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PM SVANIDHI SCHEME



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PRELIMS



POLITY & GOVERNANCE



Start-Ups Intellectual Property Protection (SIPP)

In News: The Ministry of Commerce and Industry recently announced that IP facilitator charges have increased for patent filing under the SIPP scheme.

The facilitation fees has been increased by at least 100%.

About the scheme:

- The scheme was launched in 2016.
- The revised scheme is applicable from 02-12-2022.
- The Scheme is implemented by the Controller General of Patents, Designs, and Trade Mark CGPDTM (under DPITT – MoCI).

Eligibility:

- Companies must be recognized as Start-Up by DPIIT under Start Up India Initiative.
- Period of existence should not exceed 10 years.
- Annual turnover Rs. 100 crore for any financial year since inception.

Mobile app 'Prahari'

Context: Union Home and Cooperation Minister Shri Amit Shah launched the Border Security Force (BSF) mobile app 'Prahari'.

It will also give information related to:

- Bio Data or grievance redressal on "Centralized Public Grievance Redress and Monitoring System" (CP-GRAMS).
- Information on various welfare schemes
- This app will also connect them with the portal of the Ministry of Home Affairs.

About BSF:

- The Border Security Force is India's border guarding organisation on its border with Pakistan and Bangladesh.
- It is one of the seven Central Armed Police Forces (CAPF) of India.
- It was raised in the wake of the 1965 war.
- It is the only CAPF to have a Water Wing, Air Wing and an Artillery Regiment.
- It comes under the Ministry of Home Affairs.
- It currently stands as the world's largest border guarding force.

National Commission for Minorities

Context: The National Commission for Minorities recently held a meeting with the Sikh Intelligentsia for inviting suggestions and advice to make the commemoration of the Veer Bal Diwas more meaningful.

- Recently, the Prime Minister of India has declared that 26th December as "Veer Baal Diwas" to pay homage to the courage of the "Sahibzades", four sons of Guru Gobind Singh, the last Sikh guru.
- While all four were martyred, the date has been chosen as it was the day observed as the martyrdom day of the Sahibzadas Zorawar Singh and Fateh Singh, who were killed at the tender age of six and nine in Sirhind (Punjab) by Mughal forces.

About National Commission for Minorities:

	<ul style="list-style-type: none"> • The National Commission for Minorities (NCM) was set up as per the provisions of the National Commission for Minorities Act, 1992. • Six religious communities, viz; Muslims, Christians, Sikhs, Buddhists, Zoroastrians (Parsis) and Jains have been notified as minority communities by the Union Government all over India. (Jain community was added in 2014). • As per Census 2001, these six communities consists of 18.8% of the country's population. <p>Composition:</p> <p>The act states that the Commission shall consist of:</p> <ul style="list-style-type: none"> • a Chairperson, • a Vice Chairperson and • Five Members to be nominated by the Central Government from amongst persons of eminence, ability and integrity; • The five members including the Chairperson shall be from amongst the minority communities.
City Finance Rankings 2022 and City Beauty Competition	<p>Context: Recently, Ministry of Housing and Urban Affairs has launched 2 key initiatives: City Finance Rankings 2022 and City Beauty Competition.</p> <p>About City Finance Rankings 2022</p> <ul style="list-style-type: none"> • All the Participating cities will be evaluated on 15 indicators across three key municipal finance assessment parameters, namely: <ol style="list-style-type: none"> 1. Resource Mobilization, Expenditure Performance, Fiscal Governance. • Cities will be ranked at national level on the basis of their scores under following four population categories- Above 4 million, Between 1-4 million, 100K to 1 million, Less than 100,000. • Top 3 cities in each population category will be rewarded. <p>About City Beauty Competition:</p> <ul style="list-style-type: none"> • To encourage and recognize transformational efforts made by cities and wards in India to create beautiful, innovative and inclusive public spaces. • Wards and public places of cities would be judged against five pillars- Accessibility, Amenities, Activities, Aesthetics and Ecology. • Most beautiful public places in cities would be awarded first at State level and then will be shortlisted for award at the National level. • Participation in the City Beauty Competition is voluntary.
kangaroo court	<p>Context: A kangaroo court in Tamil Nadu subjected a couple to fine for their love marriage.</p> <p>About kangaroo court:</p> <ul style="list-style-type: none"> • Oxford Dictionary defines it as “an unofficial court held by a group of people in order to try someone, without good evidence”. • It is used to refer to proceedings or activities where a judgement is made in a manner that is unfair, biased, and lacks legitimacy. • Some dictionaries say the association with the animal could have a relation to Australians, though the concept probably originated in America.
Exit Polls	<p>In news: Exit polls of Gujarat State assembly election were recently released.</p> <p>What are Exit polls:</p>

	<ul style="list-style-type: none"> • An exit poll asks voters which political party they are supporting. • It is held after voters have cast their votes in an election; while an opinion poll, is held before the elections. • An exit poll gives an indication of which way the winds are blowing in an election, along with the issues, personalities, and loyalties that have influenced voters. • Exit polls in India are conducted by a number of organisations, often in tie-ups with media organisations. The surveys can be conducted face to face or online. <p>Rules in India:</p> <ul style="list-style-type: none"> • In 1957, during the second Lok Sabha elections, the Indian Institute of Public Opinion had conducted first exit poll. • In India, results of exit polls for a particular election are not allowed to be published till the last vote has been cast. • Exit polls can't be telecasted before voting begins till the last phase concludes
<p>Chairman of Rajya Sabha</p>	<p>Context: Recently, Rajya Sabha welcomed its new Chairman, Shri Jagdeep Dhankhar.</p> <p>About Chairman of Rajya Sabha:</p> <ul style="list-style-type: none"> • Vice-President of India is ex-officio Chairman of the Council of States i.e., Rajya Sabha. <p>Constitutional Provisions:</p> <ul style="list-style-type: none"> • Article 64: The Vice-President shall be ex officio Chairman of the Council of States and shall not hold any other office of profit. • Article 89 of the Constitution provides provision for the Chairman (Vice-President of India) and the Deputy Chairman of the Rajya Sabha. <p>Powers and Functions:</p> <ul style="list-style-type: none"> • The Chairman of the Rajya Sabha is empowered to adjourn the House or to suspend its sitting in the event of the absence of quorum. • The 10th Schedule of the Constitution empowers the Chairman to determines the question as to disqualification of a member of the Rajya Sabha on the ground of defection; • The Chairman's consent is needed to raise a question of breach of privilege in the House. • Parliamentary Committees, regardless of whether set up by the Chairman or by the House, work under the direction of the Chairman. • He nominates members to different Standing Committees and the Department-related Parliamentary Committees. He is the Chairman of the Business Advisory Committee, the Rules Committee and the General Purposes Committee. • It is the duty of the Chairman to interpret the Constitution and rules so far as matters in or relating to the House are concerned, and no one can enter into any argument or controversy with the Chairman over such interpretation <p>Removal of Chairperson:</p> <ul style="list-style-type: none"> • He can only be removed as the chairman of Rajya Sabha when he is removed from the office of Vice-President of India. • While the resolution is in effect for the removal of Vice-President, he cannot preside over the house as chairman, although he can be part of the house.

PM SVANIDHI SCHEME

Context: Recently the Government of India has extended the PM Street Vendor's Atma Nirbhar Nidhi (PM SVANidhi) Scheme beyond March, 2022.

