy produced** by the mitochondria is **stored in a small molecule called adenosine triphosphate (ATP).** ATP is the chemical energy "currency" of the cell that powers the cell's metabolic activities.
- Generally, mitochondria, and therefore mitochondrial DNA, are inherited only from the mother.

## 22. Storm Shadow Missile

**Subject :Science**

**Section: Defence**

#### Concept:

- Russia's Defence Ministry recently said that **Ukrainian aircraft had struck two industrial sites in the Russian-held city of Luhansk in eastern Ukraine** with Storm Shadow missiles supplied by Britain.

#### About Storm Shadow Missile:

- It is a **long-range cruise missile** with stealth capabilities, jointly developed by the UK and France.
- The missile is intended to strike high-valued stationary assets such as airbases, radar installations, communications hubs and port facilities.
- Able to be operated in extreme conditions, the weapon offers operators a highly flexible, deep-strike capability based on a sophisticated mission planning system.
- The Storm Shadow is also in service with the air forces of Egypt, India, Italy, Greece, Saudi Arabia, Qatar and the United Arab Emirates (UAE).

#### Features:

- It is **typically launched from the air.**
- It carries a 450kg conventional warhead to a range of up to 200 miles (300km).
- The missile weighs 1.3 tonnes and is just over 5m long.
- It is **equipped with fire-and-forget technology and fully autonomous guidance.**
- The missile is fitted with a passive imaging infrared seeker.
- The missile is programmed with every detail of the target and the path to be taken to reach the target prior to its launch.
- Once launched, the Storm Shadow drops to a low altitude to avoid detection by enemy radar before latching onto its target with the infrared seeker.

## 23. Gaganyaan

**Subject: Science and Technology**

**Section: Space technology**

**Context:** Indigenously developed parachutes for the safe return of the capsule that will carry astronauts under the proposed Gaganyaan programme are set to undergo fitment tests at an Indian Space Research Organisation (ISRO) facility in Bengaluru.

**Details:**

- **The Aerial Delivery Research and Development Establishment (ADRDE)**, the Agra-based laboratory under the **Defence Research and Development Organisation (DRDO)**, has developed the parachutes for India's manned space flight programme, Gaganyaan, which envisages putting a crew of three astronauts in low-earth orbit.
- The parachute configuration consists of 10 parachutes.
- During flight the sequence starts with deployment of two parachutes of "apex cover separation parachute", which is protection cover for the crew module parachute compartment, followed by two more of "drogue parachute deployment" to stabilise and bring down the velocity.
- Upon the drogue parachute release, three parachutes of the "pilot parachute" system will be used to extract three parachutes of the "main parachute" individually, to reduce the speed of the crew module to safe levels during its landing, the statement explained.
- Stating that each parachute's performance must be evaluated by complex testing methods, the ADRDE said that individual parachutes have undergone sub-system level testing.
- India's maiden human space flight 'H1' mission is targeted to be launched in the fourth quarter of 2024. In view of the paramount importance of crew safety, two test vehicle missions are planned before the 'G1' mission to demonstrate the performance of crew escape system and parachute-based deceleration system for different flight conditions.
- "The uncrewed 'G1' mission is targeted to be launched in the last quarter of 2023 followed by the second uncrewed 'G2' mission in the second quarter of 2024, before the final human space flight 'H1' mission in the fourth quarter of 2024," he stated.
- The first uncrewed flight 'G1' mission is aimed at validating the performance of human-rated launch vehicle, orbital module propulsion system, mission management, communication system and recovery operations. The mission will carry a humanoid as payload.
- The astronaut-designates for the human space flight mission are currently undergoing their mission-specific training at Bengaluru with the second semester of crew training currently underway. The first semester of astronaut training included modules on theoretical basics, space medicine, launch vehicles, spacecraft system and ground support infrastructure. Regular physical fitness sessions, aeromedical training and flying practice are also part of crew training. Corresponding evaluation and assessment activities have also been completed.

**Gaganyaan**

- Gaganyaan project envisages demonstration of human spaceflight capability by launching crew of 3 members to an orbit of 400 km for a 3 days mission and bring them back safely to earth, by landing in Indian sea waters.
- The project is accomplished through an optimal strategy by considering inhouse expertise, experience of Indian industry, intellectual capabilities of Indian academia & research institutions along with cutting edge technologies available with international agencies. The pre-requisites for Gaganyaan mission include development of many critical technologies including human rated launch vehicle for carrying crew safely to space, Life Support System to provide an earth like environment to crew in space, crew emergency escape provision and evolving crew management aspects for training, recovery and rehabilitation of crew.
- Various precursor missions are planned for demonstrating the Technology Preparedness Levels before carrying out the actual Human Space Flight mission. These demonstrator missions include Integrated Air Drop Test (IADT), Pad Abort Test (PAT) and Test Vehicle (TV) flights. Safety and reliability of all systems will be proven in unmanned missions preceding manned mission.

**Human related LMV3**

- LVM3 rocket – The well proven and reliable heavy lift launcher of ISRO, is identified as the launch vehicle for Gaganyaan mission. It consists of solid stage, liquid stage and cryogenic stage. All systems in LVM3 launch vehicle are re-configured to meet human rating requirements and christened Human Rated LVM3. HLVM3 will be capable of launching the Orbital Module to an intended Low Earth Orbit of 400 km.
- HLVM3 consists of Crew Escape System (CES) powered by a set of quick acting, high burn rate solid motors which ensures that Crew Module along with crew is taken to a safe distance in case of any emergency either at launch pad or during ascent phase.

**Orbital Module**

- Orbital Module (OM) that will be Orbiting Earth comprises of Crew Module (CM) and Service Module (SM). OM is equipped with state-of-the-art avionics systems with adequate redundancy considering human safety.
- CM is the habitable space with Earth like environment in space for the crew. It is of double walled construction consisting of pressurized metallic Inner Structure and unpressurised External Structure with Thermal Protection System (TPS). It houses the crew interfaces, human centric products, life support system, avionics and deceleration systems. It is also designed for re-entry to ensure safety of the crew during descent till touchdown.
- SM will be used for providing necessary support to CM while in orbit. It is an unpressurized structure containing thermal system, propulsion system, power systems, avionics systems and deployment mechanisms.

#### Crew training

- Astronaut Training Facility established in Bengaluru caters to Classroom training, Physical Fitness training, Simulator training and Flight suit training. Training modules cover academic courses, Gaganyaan Flight Systems, Micro-gravity familiarization through Parabolic Flights, Aero-medical training, Recovery & Survival training, mastering of Flight Procedures and training on Crew Training Simulators. Aero medical training, Periodical flying practice and Yoga are also included as part of the training.

#### 24. How old are Saturn's rings? New research has answers

##### **Subject: Science and Technology**

##### **Section: Space technology**

**Context:** Researchers have pegged the planet Saturn's rings' age at no more than 400 million years old

##### **What are the new findings?**

- **Saturn's rings are remarkably young, much younger than Saturn itself, which is about 4.5 billion years old.**
- The researchers arrived this by studying tiny grains of rocky material washing through the Earth's solar system on an almost constant basis.
- In some cases, this flux can leave behind a thin layer of dust on planetary bodies, including on the ice that makes up Saturn's rings
- Think about the rings like the carpet in your house. "If you have a clean carpet laid out, you just have to wait. Dust will settle on your carpet. The same is true for the rings
- **Scientists used an instrument called the Cosmic Dust Analyzer aboard US's NASA's late Cassini spacecraft to analyse specks of dust flying around Saturn**
- Based on calculations on the 163 grains collected over those 13 years, all of which had originated from beyond the planet's close neighborhood, Saturn's rings have likely been gathering dust for only a few hundred million years
- Saturn hosts seven rings comprised of countless chunks of ice, most no bigger than a boulder on Earth
- **The spacecraft Cassini first arrived at Saturn in 2004 and collected data until it purposefully crashed into the planet's atmosphere in 2017.**

##### **Concept:**

##### **What is Saturn Rings?**

- Saturn's rings are **thought to be pieces of comets, asteroids, or shattered moons that broke up before they reached the planet, torn apart by Saturn's powerful gravity**
- They are made of billions of small chunks of ice and rock coated with other materials such as dust
- The ring particles mostly range from tiny, dust-sized icy grains to chunks as big as a house. A few particles are as large as mountains.
- The rings would look mostly white if you looked at them from the cloud tops of Saturn, and interestingly, each ring orbits at a different speed around the planet.