About PM SVANIDHI:

- Ministry of Housing & Urban Affairs launched a scheme PM Street Vendor's Atma Nirbhar Nidhi (PM SVANidhi) to empower Street Vendors by not only extending loans to them, but also for their holistic development and economic upliftment.
- The scheme intends to facilitate collateral free working capital loans of up to INR10,000/- of one-year tenure, to approximately 50 lakh street vendors, to help resume their businesses in the urban areas, including surrounding peri-urban/rural areas.

The PM SVANidhi scheme offers incentives in the form of:

- Interest subsidy @ 7% per annum on regular repayment of loan
- cashback upto INR1200/- per annum on undertaking prescribed digital transactions
- eligibility for enhanced next tranche of loans
- Close to 2 million applications have been received under this scheme, of which 752191 have been sanctioned, and 218751 loans have already been disbursed.

Eligibility Criteria: The PM SVANidhi scheme is available to all street vendors who are engaged in vending in urban areas as on or before March 24, 2020. The eligible vendors are identified as per following criteria:

- Street vendors in possession of Certificate of Vending/Identity Card issued by Urban Local Bodies (ULBs).
- ULBs are encouraged to issue such vendors the permanent Certificate of Vending and Identification Card immediately and positively within a period of one month
- Street Vendors, left out of the ULB led identification survey or who have started vending after completion of the survey and have been issued Letter of Recommendation (LoR) to that effect by the ULB/Town Vending Committee (TVC).
- The vendors of surrounding development/peri-urban/rural areas vending in the geographical limits of the ULBs and have been issued Letter of Recommendation (LoR) to that effect by the ULB/TVC.

About New Extension:

- Extension of lending period till December 2024.
- To extend 'SVANidhi Se Samridhi' component for all beneficiaries of PM SVANidhi scheme across the country.

Meeting the Rising Tide of Case Pendency

Context: The Supreme Court has suggested a less cumbersome and even "out-of-the-box" thinking, including roping in senior lawyers to act as ad hoc judges in High Courts, to meet the rising tide of pendency.

- Senior advocates in High Courts may not be willing to give up their lucrative legal practices permanently but may be interested in joining the Bench as ad hoc judges under Article 224A of the Constitution for a limited period of may be two years.
- Retired judges who were willing to come back to the Bench as ad hoc judges would bring their experience in dealing with arrears.

Background: In April 2021, the court had identified five situations in which the judiciary could seek the aid of ad hoc judges:

- If the vacancies are more than 20% of the sanctioned strength.

- The cases in a particular category are pending for over five years.
- More than 10% of the backlog of pending cases are over five years old.
- The percentage of the rate of disposal is lower than the institution of the cases either in a particular subject matter or generally in the Court.
- Even if there are not many old cases pending, but depending on the jurisdiction, a situation of mounting arrears is likely to arise if the rate of disposal is consistently lower than the rate of filing over a period of a year or more.
- The ad-hoc judges to be appointed to the High Court are not being appointed for the first time. They have served previously and thus have the expertise to deal with the heavy workload. Therefore, the process for their appointment ought to be simpler than regular appointments.
- If the appointment is not made within a few days of the commendation of the Chief Justices of the High Courts, then meritorious candidates end up losing interest and the justice delivery system faces a huge loss.

NOTE:
Article 224A of Indian Constitution

- Deals with the appointment of ad hoc judges in High Courts.
- It is used rarely
- It says “the Chief Justice of a High Court for any State may at any time, with the previous consent of the President, request any person who has held the office of a Judge of that Court or of any other High Court to sit and act as a Judge of the High Court for that State”.
- The Chief Minister will forward his recommendation to the Union Minister of Law and Justice after consultation with the Governor.

Pendency of cases

- Over 59 lakh cases were pending in the High Courts until July 22.
- Allahabad High Court has the highest number of pending cases at over 10 lakh.
- Next are the High Courts of Rajasthan (just over 6 lakh) and Bombay (just under 6 lakh).

Sixth schedule

In News: Several political groups in Ladakh have been demanding Statehood and possible inclusion of Ladakh under the Sixth Schedule of the Constitution, on the lines of Jammu & Kashmir.

The Sixth Schedule:

- It applies to the states of Assam, Meghalaya, Mizoram and Tripura.
- It provides for the formation of Autonomous District Councils (ADCs) that have some legislative, judicial, and administrative autonomy within a state.
- ADCs have up to 30 members with a term of five years.
- ADCs can make laws, rules, and regulations with regard to land, forest, water, agriculture, village councils, health, sanitation, village- and town-level policing, inheritance, marriage and divorce, social customs and mining,
- The Bodoland Territorial Council in Assam is an exception with more than 40 members and the right to make laws on 39 issues.

Agristack Project

Context: The Department of Agriculture has commenced the work for creating Agristack and has finalized the core concept of “India Digital Ecosystem of Agriculture (IDEA)” which lays down a framework for Agristack.

- Agristack is a federated structure and ownership of data is with the States only.
- Access to federated Farmers’ database is with Government only. No private company is involved in developing the federated Farmers’ database.

What is Agristack?

- Agristack is a collection of technologies and digital databases that focuses on farmers and the agricultural sector.
- Agristack will create a unified platform for farmers to provide them end to end services across the agriculture food value chain.
- It is in line with the Centre’s Digital India programme, aimed at providing a broader push to digitise data in India, from land titles to medical records.
- Each farmer will have a unique digital identification (farmers’ ID) that contains personal details,
- Each ID will be linked to the individual’s digital national ID Aadhaar.

Benefits

- Problems such as inadequate access to credit and information, pest infestation, crop wastage, can be addressed by use of digital technology
- It will increase innovation and investment towards the agricultural sector

Focus Areas:

- Consolidating Agriculture ecosystem across the value chain (farm to fork) to empower the farmer using data analytics in 100 villages.
- Establishment & launch of “Nation Agriculture Geo Hub” and for using their ‘ArcGIS’ platform enabling a GIS layer over farmers’ database.
- Digital services across the agriculture value chain and creating an innovation ecosystem around digital agriculture.
- Building a customized ‘site specific crop advisory’ service and digitization of dairy value chain and support wheat crop operations
- Effective knowledge sharing between farmers, administration, academia and industry
- Digital marketplace to contribute effectively towards increasing the income of farmers and improve farm efficiency/efficiency of the agriculture sector
- Create AI/ML solution.

Zonal Councils

In News: Union Home and Cooperation Minister Shri Amit Shah presided over the 25th Eastern Zonal Council meeting .

Aim of Zonal councils:

- To solve inter-State problems and foster balanced socio-economic development of the respective zones.
- To develop the habit of cooperative working among these States

Zonal Councils:

- The idea of creation of Zonal Councils was mooted by the first Prime Minister of India, Pandit Jawahar Lal Nehru in 1956

- Five Zonal Councils were set up vide Part-III of the States Re-organisation Act, 1956 – north, south, east, west and central.
- The North Eastern States i.e. (i) Assam (ii) Arunachal Pradesh (iii) Manipur (iv) Tripura (v) Mizoram (vi) Meghalaya and (vii) Nagaland are not included in the Zonal Councils
- Their special problems are looked after by the North Eastern Council, set up under the North Eastern Council Act, 1972.
- The State of Sikkim has also been included in North Eastern Council vide North Eastern Council (Amendment) Act, 2002.

Organisational structure:

- Chairman – The Union Home Minister is the Chairman of each of these Councils.
- Vice Chairman – The Chief Ministers of the States included in each zone act as Vice-Chairman of the Zonal Council for that zone by rotation, each holding office for a period of one year at a time.
- Members- Chief Minister and two other Ministers as nominated by the Governor from each of the States and two members from Union Territories included in the zone.
- Each Zonal Council has set up a Standing Committee consisting of Chief Secretaries of the member States of their respective Zonal Councils.
- Union Ministers are also invited to participate in the meetings of Zonal Councils depending upon necessity.

Role & Objective:

- National integration
- Arresting the growth of acute State consciousness, regionalism, linguism and particularistic tendencies;
- Enabling the Centre and the States to co-operate and exchange ideas and experiences;
- Establishing a climate of co-operation amongst the States for successful and speedy execution of development projects.

Functions:

- Each Zonal Council is an advisory body and may discuss any matter in which States have a common interest and advise the Government.
- In particular, a Zonal Council may discuss, and make recommendations with regard to:
 - Any matter of common interest in the field of economic and social planning;
 - Any matter concerning border disputes, linguistic minorities or inter-State transport;
 - Any matter connected with or arising out of, the re-organization of the States under the State’s Reorganisation Act.

Amrit Bharat Station Scheme for Indian Railways

Aim:

- “Amrit Bharat Station” scheme aims at preparation of Master Plans of the Railway stations and implementation of the Master Plan in phases to enhance the facilities including Minimum Essential Amenities (MEA) and aiming for creation of Roof Plazas and city centres at the railway stations in long run.
- Introduction of new amenities as well as upgradation and replacement of existing amenities.

	<ul style="list-style-type: none"> This scheme will also cover the stations where detailed techno-economic feasibility studies have been conducted. <p>Scope of work:</p> <ul style="list-style-type: none"> The scheme aims to relocate redundant/old buildings in a cost efficient manner Provide good cafeteria/retail facilities Space shall also be created for Executive Lounges and places for small business meetings. Elements of landscaping, green patches and local art and culture should be used High level platforms(760-840 mm) shall be provided at all categories of stations. Drainage of platform areas is of utmost importance. Provisions may be made such that station provides free WIFI access to its users. Enough toilets shall be provided at all categories of stations with separate provisions for women and Divyangjan Gradual shift to sustainable and environmentally friendly solutions as per availability of funds and condition of existing assets.
<p>Special Category Status (SCS)</p>	<p>Context: Recently, the Chief Minister of Andhra Pradesh requested the Prime Minister for the grant of Special Category Status (SCS).</p> <p>About SCS:</p> <ul style="list-style-type: none"> This concept was first introduced in 1969 when the 5th Finance Commission sought to provide certain disadvantaged states with preferential treatment. This concept was named after Dr Gadgil Mukherjee (the then Deputy Chairman of the Planning Commission) and is related to the transfer of assistance to the states by centre under various schemes. States with special category status (SCS): Arunachal Pradesh, Assam, Himachal Pradesh, Jammu and Kashmir, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, Tripura and Uttarakhand. No constitutional provision for the categorization of any state in India as a 'special category. However, a wide range of provisions are available to as many as 10 states that have been listed under Articles 371, 371-A to 371-H, and 371-J. After the dissolution of the planning commission and the formation of NITI Aayog, the recommendations of the 14th Finance Commission were implemented which meant the discontinuation of the Gadgil formula-based grants. The 14th FC effectively removed the concept of special category status after its recommendations were accepted in 2015. <p>Criteria for special category status:</p> <ul style="list-style-type: none"> Hilly and difficult terrain. Low population density or sizeable share of tribal population. Strategic location along borders with neighbouring countries. Economic and infrastructural backwardness. Non-viable nature of state finances.
<p>International Arbitration Centre</p>	<p>In News: The New Delhi International Arbitration Centre (Amendment) Bill was passed by the Rajya Sabha on 14th December 2022.</p>

- The Bill renames the New Delhi International Arbitration Centre as the India International Arbitration Centre.

Background

- Setup in 2019 under the provisions of New Delhi International Arbitration Centre (NDIAC) Act, 2019
- Objective: For better management of arbitration in India.
- The Act declared NDIAC as an institution of national importance.
- Replaced the International Centre for Alternative Dispute Resolution (ICADR), which was established in 1995.

Composition:**The NDIAC consists of seven members including:**

- A Chairperson who may be a Judge of the Supreme Court or a High Court, or an eminent person with special knowledge and experience in the conduct or administration of arbitration;
- Two eminent persons having substantial knowledge and experience in institutional arbitration;
- Three ex-officio members, including a nominee from the Ministry of Finance and a Chief Executive Officer (responsible for the day-to-day administration of the NDIAC);
- A representative from a recognized body of commerce and industry, appointed as a part-time member, on a rotational basis.

Term and Superannuation:

- The members of NDIAC will hold office for three years and will be eligible for re-appointment.
- The retirement age for the Chairperson is 70 years and other members is 67 years.

India as an International hub of Arbitration

- India is the fifth biggest economy in the world, yet we are not the international hub of arbitration, while small countries and cities have emerged as major centres for arbitration.
- Presently, places such as Singapore, London and Hong Kong are the preferred centres for arbitration.
- NDIAC can provide arbitration awards at more affordable charges in comparative to those centres.

Alternative Dispute Resolution (ADR) Mechanisms

- ADR is a mechanism of dispute resolution that is non adversarial, i.e. working together co-operatively to reach the best resolution for everyone.
- ADR can be instrumental in reducing the burden of litigation on courts, while delivering a well-rounded and satisfying experience for the parties involved

Arbitration: The dispute is submitted to an arbitral tribunal which decides (an “award”) on the dispute that is mostly binding on the parties.

Mediation: In mediation, an impartial person called a “mediator” helps the parties try to reach a mutually acceptable resolution of the dispute.

- Arbitration and mediation have a long history in India.

	<ul style="list-style-type: none"> Recently they have acquired prominence across the world as methods of dispute resolution.
<p>Pradhan Mantri Formalisation of Micro Food Processing Enterprises (PMFME) Scheme</p>	<p>Context: Minister of State for Food Processing Industries have informed that the total amount of Centre’s Share of credit-linked subsidy provided under the PMFME Scheme is Rs.110.86 crore.</p> <p>About the PMFME scheme:</p> <ul style="list-style-type: none"> Pradhan Mantri Formalisation of Micro food Processing Enterprises (PMFME) Scheme was launched under the ‘Aatmanirbhar Bharat Abhiyan’ and ‘Vocal for Local’ campaigns, to provide technical, financial and business support to micro food processing units in the country. The government intends to provide direct financial and technical assistance to about 200,000 micro food processing units under this scheme. <p>Objectives of the scheme:</p> <ul style="list-style-type: none"> Credit access to existing micro food processing businesses, Farmer Producer Organisations (FPOs), co-operatives, and Self-Help Groups (SHGs), for technology upgradation Assistance to 200,000 existing micro food processing units to transform them into organised units, by strengthening their marketing & branding, and integrating the supply chain with formal units Increased access to shared services, such as storage, incubation facilities, and packaging. Professional and technical support for food processing entrepreneurs. Proper training and research to individual or group owned food processing enterprises. <p>The PMFME Scheme has adopted the One District One Product approach.</p> <ul style="list-style-type: none"> Under this approach, the states identifies and selects a food product for the district, that could be a perishable agricultural crop, such as cereals, or a food product that is largely produced in the district.
<p>J and K Land Grants Rules</p>	<p>In News: The J&K Lieutenant Governor’s administration notified fresh land rules under J&K Land Grant Rules-2022 and replaced the J&K Land Grants Rules-1960, which dealt with the special rules to grant government land on lease in erstwhile State of J&K.</p> <p>Previous rules:</p> <ul style="list-style-type: none"> Prime locations such as Srinagar, Jammu, Gulmarg and Pahalgam were opened up for construction of hotels, commercial structures and residential buildings in the past. These land laws were considered as the backbone of J&K’s upper middle class and allowed a new chain of hotels and commercial structures to come up in prime locations. <p>Need for amendment:</p> <ul style="list-style-type: none"> Because the previous land laws were “regressive”. The present land holders just paid ₹5 to enjoy profit from ₹100 crore property. <p>New rules:</p> <ul style="list-style-type: none"> Leases of current land owners will not be extended in case of expiry. Expired leases shall not be renewed and shall stand determined.