##### **Additional Information:**

- Saturn is made mostly **of hydrogen and helium.**
- At Saturn's center is a dense core of metals like iron and nickel surrounded by rocky material and other compounds solidified by intense pressure and heat.
- It is **enveloped by liquid metallic hydrogen inside a layer of liquid hydrogen**
- **Saturn is the only planet in our solar system with an average density that is less than water.**



- As a gas giant, Saturn doesn't have a true surface. The planet is mostly swirling gases and liquids deeper down

## 25. Mitochondrial Replacement Therapy (MRT)

**Subject : Science and technology**

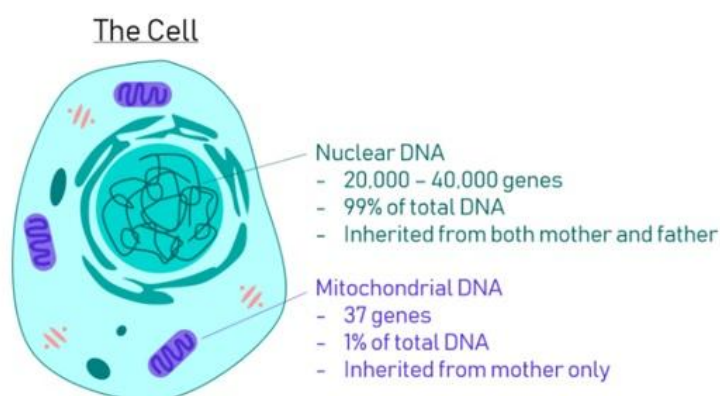
**Section: Biotechnology**

**Concept :**

- **Mitochondrial replacement therapy (MRT)** is a new form of reproductive invitro fertilization (IVF) which works on the principle of replacing a women's abnormal mitochondrial DNA (mt-DNA) with the donor's healthy one.

**What are Mitochondrial Disorders?**

Just as our bodies have organs that perform particular functions, each cell within the body has small structures, aptly termed organelles, which have specific, life-sustaining jobs. For example, one of the primary organelles in each cell is the nucleus, which contains our DNA, or genetic information. Another type of organelle is mitochondria, which function to provide our cells, and thus our bodies, with energy. Interestingly, mitochondria also contain a very small amount of DNA, making them the only organelle other than the nucleus to house genetic information



Similar to nuclear DNA, mitochondrial DNA serves an important purpose, namely providing the genetic blueprint for molecular machines called proteins that carry out cellular functions. However, this capacity of mitochondria to carry DNA also makes them a genetic liability of sorts. Specifically, just like nuclear DNA, mitochondrial DNA is susceptible to mutations in the DNA code that can cause disease. If these DNA mutations lead to the production of damaged mitochondrial proteins, they can cause a class of diseases termed **mitochondrial disorders**.

Mitochondrial disorders are fairly common, affecting at least 1 in 5,000 births in the United States, and they exhibit a very unique inheritance pattern. Unlike nuclear DNA, which is passed in equal parts to a child from both parents, mitochondria are inherited solely from mothers. As such, if a mother has damaged mitochondrial DNA, she will pass this on to all of her children causing disease of a varied severity depending on the proportion of healthy and damaged mitochondria the child randomly inherits

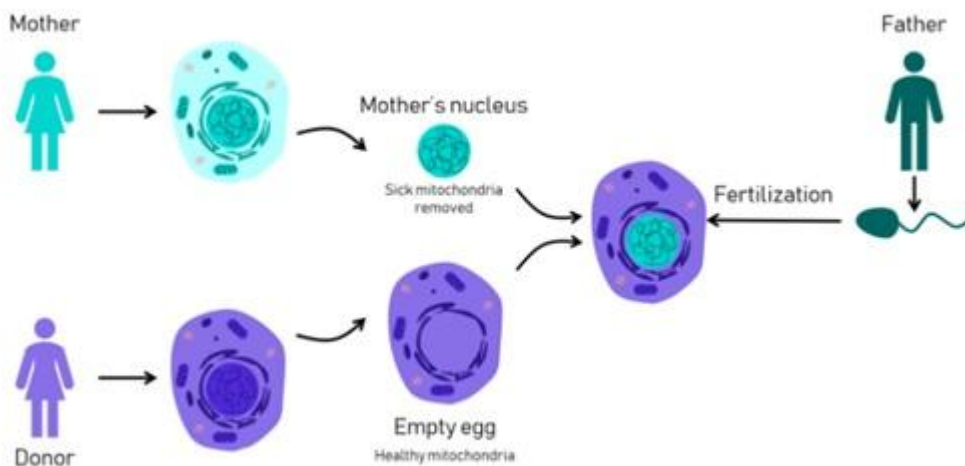
To avoid this, scientists have developed techniques that allow them to use mtDNA from a donor, along with DNA from a mother and father. These are generally called mitochondrial replacement therapies, or MRT.

There are a few different ways of doing this, but most teams use one of two approaches. Some scoop out the nuclei of two eggs, one from a prospective parent and one from a donor. Then they put the would-be parent's nucleus into the egg of the donor, which still contains the cytoplasm, the fluid outside the nucleus that holds the mitochondria. The resulting egg can then be fertilized with sperm, creating an embryo that technically has three genetic parents.

**Step-by-Step Process –**

- First, sperm from the father is used to fertilise eggs from the affected mother and a healthy female donor.
- The nuclear genetic material from the donor's egg is then removed and replaced with that from the couple's fertilised egg.
- The resulting egg has a full set of chromosomes from both parents, but carries the donor's healthy mitochondria instead of the mother's faulty ones.
- This is then implanted in the womb.

- The resulting baby has DNA from the mother and father as usual, plus a small amount of genetic material – about 37 genes – from the donor.
- The process has led to the phrase “three-parent babies”, though more than 99.8% of the DNA in the babies comes from the mother and father.
- The development of healthy baby free from genetic disorders and to terminate the lethal mitochondrial disorders is the chief motive of this technique.



### Is MRT Procedure Risk-Free?

- The **procedure is not without risks.**
- Recent research has found that in some cases, the tiny number of abnormal mitochondria that are inevitably carried over from the mother's egg to the donor egg can multiply when the baby is in the womb.
- So-called reversion or reversal could lead to a disease in the child.
- So far, the clinical experience with MRT has been encouraging, but the number of reported cases is far too small to draw any definitive conclusions about the safety or efficacy.
- Long-term follow-up of the children born through MRT is essential.

### Legality of MRT:

- The United Kingdom, in 2016, became the first country in the world to legalise MRT.
- Last year, Australia became the second country to approve this therapy.
- In the United States, the therapy is illegal as it is considered as a form of genetic modification, and changes made to eggs, and sperm and embryos — known as germline modification — can be passed on to future generations.

### Mitochondrial Diseases

- Certain defects might occur impacting on the way the mitochondria produces energy for the cells (Specially in the 'energy-hungry' tissues of the brain, nerves, muscles, kidneys, heart, liver), and thereby impacting cell function.
- The **diseases that arise out of such mitochondrial mutations are called mitochondrial diseases.**

- When the mitochondria are impaired and do not produce sufficient energy, that affects how the organs function, leading to a broad assortment of symptoms across the body, including brain damage, organ failure and muscle wastage.
- **Mitochondria makes up less than 0.0005% of our entire DNA. But since the child receives it only from the mother, any aberrations in her mitochondrial DNA that may cause diseases is passed on completely to the child.**
- According to the New York Stem Cell Foundation Research Institute, approximately 1 in 5,000-10,000 children are born each year with mitochondrial disease.

## 26. MoD approves 4th Positive Indigenization List for DPSUs

**Subject : Science and Technology**

**Section: Defense**

**Concept :**

- Defence Ministry has approved the **4th Positive Indigenisation List (PIL)** of 928 strategically-important Line Replacement Units (LRUs), sub-systems, spares and components, including high-end materials and spares, with import substitution value worth ₹715 crore, a Ministry statement said on Sunday.
- These will **only be procured from the Indian Industry after the timelines** indicated on the list.

### **Building upon Previous PILs**

- The **4th Positive Indigenisation List is a continuation of the previous three PILs** that were published in December 2021, March 2022, and August 2022, respectively.
- Combined, these lists have already facilitated the indigenisation of 2,500 items.
- The current PIL aims to further indigenize 1,238 items within the specified timelines. This progressive approach showcases the steady growth of indigenous manufacturing capabilities in the defence sector.

### **Positive Indigenisation List (PIL)**

- The positive indigenisation list essentially means that the Armed Forces—Army, Navy, and Air Force—will only procure the listed items from domestic manufacturers.
- The manufacturers could be private sector players or Defense Public Sector Undertakings (DPSUs).
- This concept was **rolled out in the Defence Acquisition Procedure (DAP) 2020.**

### **Potential Benefits:**

- It will give a **boost to indigenisation** with active participation of public and private sector for fulfilling the twin objectives of achieving self-reliance (Atmanirbhar Bharat) and promoting defence exports.
- **Import substitution of ammunition** which is a recurring requirement has been given special focus.
- Not only does the list recognise the potential of the local defence industry, it will also invigorate impetus to domestic Research & Development by attracting fresh investment into technology and manufacturing capabilities.
- It also provides an excellent opportunity for 'start-ups', as Micro, Small, and Medium Enterprises (MSMEs) will get a tremendous boost from this initiative.