- lease period has been reduced to 40 years (earlier 99 yrs.)
- Outgoing lease holders to evict properties or else face evictions.
- An expert committee will enlist all properties where lease had ended.
- It will be e-auctioned afresh.
- The rules open bidding to “any person legally competent under Section 11 of the Indian Contract Act, 1872.”
- These rules deem a person or an entity in default of Government Revenue accrued to the government under J&K Land Grant Act, 1960 or Government convicted under Prevention of Money Laundering Act, 2002 shall not be eligible for participation in the auction.
- According to now-repealed land laws, no such land shall be granted on lease to the person, who is not a permanent residence of the State; except where the Government, for the reasons to be recorded, relax this restriction in the interest of industrial or commercial development or in the favour of a registered charitable society.

Impact of new rules:

- Hundreds of properties will open for fresh auction, where outsiders could also participate.
- Tourist hotspots Gulmarg, Pahalgam, Srinagar and Jammu’s Patnitop will go up for auction.



ECONOMY


Foreign Exchange Management Act

In news: Actor Vijay Devarakonda appeared before Enforcement Directorate in connection with the Foreign Exchange Management Act (FEMA) investigation for producing the recent multilingual movie, 'Liger' which had a cameo by boxing legend Mike Tyson.

Foreign Exchange Management Act (FEMA):

- It is an act of Parliament of India
- Introduced in 1999 to replace the draconian FERA (Foreign Exchange Regulation Act).
- FEMA outlines the formalities and procedures for the dealings of all foreign exchange transactions in India.
- These foreign exchange transactions have been classified into two categories — Capital Account Transactions and Current Account Transactions.
- This act makes offences related to foreign exchange civil offenses.
- It also paved the way for the introduction of the Prevention of Money Laundering Act 2002.
- Principles – all current account transactions are permitted unless expressly prohibited and all Capital account transactions are prohibited unless expressly permitted.

Prevention of Money Laundering Act (PMLA) 2002

In News: The Finance Ministry notified changes to the Prevention of Money Laundering Act (PMLA), 2002

Changes to PMLA 2002: Allowed Enforcement Directorate (ED) to share incriminating information and material about economic offenders with 15 more agencies. These include

- National Investigation Agency (NIA)
- Serious Fraud Investigation Office (SFIO)
- Directorate General of Foreign Trade (DGFT)
- Competition Commission of India (CCI)
- National Intelligence Grid
- Central Vigilance Commission (CVC)
- Wildlife Crime Control Bureau
- MEA, State Police Department, regulators under various Acts, Defence Intelligence Agency, National Technical Research Organisation, Military Intelligence, inquiry authority under Central Civil Services Rules.
- Earlier, the ED was permitted to share data with only 10 agencies, including CBI, RBI, Sebi, IRDAI, Intelligence Bureau, and Financial Intelligence Unit (FIU), among others.
- Apprehend social evils and bring them to justice in the court of law

Prevention of Money Laundering Act(PMLA):

- It is a criminal law of the Parliament of India passed by the NDA government in 2002
- PMLA became law and came into force on July 1, 2005.
- It has blanket powers assigned to the Enforcement Directorate (ED) under PMLA for seizing, investing, searching and attaching assets.

	<ul style="list-style-type: none"> Introduced due to India’s commitment at the Vienna Convention to combat money laundering.
<p>Horticulture Cluster Development Programme</p>	<p>Context: The Cluster Development Programme has a great potential to transform the entire horticulture ecosystem by creating last-mile connectivity with the use of multimodal transport for efficient and timely evacuation and transportation of horticulture produce.</p> <ul style="list-style-type: none"> Nodal Agency: The National Horticulture Board (NHB) Aim: To improve exports of targeted crops by about 20% and create cluster-specific brands to enhance the competitiveness of cluster crops. <p>Key Features:</p> <ul style="list-style-type: none"> CDP will support integrated interventions to enhance the competitiveness of targeted clusters. The interventions have been classified into the following three verticals: <ol style="list-style-type: none"> Pre-production and Production Post-harvest Management and Value Addition Logistics, Marketing and Branding MoA&FW has identified 55 horticulture clusters. It will promote integrated and market-led development of pre-production, production, post-harvest, logistics, branding, and marketing activities. <p>Significance:</p> <ul style="list-style-type: none"> The CDP will benefit around 10 lakh farmers and related stakeholders along the value chain. The overall development of horticulture in the country would be focused with the help of the implementation of this Programme.
<p>The Paris Club</p>	<div data-bbox="343 1220 901 1713" data-label="Diagram"> </div> <p>In News: Paris Club creditor nations are proposing a 10-year moratorium on Sri Lankan debt and another 15 years of debt restructuring as a formula to resolve the Sri Lankan debt crisis.</p> <ul style="list-style-type: none"> Earlier this year, Sri Lanka had defaulted on its 51 billion dollar external debt in the midst of spiralling political and economic crisis. The Paris club has also called upon the Global north and south to take a similar haircut in restructuring of Sri Lankan debt. <p>The Paris Club:</p> <ul style="list-style-type: none"> It is an informal group of official creditors from 22 wealthy countries who find sustainable solutions for challenges faced by debtor countries. It provides a platform for governments facing financial difficulties to reduce and renegotiate their debt repayments. Formed in 1956, it has signed more than 400 agreements to date, worth more than half a trillion dollars to about 100 countries.

	<ul style="list-style-type: none"> • The “G20 Common Framework” is an initiative endorsed by the G20 together with the Paris Club. • Other creditor nations are allowed to participate in negotiation meetings on a case-by-case basis, if they meet certain conditions. • The members meet in Paris once a month except for February and August. • The Paris Club invites debtor nations to a meeting with its creditors after it has concluded an appropriate program with the IMF (International Monetary Fund) that shows that the country cannot meet its external debt obligations, and therefore requires a new payment arrangement with its foreign creditors. • Representatives of the World Bank, the IMF and other international institutions, plus the relevant regional development bank, may also attend the meeting as observers. • The debtor country’s representative is usually its Minister of Finance, who heads a team comprising officials from his or her ministry and the central bank.
‘Rooh Afza’ Trademark Verdict	<p>Context: Recently, the Delhi High Court, in the case of Hamdard National Foundation (India) vs Sadar Laboratories Pvt. Ltd., restrained Sadar Laboratories from manufacturing and selling beverages under the impugned trademark ‘Dil Afza’.</p> <ul style="list-style-type: none"> • The manufacturers of ‘Rooh Afza’ claimed that the design of the product ‘Dil Afza’ is deceptively similar to the trademark of ‘Rooh Afza’ which is a highly reputed sharbat (sweet beverage). <p>About Trade mark:</p> <ul style="list-style-type: none"> • Trademark refers to graphical representation of goods or services to make it distinguishable from others. • It can be words, symbols, sound, colours, shape of goods, graphics representation or packaging etc. • It protects owner against unfair competition, prevents damage to reputation of owner and consumer welfare. • In India, trademarks are governed under Trademarks Act, 1999 (it deals with precise nature of rights one can acquire in respect of trademarks), under aegis of Department of Industrial Policy & Promotion (DIPP), Ministry of Commerce. • The implementing body is Controller General of Patents, Designs and Trademarks.
Remission of Duties and Taxes on Exported Products (RoDTEP) Scheme	<p>In News: RoDTEP Scheme was extended to Chemicals, Pharmaceuticals and Articles of Iron & Steel.</p> <p>About the scheme:</p> <ul style="list-style-type: none"> • RoDTEP stands for Remission of Duties and Taxes on Export Products. • The scheme is being implemented from 1st January 2021 • It replaced MEIS (Merchandise Exports from India Scheme). • RoDTEP is based on the globally accepted principle that taxes and duties should not be exported, and taxes and levies borne on the exported products should be either exempted or remitted to exporters. • The RoDTEP scheme rebates/refunds the embedded Central, State and local duties/taxes to the exporters that were so far not being rebated/refunded.