## 27. Gaps in the AePS transaction model

**Subject: Science and Technology**

**Section: Awareness in IT**

**Concept:**

### **Aadhaar-enabled Payment Services**

- **Aadhaar-enabled Payment Services (AePS)** is a bank-led model which **allows online financial transactions at Point-of-Sale (PoS) and Micro ATMs** through the business correspondent of any bank using Aadhaar authentication.
- There is **no need for OTPs, bank account details, and other financial details for AePS.**
- It allows **fund transfers using only the bank name, Aadhaar number, and fingerprint captured during Aadhaar enrolment.**

### **Are AePS transactions enabled by default?**

- **Neither Unique Identification Authority of India (UIDAI) nor NPCI mentions clearly whether AePS is enabled by default.**

- According to UIDAI, **users who wish to receive any benefit or subsidy under schemes notified under section 7 of the Aadhaar Act, have to mandatorily submit their Aadhaar number to the banking service provider.**
- Aadhaar is also the preferred method of KYC for banking institutions, thus enabling AePS by default for most bank account holders.

#### How is biometric information leaked?

- While data breaches in Aadhaar have been reported in 2018, 2019, and 2022, according to UIDAI the Aadhaar data, including biometric information, is fully safe and secure.
- However, **UIDAI's database alone is not the only location where data can be leaked.**
- Aadhaar numbers are readily available in the form of photocopies, and soft copies, and criminals are using Aadhaar-enabled payment systems to breach user information.

#### How the Aadhaar biometric information could be secured?

- **Aadhaar (Sharing of Information) Regulations, 2016:** The UIDAI is proposing an amendment to the regulations, which will require entities in possession of an Aadhaar number to not share details unless the Aadhaar numbers have been redacted or blacked out through appropriate means, both in print and electronic form.
- **Authentication:** The UIDAI has also implemented a new two-factor authentication mechanism that uses a machine-learning-based security system, combining finger minutiae and finger image capture to check the liveness of a fingerprint.
- **Locking Aadhaar:** Additionally, users are also advised to ensure that they lock their Aadhaar information to ensure that their biometric information, even if compromised, cannot be used to initiate financial transactions.
- Aadhaar can be unlocked when the need for biometric authentication arises, such as for property registration and passport renewals, after which it can again be locked..

### 28. Transformer; the ML model that powers ChatGPT

**Subject : Science and technology**

**Section : Awareness of IT**

**Concept :**

#### **Machine Learning (ML)**

- Machine learning (ML), **a subset of artificial intelligence, trains computers to perform tasks using structured data, language, audio, or images by presenting examples of inputs and their corresponding desired outputs.**
- Unlike traditional computer programming that relies on explicit instructions, ML models learn to generate desired outputs by adjusting numerous parameters, often in the millions.
- This enables the model to generalize its knowledge and make predictions or generate responses based on new inputs.
- ML's ability to learn from data and adapt its behavior makes it a powerful tool for solving complex problems and handling diverse types of information.

#### **What is 'attention'?**

- Attention is **a fundamental concept in machine learning that enables a model to determine the importance of different inputs.**
- For example, in translation tasks, attention allows the model to select and weigh words from its memory bank, aiding in the decision of the next word to generate. Similarly, when describing an image, attention helps the model focus on relevant parts of the image while generating subsequent words.
- A similar observation applies to **image captioning.**
- For an image of a "bird flying above water", the model is never told which region of the image corresponds to "bird" and which "water".
- **Instead, by training on several image-caption pairs with the word "bird", it discovers common patterns in the image to associate the flying thing with "bird".**
- One captivating aspect of **attention-based models** is their **ability to discover meaningful patterns and relationships through extensive data analysis.** By parsing large volumes of data, these models uncover valuable insights and learn intricate dependencies.

#### **Transformers**

- Transformers are **attention models on steroids**. They employ multiple attention layers within both the **encoder and decoder components**.
- This architecture enables **transformers to establish significant contextual understanding across input sentences or images in the encoder**, and **facilitate effective communication from the decoder to the encoder during tasks** such as generating translated sentences or describing images.
- **Transformers take attention to new heights, allowing for enhanced performance and comprehensive learning in a wide range of machine learning applications.**

## 29. MoD signs 250th contract under IDEX

**Subject : Science and Technology**

**Section: Defence**

**Concept :**

- Innovations for Defence Excellence (iDEX) recently reached a milestone with the signing of the 250th contract, the first one under the Mission DefSpace.

**About iDEX (Innovations for Defence Excellence):**

- It is the **flagship initiative of the Ministry of Defence (MoD)**, launched in April 2018.
- **Aim:** To achieve self-reliance and foster innovation and technology development in Defence and Aerospace by engaging Industries including MSMEs, start-ups, individual innovators, R&D institutes and academia.
- iDEX has partnered with leading incubators in the country to provide handholding, technical support and guidance to the winners of iDEX challenges.
- **iDEX will be funded and managed by a ‘Defence Innovation Organization (DIO)’** which has been formed as a ‘not for profit company as per Section 8 of the Companies Act 2013 by the two founder members, i.e. Defence Public Sector Undertakings (DPSUs) – HAL & BEL.
- **iDEX will function as the executive arm of DIO**, carrying out all the required activities, while **DIO will provide high-level policy guidance to iDEX.**
- Under iDEX, **financial support is provided to Start-ups/MSMEs/individual innovators and Partner Incubators through DIO.**
- **Mission DefSpace**
- It was launched by the Prime Minister during DefExpo in October 2022.
- **The goal of Mission DefSpace is to make India Atmanirbhar in defence technologies in the space domain.**
- It will encourage technology development in space for defence applications by startups and young entrepreneurs **through 75 Defence Space Challenges** launched across various Department for Defence Production (DDP) initiatives viz iDEX, ‘Make 1’, and ‘Make 2’.
- **The challenges are classified into five buckets**, viz. Launch System, Satellite System, Communication & Payload System, Ground System and Software System provide a holistic 3600 overview of space.

## 30. To protect India’s bees, we need to understand their impact on agricultural practices

**Subject : Science and Technology**

**Section: Biotech Technology**

**Context:** Farmers worry about effect of genetically modified crops on honey bees.

**More on the News:**

- The **increasing production of genetically modified (GM) crops** has raised concerns about their potential negative impact, especially on pollinators such as bees.
- As honeybee populations decline, **beekeepers in India have united against GM crops**, including the recently approved GM mustard.
- **The decline of honeybees can be an agricultural catastrophe for India**, as crops in 50 million ha across the country depend on pollination by bees.
- **Supreme Court of India is hearing a batch of petitions seeking a ban on commercially cultivating indigenously developed GM mustard.** The central government has, however, stated GM crops are safe for cultivation and not harmful to honeybees.
- GM crops could have direct and indirect impacts on bees. **Direct impacts** can be from the **toxicity of the product of genetic modification.**



- Despite conclusive evidence from studies conducted in other countries that **Bt cotton**, the **sole genetically modified crop cultivated in India**, **does not harm bees directly**, farmers in India remain apprehensive.
- The farmers and beekeepers are more concerned about the **indirect effects** of GM crops. The **timing and length of flowering in GM crops** may pose a significant threat to bees. Some GM crops flower earlier or later than conventional crops, which can **cause a mismatch in when bees need nectar and pollen** and when it is available.
- This mismatch could ultimately **lead to a drop in honey production**, which can lead to **starvation in bee colonies**.

### 31. The new Alzheimer's drug

**Subject: Science and Technology**

**Section: Health**

New clinical trial data released by Eli Lilly on Wednesday has provided the most promising results of any potential Alzheimer's disease treatment yet.

**Concept:**

**Alzheimer's disease**

- **Alzheimer's disease is a brain disorder that slowly destroys memory and thinking skills and, eventually, the ability to carry out the simplest tasks.**
- The disease is named after Dr. Alois Alzheimer
- Its symptoms included memory loss, language problems, and unpredictable behavior.
- In brain found many abnormal clumps (now called amyloid plaques) and tangled bundles of fibers (now called neurofibrillary, or tau, tangles).
- These plaques and tangles in the brain are still considered some of the main features of Alzheimer's disease.
- Another feature is the loss of connections between nerve cells (neurons) in the brain.
- This damage initially takes place in parts of the brain involved in memory, including the entorhinal cortex and hippocampus. It later affects areas in the cerebral cortex, such as those responsible for language, reasoning, and social behavior.

**New Alzheimer's drug:**

- **Donanemab** is a biological drug in **trial to treat early symptoms of Alzheimer's disease**.
- Donanemab was **developed by the company Eli Lilly**
- **Donanemab, also known as N3pG, is an antibody produced in mice that targets an abnormal protein, amyloid beta (Aβ).**
- Whilst the cause of Alzheimer's disease is still unknown, great advances in amyloid pathology have led to a relation between the quantity of Aβ peptides and the development of Alzheimer's disease.
- Aβ peptides are deposited in the brain and when in excess will bind together to create a protein plaque. Donanemab targets this protein plaque, clearing the excess protein which causes a burden in the brain.

**Two new drugs that got approval from US FDA:**

- Two drugs that have received a lot of attention in recent weeks are **aducanumab** (marketed as **Aduhelm**) and
- The drug **Lecanemab**, marketed as **Leqembi**, is the second such **monoclonal antibody** to receive approval from the regulator. (First one is **Aducanemab**.)
- Both drugs showed a **substantial reduction in amyloid in the brain**. But whether this reduction in amyloid resulted in a meaningful benefit in memory and thinking is less clear.
- **Lecanemab** resulted in a **27 per cent slower decline in memory** and thinking ability.