The Telecom Regulatory Authority of India (TRAI)

In News: The Telecom Regulatory Authority of India (TRAI) has issued its recommendations on “Renewal of Multi-System Operators (MSOs) Registration”.

About Telecom Regulatory Authority of India (TRAI)

- It is a statutory body, established in 1997 by the Telecom Regulatory Authority of India Act, 1997
- It is headed by a chairman and not more than two full-time members and not more than two part-time members.
- TRAI is administered through a secretariat headed by a secretary under Ministry of Communications and Broadcasting.
- The TRAI Act was amended by an ordinance, effective from 24 January 2000, establishing a Telecommunications Dispute Settlement and Appellate Tribunal (TDSAT) to take over the adjudicatory and disputes functions from TRAI.
- TRAI has brought out **MyCall app, MySpeed app and Do not disturb (DND 2.0)** apps to ensure that there is transparency between what consumers are paying for and what telecom operators are promising to provide at a certain rate.

Coal economy

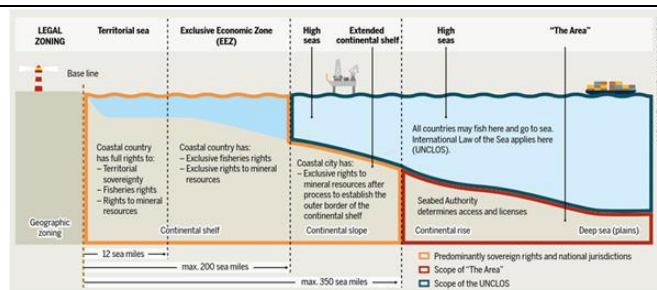
In News: IEA’s Coal 2022: Analysis and forecast to 2025 report says coal is set to continue to be the growth engine of global coal demand.

- Global coal demand reached eight billion tonnes this year.
- In the absence of low-emissions alternatives that can replace coal in the iron and steel sector in the near term, global coal demand is set to remain flat through the forecast period.

India:

- India, along with China, is the world’s largest coal producer, consumer, and importer.
- Its own coal production will surpass a billion tonnes by 2025 as per the annual report of the International Energy Agency (IEA).
- India’s coal consumption has doubled since 2007 at an annual growth rate of 6 per cent.
- India and China, are also the only two countries globally where there has been an uptick in investment in coal mine assets because domestic production has been ramped up in both countries to reduce external reliance.

Maritime Anti-Piracy Bill 2022



In News: Parliament has passed the Maritime Anti-Piracy Bill 2022 with Rajya Sabha approving it.

About the bill:

- The Bill defines piracy as any illegal act of violence, detention, or destruction against a ship, aircraft, person, for private purposes, by the crew or passengers of a private ship or aircraft.
- The Bill enables Indian authorities to act against piracy on the high seas.
- It applies to the sea beyond the Exclusive Economic Zone (EEZ)
- EEZ is beyond 200 nautical miles from India’s coastline.

Raktsey Karpo Apricot, Tandur Red Gram and Alibag White Onion – newly added GI Tags

Context: Adding to the present collection of GIs, 03 new items from various states of India such as Tandur Redgram of Telangana, Raktsey Karpo Apricot of Ladakh, Alibag White Onion of Maharashtra have been given the coveted GI Tags.



About Raktsey Karpo Apricot:

- Raktsey Karpo, from family of apricot, packed with vitamins and low on calories is rich in sorbitol – a natural glucose substitute that can be consumed by diabetics.
- The oil from its seed is known to relieve back aches and joint pain.
- These apricots are grown organically without using

any chemical fertilisers.

- In Ladakh, it is locally known as ‘Chuli’.
- The native apricot genotypes of Ladakh possess unique characteristics, such as high TSS (Total dissolved solids) content, late and extended flowering and fruit maturity, and white seed stone phenotype.
- They are divided into two sub-groups based on seed stone colour.
- Raktsey Karpo (Rakstey means seed, karpo means white): Fruit with white seed stone.
- Raktsey Nakpo or Nyarmo (black seeded): Fruit with brown seed stone.
- It is being promoted under One District One Product for Kargil (Ladakh).
- In India, it is grown in Jammu and Kashmir, Himachal Pradesh, Uttarakhand and to a limited extent in North Eastern Hills.
- Tree can tolerate winter temperatures as cold as –30 °C or lower if in healthy sate.



About Tandur Red Gram of Telangana:

- It is a local variety of pigeon pea which is mainly grown in the rainfed areas of the Tandur and nearby places in the state.
- As per the researchers, the fertile deep black soil with clay minerals specifically in Tandur Region along with huge limestone deposits can be attributed

to the specific quality traits of Tandur Redgram.

- It contains about 24 percent protein, which is almost three times that of cereals, and is popularly known for its very good taste, and better cooking quality.



About Alibag White Onion of Maharashtra:

- It is known for its unique sweet taste, no-tear factor, and medicinal properties.
- The soil of Alibaug taluka has low sulphur content and its geo-climatic conditions make it unique compared to other white onion-producing areas.

- White onions are an excellent source of antioxidants that contain more than 25 different types of flavonoids which lowers the risk of developing chronic diseases like diabetes, cancer, and heart disease.



INTERNATIONAL RELATIONS



Asia-Pacific Broadcasting Union

In News: Prasar Bharati, India's Public Service Broadcaster, hosted the 59th Asia Pacific Broadcasting Union (ABU) General Assembly 2022. The conference began in New Delhi on 25th of November

- **Theme** – ‘Serving The People-Media’s Role In The Time Of Crisis’

ABU:



- Established in 1964 as a not-for-profit, non-government, non-political, professional association.
- It is the biggest broadcasting union in the world.
- It covers around 70 countries and 5 continents and has 250 members.

Indian members:

- All India Radio / Prasar Bharati (AIR)
- Doordarshan / Prasar Bharati (DD)

Functions:

- ABU organises key industry, regional and global conferences and summits as platforms for exchanging ideas, experiences and practices.
- The ABU Media Academy is a centre of excellence and learning, providing hundreds of courses and capacity building activities annually
- It provides rights-free content acquisition for developing countries, negotiates rights for major sports events and organises coverage for the region.
- It trains and equips media practitioners on role of media in the time of crisis.
- It also discovers the latest trends and challenges, bringing together members of journalistic community and academia from this vast region and engage them into intense learning, discussions, exchange of ideas and networking.

Wassenaar arrangement

In news: India will assume chairmanship of Wassenaar arrangement on 1 Jan 2023.

- India has also assumed the presidency of the UNSC.

Wassenaar arrangement:

- Established in 1996
- It is a voluntary multilateral export control regime.
- Member states exchange information on various issues like transfer of conventional arms and dual-use goods and technologies.
- **Dual-use** refers to the ability of a good or technology to be used for multiple purposes - usually peaceful and military.
- Wassenaar Arrangement’s Secretariat is in Vienna, Austria.
- It has 42 member states.
- India became a member of the Arrangement in 2017.

	<p>Significance for India:</p> <ul style="list-style-type: none"> • India would be able to prevent arms diversion to terrorists or to sovereign nations supporting terrorism. • India could play a significant role in democratising access to technologies and processes that can serve as crucial building blocks for the newly emerging defence and space manufacturing sectors in India. • India is slowly emerging as a low-cost producer of several items in the WA's control lists.
<p>Singapore Declaration</p>	<p>In News: The 17th Asia Pacific Regional Meeting (APRM) of the International Labour Organization (ILO) was held in Singapore.</p> <p>Singapore Declaration:</p> <ul style="list-style-type: none"> • The Singapore Declaration aims to ensure social dialogue to address challenges associated with labour market and finding solutions for crises like the COVID-19 pandemic, natural disasters, and economic uncertainty. • It provides a shared vision of 10-point priorities of national action of members of the ILO to deal with issues like dwindling wages, inflation and unemployment. • It recognized that social dialogue is vital for gaining trust and resilience in the labour market institution, sustainable recovery, and inclusive global progress. • Strong and representative organizations of labours and employers are critical for building sustainable and inclusive societies and fundamental for achieving social justice and decent job opportunities. • Capacity must be strengthened for employers, labour organizations and governments in countries where there is insufficient capacity, mechanism or freedom to contribute in the policy development and discussion. • The governments must ensure that labour interests are protected through the promotion of freedom of association and the recognition of the right to collective bargaining throughout the regions, including for marginalized workers and informal workforce. • The gender gaps must be addressed across the world by increasing the participation of women in the job market, promoting equal pay for equal value, balancing work and responsibilities, and promoting women's leadership. • Collective actions must be taken to promote a smooth and sustained transition from the informal to formal economy. • The rights of migrant workers must be protected by strengthening governance frameworks and respecting the freedom of association. Efforts must be taken to improve their accommodation, protect their wages, and extend social security, and where appropriate, through enhanced bilateral labour migration agreement between the sending and receiving countries. • Governments must facilitate the smooth transition to peace, security and decent work during times of crises. • Just transitions must be ensured to build environmentally sustainable economies and societies, through meaningful and effective social dialogue.



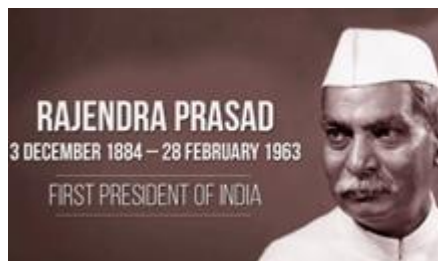
HISTORY AND ART & CULTURE

**Dr. Rajendra Prasad**

Context: Prime Minister of India paid tribute to former president of India Dr. Rajendra Prasad on his birth anniversary on 3rd December 2022.

About Dr. Rajendra Prasad:**Personal Life:**

- Birth: He was born on 3rd December, 1884 in Siwan district of Bihar.
- Education: He joined the Calcutta Presidency College in 1902. After completing his Master's degree in Economics from the University of Calcutta in 1907, he went on to study law at the Calcutta Law College and practised at the Calcutta High Court.
- He completed his Doctorate in Law from Allahabad University in 1937.
- In the early 1920s, he became the editor of a Hindi weekly Desh and an English biweekly, Searchlight.

**Indian National Movement:**

- Prasad attended the 1906 Calcutta session of Indian National Congress.
- He joined the party in 1911 and was later elected to the All India Congress Committee after which he met Mahatma Gandhi.
- He was highly impressed by Mahatma Gandhi and he supported Gandhi during the Satyagraha Movement against Indigo Planters in Champaran, Bihar.
- He later quit his lucrative career as a lawyer in 1920 and jumped into Freedom Struggle Movement and participated in the Non-Cooperation Movement.
- He led the Non-Cooperation Movement in Bihar holding meetings, touring state and making speeches. He urged people to boycott government schools, colleges, jobs.
- He started the National College in Patna in 1921 to promote Swadeshi asking people to boycott foreign goods.
- He set up the Quetta Central Relief Committee in Sindh and Punjab under his own presidency after 1935 Quetta Earthquake.
- Prasad was elected as the President of the Bombay Session of the Indian National Congress in October 1934.
- He was also elected as the President for second time in 1939 after Subhash Chandra Bose resigned from his post and third time President of INC in 1947 when J.B.Kripalani resigned from his post.
- Prasad was arrested several times during the national struggle and imprisoned by British authorities during the Salt Satyagraha of 1931 and the Quit India Movement of 1942.

Contribution to Constitution Making:

- In 1946, Rajendra Prasad joined the Interim Government of India as the Minister of Food and Agriculture.

Committees of Constituent Assembly under the chairmanship of Dr. Prasad includes:

- Ad hoc Committee on the National flag
- Committee on the Rules of Procedure
- Finance and Staff Committee
- Steering Committee

Literary Works:

- Satyagraha at Champaran (1922)
- India Divided (1946)
- Atmakatha (1946) his autobiography written during his 3 year prison term in Bankipur Jail.
- Mahatma Gandhi and Bihar, Some Reminiscences (1949)
- Babu Ke Kadmon Mein (1954)
- Since Independence (1960)

Mahaparinirvan Diwas

In News: Bharat Ratna Dr BR Ambedkar’s 67th Mahaparinirvan Diwas or death anniversary was celebrated recently.

About BR Ambedkar:

- Dr Ambedkar was a jurist, economist, politician and a social reformer who campaigned against social discrimination of downtrodden, women and labourers.
- He was born in 1891 in Mhow Army Cantonment, Madhya Pradesh
- Known as The Father of the Indian Constitution
- He was conferred the Bharat Ratna posthumously in 1990.



Education:

- He completed his matriculation from Elphinstone High School.
- He completed his Post Graduation in Economics.
- He completed another doctorate from the London School of Economics – thesis “The problem of the rupee: Its origin and its solution”.
- He completed his Ph.D. degree in Economics from the University of Columbia.

Contributions:

- In 1919, in his testimony before the Southborough Committee in preparation of the Government of India Act Ambedkar opined that there should be a separate electoral system for the Untouchables and other marginalized communities.
- In 1920, Ambedkar launched a newspaper called “Mooknayaka” (leader of the silent) with the assistance of Shahaji II, the Maharaja of Kolhapur
- In 1923, he set up the Bahishkrit Hitkarini Sabha (Outcastes Welfare Association)
- Ambedkar launched full-fledged movements for Dalit rights by 1927 and demanded public drinking water sources open to all and right for all castes to enter temples.
- In 1932, Ambedkar signed the Poona Pact.