**Concerns:**

Like lecanemab, donanemab carries a high risk of side effects — particularly a set of conditions called amyloid-related imaging abnormalities (ARIA) that can lead to seizures and bleeding in the brain.

Researchers think that by attacking amyloid plaques, the antibodies inadvertently weaken blood vessels in the brain.

### 32. Why spurious liquor kills?

**Subject : Science and technology**

**Section: Health**

**Concept :**

### Science of Creating Alcohol:

- Alcohol is produced using two basic processes: **fermentation and distillation**.
- **Fermentation is a chemical reaction where yeast or bacteria react with the sugars** (from grain, fruits, sugarcane, etc.) to **produce ethanol** (the alcohol in the drink).
- **Liquor is differentiated by its alcohol content from the 5% by volume (beer) to the 12% (wine) to the 40% (distilled spirits)**.
- Distillation is important because with more of the sugar getting converted to alcohol, the conditions become toxic.
- Distillation is the **process of physically separating the alcohol from the rest of the mixture using evaporation and condensation**.

### Adverse effect of Ethanol on Human Health:

- Ethanol ( $C_2H_5OH$ ) is **metabolised in the liver and the stomach by alcohol dehydrogenase (ADH) enzymes** to acetaldehyde.
- Then **aldehyde dehydrogenase (ALDH) enzymes** transform the acetaldehyde into acetate.
- The adverse effects of alcohol consumption, from the hangover to cancer, are due to acetaldehyde.
- Contrary to popular belief, the **World Health Organization (WHO) has found that “no level of alcohol consumption is safe for health”**.
- **What is Hooch/Spurious Liquor?**
- Unlike branded liquor which is produced in factories with sophisticated equipment and rigorous quality control, **hooch is made in more crude settings** (in many cases homemade) **without any quality checks**.
- The **fermented mixture which is to be distilled contains more than just consumable alcohol (ethanol)**.
- It also **contains methanol ( $CH_3OH$ )**, a different form of alcohol which is **highly toxic for human beings**.
- During the distillation, **both ethanol (boiling point of  $78.37^\circ C$ ) and methanol (boiling point of  $64.7^\circ C$ ) are concentrated**.
- The **end product can have a high concentration of methanol** (instead of harmless trace amounts), **which is poisonous and can also cause cerebral edema** (swelling of the brain), **haemorrhage, and death**.
- Importantly, it is **near impossible to tell whether hooch is safe to consume** before actual consumption.

### Regulation of Methanol in India:

- **Schedule I of the Manufacture, Storage and Import of Hazardous Chemical Rules 1989** includes methanol.
- The Food Safety and Standards (Alcoholic Beverages) Regulations 2018 stipulate the maximum permissible quantity of methanol in different liquors.
- For example, these values span a wide range including “absent” in coconut fenny, 50 grams per 100 litres in country liquor, etc.
- The **Indian Standard (IS 517)** applies to how the quality of methanol is to be ascertained, and together with the Tamil Nadu Denatured Spirit, Methyl Alcohol, and Varnish (French Polish) Rules 1959, what signage, methanol packaging should carry

### How can Methanol Poisoning be Treated?

- Once methanol is ingested, the body takes some time to completely eliminate it. There are two immediate ways to treat methanol poisoning.
- **One is to administer ethanol** (of a pharmaceutical grade, by healthcare workers). Ethanol competes with methanol for the ADH enzymes. As a result, the methanol is kept from being metabolised to formaldehyde.
- The other option is to **administer an antidote called fomepizole**, which slows the action of the ADH enzymes, causing the body to produce formaldehyde at a rate that the body can quickly excrete, preventing the deadlier effects from kicking in.

### 33. The first indigenous Vaccine against Dengue

**Subject : Science and technology**

**Section: Biotechnology**

**Concept :**

- Drug makers Serum Institute of India and Panacea Biotec are moving closer to develop the country's first vaccine against dengue.
- They have **applied to the Indian Council of Medical Research's (ICMR) call for ‘Expression of Interest’ for collaborative Phase-III clinical trials** for indigenous manufacturers.

- **Phase-III clinical trial is being done for evaluation of efficacy, along with safety and immunogenicity of tetravalent dengue vaccine.**
- The **desirable characteristics of a dengue vaccine** includes:
  - Acceptable short and long-term safety profile (no antibody dependent enhancement).
  - Inducing protection against all four serotypes of dengue.
  - Reducing risk of severe diseases and deaths.
  - Inducing a sustained immune response and effectiveness irrespective of the earlier sero-status and age of the individual.
- **Risk posed by Dengue:**
  - The global incidence of dengue has grown dramatically with about half of the world's population now at risk.
  - The World Health Organization (WHO) has identified dengue to be one among the top ten global health threats in 2019.
  - As of now, there is no specific treatment for dengue/severe dengue. Therefore, there is an urgent need to develop effective vaccines against dengue viral disease.

### About Dengue

- Dengue is a **vector-borne disease** transmitted by the **bite of an infected female Aedes Aegypti mosquito**.
- This mosquito also **transmits chikungunya, yellow fever and Zika infection**.
- **Aedes aegypti is a daytime feeder**. The peak biting periods are early in the morning and in the evening before dusk.
- There are 4 **serotypes of the virus** that causes dengue. These are known as **DEN-1, DEN-2, DEN-3, DEN-4**.
- The symptoms of the disease will begin anywhere between three to fourteen days after the initial infection.
- The symptoms include:
  - High fever
  - Headache
  - Vomiting
  - Muscle and joint pains
  - Skin Rash
- Diagnosis of dengue infection is done **with a blood test**.
- There is **no vaccine or specific medication for dengue fever**. Patients should seek medical advice, rest and drink plenty of fluids.
- **Dengue cannot be spread directly from person to person**. However, a **person infected and suffering from dengue fever can infect other mosquitoes**.
- Most cases occur in tropical areas of the world, including the Indian subcontinent, Southeast Asia, Southern China, Taiwan, the Pacific Islands, the Caribbean, Mexico, Africa, Central and South America.
- WHO estimates 39 crore dengue virus infections per year, of which 9.6 crore show symptoms.

### 34. ASTR: How govt's AI and face recognition tool will detect phone frauds

#### **Subject : Science and Technology**

#### **Section: Awareness in IT and Computers**

**Context:** The DoT claims the tool — called Artificial Intelligence and Facial Recognition powered Solution for Telecom SIM Subscriber Verification (ASTR) — can potentially bring down cyber frauds by detecting and blocking possible fraudulent mobile connections

#### **What is ASTR?**

- Its acronym is '**Artificial Intelligence and Facial Recognition Powered Solution for Telecom Sim Subscriber Verification – ASTR**
- Created specifically **to address problems of SIM-card fraud**
- ASTR was **conceptualised and implemented by the Department of Telecommunications (DoT) Haryana LSA unit** "to carry out 100% mobile subscriber verification".

#### **How does it work?**

- The system uses subscriber images provided by **the Telecom Subscriber Providers (TSPs) and compares the same to groups of similar images using facial recognition**.
- It also compares other details available in the database to confirm any cases of forged documents or duplication of SIM card registrations under different names, guardian name, date of birth or any other KYC parameter

- It runs **all subscriber images** through ASTR's facial recognition mechanism until you get a match
- It Use **fuzzy logic** for finding a unique set of names (fuzzy logic is a science of approximate string matching).
- Using this, authorities can identify two entries that are approximately similar and so find a set of subscriber names
- ASTR conducts **unique mapping of the subscriber image with names**
- ASTR comes across individual subscribers that have over nine SIMs in their name because the **DoT allows an individual to take nine legitimate mobile phone connections using a single identity proof.**

### Success using ASTR

- In first phase, analysis of more than 87 crore mobile connections was carried out.
- For such a large data processing, **Param-Sidhhi Supercomputer was used.**
- Multiple cases were detected where one photograph was used to obtain hundreds of connections.
- A total of 40.87 Lakh suspected mobile connections were detected.
- After due verification 36.61 Lakh connections have already been disconnected. Remaining are under process.
- 40,123 Point of Sales (PoS) involved in selling such mobile connections, have been blacklisted by the service providers and more than 150 FIRs have been lodged across India.
- The details of disconnected numbers have been shared with banks, payment wallets and social media platforms for disengaging these numbers with their accounts.
- **Related Information:**
- **Sanchar Saathi portal:**
- It is a **citizen centric initiative of Department of Telecommunications** to empower mobile subscribers, strengthen their security and increase awareness about citizen centric initiatives of the Government
- It empowers citizens by allowing them to **know the mobile connections issued in their name, get disconnected the connections not required by them, block/trace lost mobile phones and check genuineness of devices while buying a new/old mobile phone.**

### 35. Investment towards 4G almost over: Airtel

#### **Subject : Science and Technology**

#### **Section: Awareness in IT**

#### Evolution from First Generation to Fifth Generation

- 1G was launched in the 1980s and worked on analog radio signals and supported only voice calls.
- 2G was Launched in the 1990s which uses digital radio signals and supported both voice and data transmission with a Bandwidth of 64 Kbps.
- 3G was launched in the 2000s with a speed of 1 Mbps to 2 Mbps and it has the ability to transmit telephone signal including digitised voice, video calls and conferencing.
- 4G was launched in 2009 with a peak speed of 100 Mbps to 1 Gbps and it also enables 3D virtual reality.