	<ul style="list-style-type: none"> • He participated in all three round table conferences in London and demanded separate electorate for untouchables. • In 1936, Founded the Independent Labor Party and his party contested the 1937 elections to the Central Legislative Assembly. • In 1942, founded Scheduled Castes Federation. • In 1947 Dr. Ambedkar was appointed as the chairman of the constitution drafting committee. • In 1950, founded the Bharatiya Bauddha Mahasabha. • In 1956 Ambedkar organized a public ceremony to convert around five lakh of his supporters to Buddhism. • By December 2nd, 1956 he completed his final manuscript, "The Buddha or Karl Marx" • On 6 December 1956, he died at his home in Delhi. <p>Books and periodicals:</p> <ul style="list-style-type: none"> • Bahishkrit Bharat(1927) • Samatha(1929) • Janata(1930) • Mook Nayak (weekly) • Annihilation of caste • Philosophy of Hinduism • Riddles in Hinduism • Who were the Shudras?
Sangai Festival	<p>Context: Recently the Prime Minister of India addressed the Manipur Sangai Festival via video message.</p> <p>About Sangai Festival:</p> <ul style="list-style-type: none"> • The festival is named after the state animal, Sangai, the brow-antlered deer found only in Manipur. • Sangai festival is an annual cultural festival organised by Manipur Tourism Department every year. • Many editions of this Festival has been celebrated over the past few years with the name of Tourism Festival, since 2010 this has been renamed as the Sangai Festival. • This festival is being celebrated to promote Manipur as a world class tourism destination. <p>It showcases the states contributions to: art and culture, handloom, handicrafts, fine arts, indigenous sports, cuisine, music and adventure sports, natural environment.</p>
Sylhet-Silchar festival	<p>Context: The first edition of the Sylhet-Silchar Festival was organized on 7th December, 2022, in Assam's Barak Valley to celebrate the cultural ties between India and Bangladesh.</p> <ul style="list-style-type: none"> • The festival coincides with the 75th year of India's independence and the 50th anniversary of the liberation of Bangladesh from Pakistan. <p>About Sylhet-Silchar festival:</p>

- Organised by the India Foundation and has been supported by the Union Ministry of Culture and the Assam government in association with the Bangladesh India Friendship Society and India-Bangladesh Chamber of Commerce and Industry.
- The festival underlines the commonalities between India and Bangladesh, specifically the Sylheti variant of the Bengali language and the Sylheti culture.

Significance:

- The aim of the festival is to revisit the common values and shared heritage of the twin cities and their people separated by international borders.
- The festival will showcase tribal culture, cuisine, literature, arts, and crafts.
- The festival will also bring together eminent people from public and social life, industrialists, artists, scholars, and practitioners from both sides to discuss and deliberate on issues of mutual growth and opportunity.
- In addition, the Festival will also provide a platform to explore multi-disciplinary trade opportunities in sectors such as healthcare, tourism, education, and digital infrastructure.

Pt. Madan Mohan Malviya

In News: The Prime Minister, Shri Narendra Modi has paid tributes to Pt. Madan Mohan Malviya on his Jayanti. Shri Modi recalled Pt. Madan Mohan Malviya’s memorable contribution to enrich the education sphere.

Pt. MM Malviya:

- Born in Allahabad on December 25, 1861, Malviya took early education under the ‘Pathshala’ system, and was proficient in Sanskrit.
- In 1879, he graduated from the Muir Central College (today’s Allahabad University) and started working as a teacher at a local high school.



Contributions:

- Founded Hindu Mahasabha in 1906
- Founded Banaras Hindu University (BHU) in 1915
- Malviya joined the Indian National Congress at its Calcutta session in 1886.
- He was president of INC four times – in 1909, 1918, 1932 and 1933.
- He was a social reformer and a successful legislator, serving as a member of the Imperial Legislative Council for 11 years (1909–20).
- Malviya espoused free and compulsory primary education, opposed the system of indentured labour in the British Empire, and supported the nationalisation of railways.
- In 1930, when Mahatma Gandhi launched the Salt Satyagraha and the Civil Disobedience Movement, he participated in it and courted arrest.
- He gave two famous speeches on communal harmony- one in Lahore in 1922 and in Kanpur 1931.
- He created a non-governmental organization named Shri Mathura Vrindavan Hasanand Gochar Bhoomi in Vrindavan for Welfare of Cow.

Achievements:

- He is referred to as ‘Mahamana’

- In 2015, the government bestowed Malviya with the Bharat Ratna, India’s highest civilian honour, 68 years after his death.
- In 2016, the Indian Railways started the Varanasi-New Delhi Mahamana Express in the leader’s honour.
- Books – A Criticism of Montagu-Chelmsford Proposals of Indian Constitutional Reform, Speeches and Writings.

Ratnagiri’s pre-historic rock art

Context: Experts and conservationists have raised concerns that the proposed mega oil refinery in Barsu village, Maharashtra, may damage nearby prehistoric geoglyphs.

About the art:



- It is also known as Katal Shilpa locally in Ratnagiri.
- These sites are protected by state archaeology department and the Archaeological Survey of India (ASI).
- Ratnagiri-based non-profit organisation Nisarga Yatri Sanstha has been working for the last few years to find and preserve geoglyphs in the Konkan region.
- It has more than 1500 petroglyphs.
- Petroglyphs: It is an image drawn on rock surface using incising, picking, carving and abrading as rock art.
- UNESCO dates these sites over 12,000 years old using carbon and geological dating.
- UNESCO listing mentions “Konkan geoglyphs.”

About geoglyphs:

- It is a form of prehistoric rock art.
- It is carved on Laterite stone.
- It can be in the form of rock paintings, etchings, cup marks and ring marks.
- India’s largest rock engraving or geoglyph is in Kasheli in the Ratnagiri district.
- It has 18X13 metres large figure of an elephant.
- Some of these clusters have one or two standalone figures of larger-than-life scale and others show multiple figures gathered together.

Significance of the rock art:

- It is evidence of the continued existence of human settlements from the Mesolithic (middle stone age) to the early historic era.
- It is amongst three potential sites to become world heritage sites.
- The other two include Jingkieng Jri, the living root bridge in Meghalaya, and Sri Veerabhadra Temple in Andhra Pradesh’s Lepakshi.
- It depicts how people adapted to wetlands in a dry-arid plateau having shallow rock pools, streams and watercourses.
- Its clusters are examples of advanced artistic skills showing evolution of techniques of etching and scooping in rock art.

	<ul style="list-style-type: none"> • It has carvings of humans and animals such as deer, elephant, tiger, monkey, wild boar, rhinoceros, hippopotamus, cattle, pig, rabbit, and monkey. • It also includes a high number of reptilian and amphibian creatures such as tortoises and alligators, aquatic animals such as sharks and sting rays, and birds like peacocks.
<p>Tanpura/Tambura</p>	<p>Context: Beleaguered tanpura makers get some support from the Indian Council for Cultural Relations.</p> <ul style="list-style-type: none"> • Traditional makers of classical Indian string instruments worry about the extinction of their art, with little interest among the younger generation, and most of their clientele now based abroad. <p>About Tanpura/Tambura:</p> <ul style="list-style-type: none"> • The tanpura, also referred to as tambura and tanpuri, is a long-necked plucked string musical instrument, originating in India. • It does not play melody, but rather supports and sustains the melody of another instrument or singer. • A tanpura is not played in rhythm with the soloist or percussionist. • Hindustani musicians favour the term tanpura whereas Carnatic musicians say tambura. • Tanpuras are designed in two different styles: <ol style="list-style-type: none"> I. Miraj style: This is the favourite form of tanpura for Hindustani performers. II. Tanjore style: This is a south Indian style of tambura, used widely by Carnatic performers. <p>About Indian Council for Cultural Relations:</p> <ul style="list-style-type: none"> • The Indian Council for Cultural Relations (ICCR), is an autonomous organisation of the Government of India. • It is involved in India’s global cultural relations, through cultural exchange with other countries and their people. • It was founded in 1950 by Maulana Abul Kalam Azad, the first Education Minister of independent India. • Headquarter: New Delhi. • The council also operates missions internationally, with established cultural centres in various countries. • In addition to organising cultural festivals in India and overseas, the ICCR financially supports a number of cultural institutions across India, and sponsors individual performers in dance, music, photography, theatre, and the visual arts. • It also administers the Jawaharlal Nehru Award for International Understanding, established in 1965, whose last award was in 2009.
<p>Meitei script</p>	<p>Context: The script, once patronised by Meitei rulers but which fell into disuse with the advent of Hinduism and eventually disappeared, is now enjoying a new lease of life after a decades-old movement for its revival.</p> <p>About the Meiteilon script:</p>