#### **5G**

- 5G or fifth generation is the latest upgrade in the long term evolution (LTE) mobile broadband networks.
- The first generation of networks allowed only mobile voice calls to be made, while the second generation allowed mobile voice calls as well as sending of short text messages.
- It was the third generation or 3G network which allowed web browsing on mobile devices, the speed and latency of which improved with fourth-generation or 4G networks.
- The 5G networks will have even faster speeds with latency down to between 1-10 milliseconds.
- Note: Latency is the time a device takes to communicate with the network, which stands at an average of up to 50 milliseconds for 4G networks across the world.

#### **How does 5G work?**

- All 5G networks chiefly operate on three spectrum bands.
- The low-band spectrum has been proven to have great coverage and works fast even in underground conditions. However, the maximum speed limit on this band is 100 Mbps (Megabits per second).
- In the mid-band spectrum, though the speeds are higher, telcos across the world have registered limitations when it comes to coverage area and penetration of telephone signals into buildings.
- The high-band spectrum offers the highest speed but has extremely limited network coverage area and penetration capabilities.

- The telcos using this band rely on the existing LTE networks and will need to install a number of smaller towers to ensure adequate coverage and high-speed performance.

#### Where does India stand on the deployment of 5G?

- Companies, both telecom service providers and their equipment vendors, have completed lab trials of 5G network components but are yet to commence field trials, which were initially scheduled to happen last year.
- For the same, telecom companies are awaiting allocation of test spectrum from the Department of Telecommunications (DoT).
- The service providers have already tied up with equipment makers like Nokia, Ericsson, etc for deploying their 5G networks

### 36. Centre pushes vaccine for lumpy skin disease

**Subject : Science and technology**

**Section: Health**

**Concept :**

- More than 10,000 cattle have been infected with the Lumpy Skin disease in this wave of the epidemic.
- **Uttarakhand has reported the bulk of the cases in this wave.** While the **Kutch region of Gujarat emerged as the epicenter of the Lumpy Skin disease** outbreak last year.
- Government launched a massive vaccination drive to control the epidemic in cattle.
- About nine crore cattle have been vaccinated so far, and the recovery rate is above 94%.

#### **Lumpy Skin Disease**

- LSD is caused by infection of cattle or water buffalo with the **Capri poxvirus Lumpy Skin Disease Virus (LSDV).**
- It is **genetically related to the goatpox and sheeppox** virus family.
- Lumpy skin disease was first seen as an epidemic in Zambia in 1929. Initially, it was thought to be the result of either poisoning or hypersensitivity to insect bites.
- According to the Food and Agriculture Organization (FAO), the mortality rate is less than 10%.
- **Transmission:**
- Lumpy skin disease is primarily spread between animals by biting insects (vectors), such as mosquitoes and biting flies.
- **Symptoms:**
- It primarily consists of fever, fluid excretion from eyes and nose, dribbling of saliva from the mouth and blisters on the body.
- The animal stops eating and faces problems while chewing or eating, resulting in reduced milk production.
- **Prevention and Treatment:**
- **Vaccination against these diseases** is covered under the **Livestock Health and Disease Control Programme of India.**
- There are **no specific antiviral drugs available for the treatment** of lumpy skin disease. The only treatment available is supportive care of cattle. This can include treatment of skin lesions using wound care sprays and the use of antibiotics to prevent secondary skin infections and pneumonia.
- **Anti-inflammatory painkillers** can be used to keep up the appetite of affected animals.
- **Lumpi-ProVacInd :**
- **Lumpi-ProVacInd is a live attenuated vaccine** developed jointly by ICAR's National Research Centre on Equines and the Indian Veterinary Research Institute, which is targeted to **protect cattle against the LSD virus, and provides 100% protection.**

### 37. Block-chain enabled trace and track system

**Subject :Science and technology**

**Section: Awareness in IT**

This is a supply chain centered implementation of the block-chain technology, that uses the **decentralized, immutability (cannot be changed), real-time, cryptographic security** characteristics of the distributed ledger system (i.e. Block Chain) to stream-line supply chains.

With this one can track where the inventory is at a moment, from where it was sourced, and help verify the genuineness of the product. At present this is a challenge for traditional supply chain management because of being: paper based, disjointed data systems, compatibility issues, visibility gaps, counterfeit products.



With block-chain, supply chain companies can document production updates to a single shared ledger, which provides complete data visibility and a single source of truth. Because transactions are always time-stamped and up to date, companies can query a product's status and location at any point in time. This helps to combat issues like counterfeit goods, compliance violations, delays, and waste.



#### Use cases:

- Food and Agriculture: respond quickly in the event of food safety emergencies, empower customers by providing detailed food supply chain insights. Compensate small farmers quickly and equitably.
- Pharmaceuticals: Reduce counterfeit medicines.
- Manufacturing: demonstrate authenticity and ethical practices. Track spare auto parts and streamline auto safety recall processes
- Mining: Ensure ethical sourcing and authenticity of raw materials. Accurately track environmental impacts of production, revealing new opportunities for sustainability.

### 38. Novel host-directed molecules blunt SARS-CoV-2, influenza virus

**Subject :Science and Technology**

#### Section: Bio Technology

**Context:** Virus can develop resistance against antivirals, while drugs that target the host cells to prevent virus infection can remain effective even when the virus evolves.

#### More on the News:

- Indian researchers have, for the first time, been able to **synthesise small molecules that can effectively halt the infection of cells** by SARS-CoV-2 and influenza viruses by targeting the hosts.
- In place of **antivirals that directly target the virus** in question, the team, co-led by researchers at IISER Mohali and IIT Ropar, attempted the host-directed therapy. Till date, no approved host-directed drugs are available for either SARS-CoV-2 or influenza virus.
- In both cultured cells and animal studies, the small molecules that were synthesised by team at the Department of Chemistry, IIT Ropar showed over **95% efficacy** in halting the infection of cells by SARS-CoV-2 and influenza viruses.
- While **antivirals that target the virus become ineffective once the virus develops resistance, drugs that target the host cells** to prevent the virus from infecting them, are expected to **remain effective even when the virus evolves** by accumulating mutations.
- There is already evidence that the **current FDA-approved drugs for treating SARS-CoV-2 and influenza virus infection are losing their efficacy due to the emergence of drug-resistant virus strains**. In host-directed therapy, the challenge is that molecules can very often turn out to be toxic to the host cells, the reason why this approach has not been widely adopted.

- The small molecules were not only effective (over 95%) against both SARS-CoV-2 and influenza viruses, they were not toxic to either cultured cells or mice even after prolonged exposure.
- Of the 28 molecules screened, one molecule—1,3-diphenylurea derivative (DPUD) was able to block both SARS-CoV-2 and influenza virus infection by almost 100% in cells without being toxic to the cells.
- These molecules **carry chloride ions into the cell**, thereby **leading to a large accumulation of chloride inside the cell**, disturbing the chloride equilibrium. When the chloride equilibrium is disturbed, some endocytic pathways become non-functional. As a result, the viruses fail to enter the cells and establish infection.
- The **small molecules were found to be highly effective** when tested against H1N1 and H3N2 influenza virus sub-types and the SARS-CoV-2 Wuhan, Delta, and two Omicron variants of concern.

### 39. Calcium 41 in radiometric dating

**Subject: Science and technology**

**Section: Nuclear technology**

**Concept :**

- Recent study shows that Calcium-41 can be used the same way as Carbon-14 in carbon dating, but with several advantages.

#### **Radio Carbon Dating**

- **Carbon-14 – Radiocarbon (Carbon 14)** is an **isotope of the element carbon** that is unstable and weakly radioactive [The stable isotopes are carbon 12 and carbon 13]
- It has a **half-life of 5,700 years**, so the **technique can't determine the age of objects older than around 50,000 years**.
- **Radiocarbon dating** – It is a method that provides objective age estimates for carbon-based materials that originated from living organisms.
- **Plants and animals assimilate Carbon 14 from carbon dioxide throughout their lifetimes.**
- When they die, they stop exchanging carbon with the biosphere and their carbon 14 content then starts to decrease at a rate determined by the law of radioactive decay.
- An age could be estimated by measuring the amount of carbon-14 present in the sample.
- There are 3 principal techniques used to measure carbon 14 content of any given sample.
- Gas proportional counting
- Liquid scintillation counting
- Accelerator mass spectrometry (Advanced method)
- The method was developed 1940s by Willard Libby, who received the Nobel Prize in Chemistry to this work in 1960.
- The issue with carbon dating was to detect carbon-14 atoms, which occur once in around 10<sup>12</sup> carbon atoms.

#### **Calcium-41**

- Calcium-41 is a **rare long-lived radio-isotope of Calcium** that has a **half-life of 99,400 years**.
- **Calcium-41 is called a cosmogenic nuclide**, because it is **produced when cosmic rays from space smash into calcium atoms in the soil in a fission reaction, called spallation**.
- It is **found in the earth's crust, opening the door to dating fossilized bones and rock**.
- The **issue is Calcium-41 is rarer, occurring once in around 10<sup>15</sup> Calcium atoms**.

#### **How can the issue of detecting C-14 and CA-41 be resolved?**

- **Atom Trap Trace Analysis (ATTA)** – Researchers at the University of Science and Technology of China pitched a technique called atom-trap trace analysis (ATTA) to spot these atoms.
- ATTA is both **extremely sensitive and selective**, and is based on the laser manipulation and detection of neutral atoms.
- **Procedure** –
- A sample is vaporised in an oven.
- The atoms in the vapour are laser-cooled and loaded into a cage made of light and magnetic fields.
- In ATTA, a laser's frequency is tuned such that it imparts the same energy as required for an electron transition in Calcium-41.
- The electrons absorb and release this energy, revealing the presence of their atoms.
- **Significance** –
- It can spot one calcium-41 atom in every 10<sup>16</sup> calcium atoms with 12% precision in seawater.

- ATTA also avoids potassium-41 atoms, which are similar to calcium-41 atoms but lack the same electron transition.
- It can also be modified to study isotopes of some noble gases that have defied techniques developed for carbon-14, such as argon-39, krypton-81, and krypton-85.

#### What are the applications of ATTA and Calcium-41?

- Opens the possibility of extension to other metal isotopes
- To study how long rocks has been covered by ice
- Open avenues for exploring Earth-science applications.

#### 40. Understanding a Human Pan-genome Map

**Subject : Science and technology**

**Section: Biotechnology**

**Concept :**

- A new study published in the journal Nature describes a pangenome reference map created utilising genomes from 47 anonymous individuals (19 men and 28 women), mostly from Africa but also from the Caribbean, Americas, East Asia, and Europe.

**Genome**

- The genome is the **blueprint of life, a collection of all the genes** and regions between the genes contained in our 23 pairs of chromosomes.
- **Each chromosome is a contiguous stretch of DNA** string composed of millions of individual building blocks called nucleotides or bases.
- **Genome sequencing is the method used to determine the precise order of the four letters and how they are arranged in chromosomes.**
- Sequencing individual genomes helps us understand human diversity at the genetic level and how prone we are to certain diseases.
- To circumvent this, one can have a collective identity card, such as a single genome identity card for everyone living in a region.

**Reference genome**

- The making of the first reference genome in 2001 was a scientific breakthrough, helping scientists discover **thousands of genes linked to various diseases and design novel diagnostic tests.**
- However, the **reference genome was 92% complete and contained many gaps and errors.**
- Since then, the reference genome map has been refined and improved to have complete end-to-end sequences of all 23 human chromosomes.
- However, the **finished reference genome map does not represent all of human diversity.**
- This new study published in Nature changes this, describing the making of the pangenome map, the genetic diversity among the 47 individuals, and the computational methods developed to build the map and represent differences in those genomes.

**Pangenome map**

- The **pangenome is a graph of each chromosome, with nodes where sequences of all 47 individuals converge and internodes representing genetic variations.**
- To create **complete and contiguous chromosome maps**, researchers used long-read DNA sequencing technologies, which produce strings of contiguous DNA strands of tens of thousands of nucleotides long.
- This helps assemble the sequences with minimum errors and read through repetitive regions of the chromosomes.

**Why is a pangenome map important?**

- The human genome consists of 3.2 billion individual nucleotides, with a 0.4% difference between any two individuals.
- A complete and error-free pangenome map will help us understand these differences and explain human diversity better.
- It has added nearly 119 million new letters and aided the discovery of 150 new genes linked to autism.
- Future pangenome maps that include high quality genomes from Indians will shed light on disease prevalence, help discover new genes for rare diseases, design better diagnostic methods, and help discover novel drugs.

#### 41. COVID-19 genomics body INSACOG has not put out weekly bulletin since March 27

**Subject : Science and Technology**

**Section: Biotechnology**

**Why in news?**

The India SARS-CoV-2 Genomics Consortium (INSACOG), a multi-laboratory, multi-agency, pan-India network tasked with sequencing, and keeping an eye out for new, threatening SARS-CoV-2 variants, has not published a single bulletin since March 27.

**INSACOG COVID -19 Bulletins:**

- Earlier, the agency would publish reports once a week. Bulletins provided information on the circulating variants of COVID-19, States that were seeing a surge in the contagious variants and information on whether SARS-CoV-2 variants linked to major outbreaks internationally had been found in India.
- December 2022 saw four bulletins on the 5th, 12th, 19th and 26th of the month, January 2023 saw bulletins on the 2nd and 9th, February saw no bulletins while March had bulletin releases on the 13th, 20th and the last on the 27th of the month. April and May (so far) had no bulletins for the public.

**Why no Bulletin?**

Genome sequencing had dipped because fewer samples were being made available to network-labs from hospitals and medical colleges for sequencing (as reported cases were declining).

**Why it is important?**

The World Health Organisation (WHO) has warned that countries should not look away from COVID-19 and on May 20, launched a global network to help protect people from infectious disease threats through the power of pathogen genomics.

The **International Pathogen Surveillance Network (IPSN)** will provide a platform to connect countries and regions, improving systems for collecting and analysing samples, using these data to drive public health decision-making, and sharing that information more broadly.

**ISACOG:**

- INSACOG is a joint programme initiated by the **Union Health Ministry of Health** and the **Department of Biotechnology** with the **Council for Scientific and Industrial Research (CSIR)** and the **Indian Council of Medical Research (ICMR)**. It is a consortium of 54 laboratories to monitor the genomic variations in SARS-CoV-2.
- The central government set up a consortium of 10 national research institutions, which will collaborate for carrying out effective surveillance and monitoring of the genomic variations observed in the new SARS nCov-2 virus strain, recently identified from the United Kingdom.
- Indian SARS CoV2 Genome Sequencing Consortium (INSACOG), it will be a platform for scientists, virologists, experts studying diseases and government officials to interact and track the genomic variations of the novel coronavirus.
- INSACOG will have a high level Inter-Ministerial Steering Committee.
- It will have a Scientific Advisory Group for scientific and technical guidance.
- It will monitor the genomic variations in the SARS-CoV-2 on a regular basis through a multi-laboratory network.
- This vital research consortium will also assist in developing potential vaccines in the future.
- The consortium will also establish a sentinel surveillance for early detection of genomic variants with public health implication, and determine the genomic variants in the unusual events/trends (super-spreader events, high mortality/morbidity trend areas etc.).

#### 42. India set to triple speed of its fastest supercomputers

**Subject : Science and technology**

**Section: Art and Culture**

**Concept :**

- According to the Ministry of Earth Sciences (MoES), India is set to dramatically scale up its super-computing prowess and install an 18-petaflop system over the course of this year.

**Key highlights:**

- The most important details are that **India's most powerful supercomputers, Pratyush and Mihir, with a combined capacity of 8 petaflops**, are housed at the **Indian Institute of Tropical Meteorology (IITM)** and the **National Centre for Medium Range Weather Forecasting (NCMRWF)**.
- These supercomputers were made operational in 2018 at an investment of 438 crore and will be housed at the IITM and NCMRWF.

#### **Imported from France**

- The Government of India has **signed a deal with France to procure high-performance computers worth 4,500 crore by 2025**.
- The new earth-sciences Ministry computers are likely to cost 900 crore and will improve resolution to 6\*6 km, meaning four times as many pixels can be used to represent a given area.
- The fastest high-performance computing system in the world is currently the Frontier-Cray system at Oakridge National Laboratory, with a **peak speed of 1 exa-flop**.
- The **top 10 other systems range from 400 petaflops to 60 petaflops**.

#### **About National Supercomputing Mission (NSM)**

- The four major pillars of the NSM, namely, **Infrastructure, Applications, R&D, HRD**, have been functioning efficiently to realize the goal of developing indigenous supercomputing eco system of the nation.
- Some of the large-scale applications which are being developed under NSM include the following,
  - Climate Modelling
  - Weather Prediction
  - Aerospace Engineering including CFD, CSM, CEM
  - Computational Biology
  - Molecular Dynamics
  - Atomic Energy Simulations
  - National Security/ Defence Applications
  - Seismic Analysis
  - Disaster Simulations and Management
  - Computational Chemistry
  - Computational Material Science and Nano-materials
  - Discoveries beyond Earth (Astrophysics)
  - Large Complex Systems Simulations and Cyber Physical Systems
  - Big Data Analytics
  - Finance
- Information repositories/ Government Information Systems Being steered jointly by: **Ministry of Electronics & Information Technology (MeiTY) and the Department of Science and Technology (DST)**
- Being implemented by: **Centre for Development of Advanced Computing (C-DAC) and Indian Institute of Science (IISc), Bangalore.**

#### **43. Floating point operations system (FLOPs) and Supercomputers**

**Subject : Science and Technology**

**Section:**

**Context**

- India will unveil its 18 new supercomputers for weather forecasting institutes later this year. The new supercomputer is expected to improve weather forecasts at the block level, help weather scientists give higher resolution ranges of the forecast, predict cyclones with more accuracy and better lead time, and provide ocean states forecasts, including marine quality forecasts.
- The new will improve forecasts from 12 km resolution to 6 km resolution.

#### **What are FLOPs?**

- FLOPs is a metric used for measurement of computational performance -processing power and efficiency, especially in the field of high performance computing (HPC) and Artificial intelligence (AI). Floating point operations are a certain kind of mathematical calculation using real numbers and fractional parts. FLOPs are not only a metric for computational performance but Memory bandwidth ,latency are also crucial factors. Nevertheless, FLOPs act as a baseline to judge performance where calculations dominate.

#### **Current Supercomputers of India and world**

- Currently ,the World' fastest supercomputer in terms of Petaflops is Hewlett Packard's Enterprise frontier ,or OCLF-5,with the peak performance of 1685.65 petaflops.



- In India NCMRWF(National centre for medium range weather forecasting) houses ‘Mihir’, a 2.8 petaflops supercomputer and ‘Pratyush’ 4.0 petaflops supercomputer at Indian Institute of Tropical Meteorology(IITM) at Pune. Out of 18 new supercomputers 10 will be installed at NCMRWF at Noida and 8 at IITM ,Pune.

#### 44. XPoSAT

**Subject :Science and Technology**

**Section: Space technology**

**Context :**

- The Indian Space Research Organisation is collaborating with the Raman Research Institutes, Bengaluru ,to build the **X-ray polarimeter satellite(XPoSAT)**, which is scheduled to be launched later this year.

**What is XPoSAT mission**

- According to **ISRO**,”**XPoSAT** will study various dynamics of bright astronomical X-ray sources in extreme conditions”. It has been billed as India’s first, and only the world’s second polarimetry mission after that of NASA’S imaging X-ray Polarimetry Explorer(IXPE) that was launched in 2021.

**How it works**

- Various celestial bodies like neutron star, Black Holes emit X-ray as low as 0.3 nm, certain wavelengths in its spectrum are polarised light(which vibrate in one plane).The field of Polarimetry helps us by measuring the angle of rotation of the plane of polarised light. Since these are very complex to study by normal space observatory, X-ray Polarimeter is used.

**Payloads**

- The spacecraft will carry two scientific payloads in a low earth orbit. The primary payload POLIX (Polarimeter Instrument in X-rays) will measure the polarimetry parameters (degree and angle of polarisation. POLIX is expected to observe about 40 bright astronomical sources of different categories during the planned lifetime of XPoSat mission of about 5 years. This is the first payload in the medium X-ray energy band dedicated for polarimetry measurements.
- The secondary payload XSPECT(X-ray Spectroscopy and timing) will give spectroscopic information of how light is emitted and absorbed by objects in space. It would observe several types of sources, such as X-ray pulsars, black hole binaries, low -magnetic field ,neutron star etc

#### 45. Gravitational Waves

**Subject : Science and technology**

**Section: Space technology**

**Concept :**

- The collaboration between LIGO, Virgo, and KAGRA is crucial for unraveling the mysteries of gravitational waves. These detectors work together to decipher the subtle disturbances in spacetime caused by massive celestial objects.

**LIGO Historic Breakthrough Continues:**

- After a hiatus, LIGO has recently resumed its operations following a significant upgrade.
- The upgraded version is approximately 40% more sensitive than its predecessor, enabling it to detect fainter and more distant gravitational waves.
- The latest observation run commenced on April 1, 2023, and is expected to span approximately two years.
- During this period, LIGO will actively search for gravitational waves generated by phenomena such as black hole mergers, neutron star collisions, and supernovae.

**Collaboration between LIGO, Virgo, and KAGRA**

- The collaboration between LIGO, Virgo, and KAGRA is crucial for unraveling the mysteries of gravitational waves.
- These detectors work together to decipher the subtle disturbances in spacetime caused by massive celestial objects.
- To enhance the sensitivity of the instruments, additional vacuum pipes with mirrors have been constructed as part of the upgrade. These vacuum pipes reduce noise and minimize mirror jitter, enabling more precise measurements.
- While Virgo experienced delays in restarting due to technical issues, KAGRA has resumed its operations on May 24.

- KAGRA will join LIGO's ongoing experimental run before undergoing further commissioning in the following month. Looking ahead, LIGO-Virgo-KAGRA is anticipated to be joined by LIGO-India later in the decade, with some components of LIGO-India being constructed using spare parts from the original LIGO project.
- This collaborative effort demonstrates the continuous advancements in gravitational-wave research and the promising future discoveries it holds.

#### **VIRGO:**

- Virgo is located near Pisa in Italy. The Virgo Collaboration is currently composed of approximately 650 members from 119 institutions in 14 different countries including Belgium, France, Germany, Hungary, Italy, the Netherlands, Poland, and Spain.

#### **KAGRA:**

- The **Kamioka Gravitational Wave Detector (KAGRA)**: The KAGRA detector is located in Kamioka, Gifu, Japan. The host institute is the Institute of Cosmic Ray Researches (ICRR) at the University of Tokyo.
- This interferometer is underground and uses cryogenic mirrors. It has 3 km arms.

#### **Concept:**

#### **LIGO**

- The LIGO Scientific Collaboration (LSC) is a group of scientists **focused on the direct detection of gravitational waves**, using them to **explore the fundamental physics of gravity**, and developing the **emerging field of gravitational wave science as a tool of astronomical discovery**.
- The LSC works toward this goal through research on, and development of techniques for, gravitational wave detection; and the development, commissioning and exploitation of gravitational wave detectors.
- The project operates **three gravitational-wave (GW) detectors**. Two are at Hanford, Washington, north-western US, and one is at Livingston in Louisiana, south-eastern US.
- The proposed **LIGO India project aims to move one advanced LIGO detector from Hanford to India**.

#### **VIRGO**

- Virgo is a **giant laser interferometer designed to detect gravitational waves**.
- Virgo has been designed and built by a collaboration of the French Centre National de la Recherche Scientifique (CNRS) and the Italian Istituto Nazionale di Fisica Nucleare (INFN)
- It is now operated and improved in Cascina, a small town near Pisa on the site of the European Gravitational Observatory (EGO), by an international collaboration of scientists from France, Italy, the Netherlands, Poland, and Hungary.

#### **Working:**

- It consists of two 3-kilometre-long arms, which house the various machinery required to form a laser interferometer.
- A **beam-splitter divides a laser beam into two equal components**, which are subsequently sent into the two interferometer arms.
- In each arm, a two-mirror Fabry-Perot resonant cavity extends the optical length. This is **because of multiple reflections that occur within each cavity and which consequently amplify the tiny distance variation caused by a gravitational wave**.
- The two beams of laser light that return from the two arms are recombined out of phase so that, in principle, no light reaches the so-called 'dark fringe' of the detector. **Any variation caused by an alteration in the**

distance between the mirrors produces a very small shift in phase between the beams and, thus, a **variation of the intensity of the light**, which is proportional to the wave's amplitude.

### **Black hole**

- Black holes are **imploded stars** that keep its mass and gravity. The black holes are **infinitely small with no real shape**, and can suck in everything that is a certain distance away.
- It **exhibits strong gravitational effects**, due to which, particles and electromagnetic radiation cannot escape from it.
- It acts like an ideal black body reflecting no light. It continues to grow, by absorbing mass from its surroundings.

### **Black hole merger**

- Gravitational waves, postulated by Albert Einstein 100 years ago but discovered only in 2015 do not produce any sound on their own.
- These are just ripples created in the fabric of space-time by moving celestial objects just like a moving boat produces ripples in water.
- But when converted into audio signals, these can produce signature sounds that can reveal the origin of the gravitational waves.
- The gravitational wave detected on September 14, 2015, is now known to **have been produced by the merger of two black holes about 1.3 billion years ago**.
- Scientists already knew the kind of sound that gravitational waves emanating from such events were likely to produce.
- As two such dense and massive objects, black holes or neutron stars, are about to merge, **they start rotating around each other at almost the speed of light**. The merger takes place within a fraction of a second.
- The **gravitational waves released in this last bit, when converted into audio signals, produce sound that is within audible range of human beings**.

## **46. Iron fortification: risks of excessive iron intake**

**Subject: Science and Technology**

**Section: Species in news**

**Context:**

In India close to half the population of women and children suffer from iron deficiency, to address this government is mulling fortification of wheat, rice or salt with iron.

### **Why it won't help much**

The net benefit of Iron fortification on haemoglobin formation is likely to be lower than thought. Excess iron in fortified diet will remain unabsorbed. Only about 5-10 percent of the ingested iron is absorbed.

### **Associated risks**

While women can excrete iron from the body through menstrual bleeding, men cannot. This makes men particularly vulnerable to excess iron intake. Unabsorbed iron can lead to inflammation in the gastrointestinal lining and disrupt the colonic microbiota. Excess iron has been closely linked to diabetes. Abnormal fat oxidation due to excess iron causes excessive accumulation of triglycerides in muscle and liver tissues. In very high amounts, iron can cause liver fibrosis, with subsequent progression to liver cirrhosis.

### **Way forward**

It is imperative to develop individualised strategies and ensure thorough monitoring to detect any adverse events at the earliest. There is no doubt that some segments of the population do need extra iron in their diet but not all. Eventually,

precision in public health is essential if we are to avoid the risk of iron overload and the potential for long-term chronic illnesses.

#### 47. New Jupiter-size exoplanet discovered

**Subject : Science and technology**

**Section: Space technology**

**Concept :**

- An international team of scientists led by Prof. Abhijit Chakraborty at the Exoplanet Research Group of the Physical Research Laboratory (PRL), Ahmedabad has discovered a new Jupiter-sized exoplanet.

**About the exoplanet**

- A new Jupiter-sized exoplanet with the highest density of  $\sim 14 \text{ g/cm}^3$  known to date has been discovered.
- The new exoplanet discovered has a mass that is 13 times that of Jupiter.
- This discovery was made using the indigenously developed **PRL Advanced Radial-velocity Abu-sky Search spectrograph (PARAS)** and **PRL2m telescope at Gurushikhar Observatory located in Mt. Abu.**
- The team of scientists involved in the discovery includes researchers from India, Germany, Switzerland and the US.
- The **new exoplanet discovered** was found around the **star called TOI4603 or HD 245134.**
- This newly discovered exoplanet “**TOI 4603b**” is regarded as one of the most massive and densest giant planets that orbits very close to its host star at a distance less than 1/10th the distance between our Sun and Earth.
- This newly discovered planet falls into the transition mass **range of massive giant planets and low-mass brown dwarfs.**
- **Massive giant exoplanets** are those having mass greater than four times that of Jupiter.
- **Low-mass brown dwarfs** are those having mass equal to 13 times the mass of Jupiter.
- The exoplanet with a surface temperature of 1670 K is said to be undergoing high-eccentricity tidal migration with an eccentricity value of approximately 0.3.
- The discovery also marks the third exoplanet discovery by India, and by the PRL scientists using PARAS spectrograph and the PRL 1.2m telescope, following the discoveries of K2-236b (in 2018) and TOI-1789b (in 2021).
- The finding of such exoplanets provides valuable information about the formation, migration, and evolution mechanisms of massive exoplanets.

#### 48. Shenzhou-16 Mission

**Subject : Science and technology**

**Section: Space Technology**

**Concept :**

- China sent its first civilian astronaut into orbit, as it launched the Shenzhou-16 mission to its Tiangong space station.

**Shenzhou 16**

- Shenzhou 16 is a Chinese spaceflight to the Tiangong space station, launched on 30 May 2023 on board a Shenzhou spacecraft.
- It carries two People's Liberation Army Astronaut Corps (PLAAC) taikonauts and a payload specialist from Beihang University.
- The mission is the eleventh crewed and sixteenth flight overall of the Shenzhou program.

**Tiangong space station**

- **Tiangong space station** which translates as “Heavenly Palace” is China's permanent space station.
- China had previously launched two temporary trial space stations, named as Tiangong-1 and Tiangong-2.
- The Tiangong space station has three modules namely:
- **Tianhe:** the core module launched in 2021
- **Wentian:** science module 1, launched in 2022
- **Mengtian:** science module 2, also launched in 2022
- Tiangong space station is planned in such a way that it shares its orbit with the Xuntian space telescope in order to facilitate astronauts to repair and upgrade the telescope easily.

- China became only the third country in history to have put both astronauts into space and to build a space station, after the Soviet Union and the US.
- **China believes that Tiangong will replace the International Space Station (ISS), which is due to be decommissioned in 2031.**

#### 49. The Foucault's Pendulum

**Subject : Science and technology**

**Section: Msc**

**Concept :**

- The Foucault's Pendulum has been installed hanging from a skylight at the top of the Constitution Hall in the newly inaugurated Parliament.
- Suspended from the ceiling of the Central Foyer of India's new Parliament building, inaugurated is a Foucault pendulum.

#### **Foucault's Pendulum**

- The **Foucault's Pendulum** was named after French physicist Léon Foucault who invented it in the mid-19th Century.
- Foucault in 1851 built the first-of-its-kind pendulum comprising a 28-kilo iron ball and a 67-metre steel wire.
- Foucault hung the pendulum inside France's Panthéon and then pushed it to one side and released it – after which it began swinging back and forth.
- Though the pendulum swings back and forth the Earth rotates beneath it. This means relative motion is at play.
- At the North Pole, latitude 90° N, the relative motion as viewed from above in the plane of the pendulum's suspension is a counter clockwise rotation of the Earth once approximately every 24 hours (more precisely, once every 23 hours 56 minutes 4 seconds, the length of a sidereal day). Correspondingly, the plane of the pendulum as viewed from above appears to rotate in a clockwise direction once a day.
- A Foucault pendulum **always rotates clockwise in the Northern Hemisphere** with a **rate that becomes slower as the pendulum's location approaches the Equator.**
- Foucault's original pendulums at Paris **rotated clockwise at a rate of more than 11° per hour, or with a period of about 32 hours per complete rotation.**
- The **rate of rotation depends on the latitude.**
- At the Equator, 0° latitude, **a Foucault pendulum does not rotate.**
- In the **Southern Hemisphere, rotation is counter-clockwise.**
- In short, as the Earth rotates on its axis the pendulum changes the direction it swings in.

#### **The pendulum inside the new Parliament**

- Created by the National Council of Science Museum (NCSM) in Kolkata, the pendulum is being dubbed as the largest such piece in India, 22 metre in height, and weighing a staggering 36 kg.
- The piece has been crafted with gunmetal and affixed with an electromagnetic coil to ensure hassle-free movement.
- It touches the floor as it rotates on its axis. The pendulum hangs from a skylight at the top of the Constitution Hall, and signifies the “integration of the idea of India with the idea of the cosmos.”
- At the latitude of the Parliament, it takes 49 hours, 59 minutes, and 18 seconds for the pendulum to complete one rotation, as per the details displayed at the installation.

#### 50. Testing breakthrough challenges 'world's worst wildlife disease'

**Subject : Science and technology**

**Section: Health**

**Concept :**

- For the past 40 years, a devastating fungal disease has been ravaging frog populations around the world, wiping out 90 species. A multinational study has now developed a method to detect all known strains of this disease, caused by the **amphibian chytrid fungus.**

#### **The Panzootic**

- Unlike the global COVID-19 pandemic, you may not even be aware of this “panzootic” – a pandemic in the animal world. Yet it's the **world's worst wildlife disease.**



- A **panzootic** is an epizootic (an outbreak of an infectious disease of animals) that spreads across a large region (for example a continent), or even worldwide. The equivalent in human populations is called a pandemic.
- A **panzootic can start when three conditions have been met:**
  - the emergence of a disease new to the population.
  - the agent infects a species and causes serious illness.
  - the agent spreads easily and sustainably among animals.

### **Chytridiomycosis: The deadly frog disease**

- Chytridiomycosis, also known as **chytrid**, is a **fungal disease** that has been decimating frog populations worldwide for the past 40 years.
- The disease has caused severe declines in over 500 frog species and led to 90 extinctions, making it the deadliest animal disease known.

### **How does it infect?**

- **Chytrid infects frogs by reproducing in their skin**, damaging their ability to balance water and salt levels.
- The disease originated in Asia and spread globally through amphibian trade and travel.

### **An extreme mortality rates**

- The extreme rate of mortality, and the high number of species affected, makes chytrid unequivocally the deadliest animal disease known to date.
- The **single-celled fungus** enters a skin cell, multiplies, then breaks back out onto the surface of the animal.
- This damage to the skin affects the frog's ability to balance water and salt levels, and eventually leads to death if infection levels are high enough.
- It's believed that global travel and trade in amphibians led to the disease being unwittingly spread to other continents like Asia.

### **Natural immunity**

- The most puzzling thing about chytrid is that some amphibian species – even those that have not evolved with the pathogen – **don't become sick when they carry the fungus**. These species have some form of natural immune resistance.
- However, **frog immunity is extremely complex**. Immunity might come from anti-microbial chemicals within the skin, symbiotic bacteria on the skin, white blood cells and antibodies in the blood, or combinations of these mechanisms.
- So far, no clear trend has been found between resistance and immune function. To make matters more complicated, there is also evidence chytrid can suppress a host's immune response.
- Because there haven't been any observed chytrid declines in Asia, and because detecting chytrid in Asia has been difficult, **Asia is lagging behind the rest of the world in chytrid research**.
- Yet the **new qPCR test detected high levels of chytrid in a range of amphibian species across India**.
- While the new qPCR test was successful at detecting chytrid in samples from India, Australia, and Panama, we will need to validate and promote the method so it becomes the new gold standard for chytrid testing.

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