- The Meiteilon (Manipuri language) script is fairly old.
- The earliest epigraphic record of the script is a stone inscription from Khoibu village which was erected on the orders of Meidingu Kiyamba (1467-1508).
- 'Meidingu' are kings who belong to the Ningthouja clan whose rule extends from 33 AD to 1949 AD.
- The Meitei Mayek or Meitei script evolved with time and this led to conflict between various proponents.
- The inscriptions on the coins of the 7th and 8th Century were perhaps in the 18-letter script, which, with the advent of Hinduism in the 17th century during the reign of Meidingu Pamheiba (1709-1748), was perhaps expanded to the 36-letter script.
- With the advent of Hinduism, Bengali scripts became so popular that stone inscriptions in the 18th and 19th century were in Bengali script.
- A movement to revive the Meitei Mayek started in the 1930s and gathered strength in the 1950s.
- By a Cabinet decision taken on May 18, 2005, Manipuri written in Meitei Mayek was introduced in schools and by now, it is taught even at the university level, replacing Bengali script.

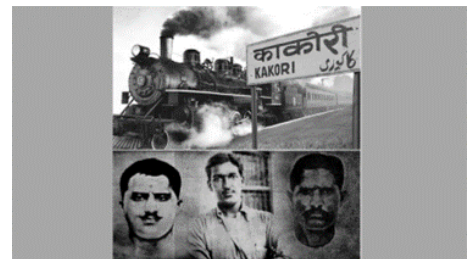
1925 Kakori Train Action

Context: Four revolutionaries of the Indian independence movement were hanged on December 17 (Rajendranath Lahiri) and December 19 (Ashfaqullah Khan, Ram Prasad Bismil, Thakur Roshan Singh) in 1927.

- This came two years after the Kakori Train Robbery, in which members of the Hindustan Republican Association (HRA) had looted a train transporting money to the British treasury.

About 1925 Kakori Train Action:

- The Kakori Conspiracy (or Kakori train robbery) was a train robbery that took place near Lucknow. The robbery was organized by Hindustan Republican Association (HRA).
- On 9 August 1925, the Number 8 Down Train travelling from Shahjahanpur to Lucknow was approaching the town of Kakori, when one of the revolutionaries pulled the emergency chain to stop the train and subsequently overpowered the guard.
- The target was the guard cabin, carrying money collected from various railway stations to be deposited in Lucknow. Revolutionaries looted only these bags (which contained more than 100,000 rupees) and escaped to Lucknow.
- Though no passengers were targeted by the revolutionaries, one passenger named Ahmed Ali was killed in the crossfire between the guards and revolutionaries. This made it a manslaughter case.
- The robbery plan was executed by Ram Prasad Bismil, Ashfaqulla Khan, Rajendra Lahiri, Chandrashekhar Azad, Swaran Singh, Sachindra Bakshi, Keshab Chakravarty, Manmathnath Gupta, Mukundi Lal, Banwari Lal, Kundan Lal, and Pranawesh Mukherjee.



- According to official records, 40 people were arrested during the trial.
- Most of these detainees were provided legal defense by Pandit Gobind Ballabh Pant, Mohanlal Saxena, Chandrabhanu Gupta, Ajit Prasad Jain, Gopinath Srivastava, R. M. Bahadurji and B. K. Chaudhury.
- Ram Prasad Bismil famously defended his own case.
- 5 members including Swaran Singh (Uncle of Bhagat Singh), Ram Prasad Bismil, Ashfaquallah Khan, Rajendra Lahiri and Roshan Singh were given sentence to death.
- The Urdu poem Sarfaroshi ki Tamanna was made popular by Ram Prasad Bismil during this time. This poem was actually written by Bismil Azimabadi following the Jallianwala Bagh massacre.
- Chandrashekhar Azad who could not be captured reorganized the HRA and ran the organization till 1931.

Goa Liberation Day

Context: President Droupadi Murmu tweeted her greetings to the nation on December 19, marking Goa Liberation Day, which is celebrated annually to mark the success of ‘Operation Vijay’ undertaken by the Indian armed forces to defeat Portuguese colonial forces and liberate Goa in 1961.

About Goa Liberation Day:


- December 18 and 19, 1961 saw a full-fledged military operation termed ‘Operation Vijay’, which was carried out with little resistance and an instrument of surrender was signed, leading to Goa’s annexation by India.

History of Goa:

- The Portuguese colonial presence in Goa began in 1510, when Alfonso de Albuquerque defeated the ruling Bijapur king with the help of a local ally, Timayya, and subsequently established a permanent settlement in Velha Goa (or Old Goa).
- During the Napoleonic Wars, Goa was briefly occupied by the British between 1812 and 1815.
- In 1843, the capital was moved to Panjim from Velha Goa.
- Portuguese colonial rule also saw the advent and growth of Christianity in Goa.

Goa’s Independence:

- By the turn of the twentieth century, Goa had started to witness an upsurge of nationalist sentiment opposed to Portugal’s colonial rule.
- Leaders such Tristão de Bragança Cunha, celebrated as the father of Goan nationalism, founded the Goa National Congress at the Calcutta session of the Indian National Congress in 1928.
- In 1946, the socialist leader Ram Manohar Lohia led a historic rally in Goa that gave a call for civil liberties and freedom, and eventual integration with India, which became a watershed moment in Goa’s freedom struggle.
- Post-1947, Portugal refused to negotiate with independent India on the transfer of sovereignty of their Indian enclaves.
- After Portugal became part of the US-led Western military alliance NATO (North Atlantic Treaty Organisation) in 1949, Goa too became part of the anti-Soviet alliance by extension.

	<ul style="list-style-type: none"> • Fearing a collective Western response to a possible attack on Goa, the Indian government continued to lay stress on diplomacy. • As India aggressively championed the Non-Aligned Movement, decolonisation, and anti-imperialism as pillars of its policy, the continuation of colonial rule in Portugal became increasingly unsustainable.
<p>Panini's 'Ashtadhyayi'</p>	<p>Context: Recently Cambridge scholar claimed to have solved Sanskrit's biggest puzzle—a grammar problem found in the 'Ashtadhyayi', an ancient text written by the scholar Panini towards the end of the 4th century BC.</p> <p>About Panini, the 'father of linguistics':</p> <ul style="list-style-type: none"> • Panini probably lived in the 4th century BC, the age of the conquests of Alexander and the founding of the Mauryan Empire. • He likely lived in Salatura (Gandhara), which today would lie in north-west Pakistan. • Panini was probably associated with the great university at Takasila, which also produced Kautilya and Charaka, the ancient Indian masters of statecraft and medicine respectively. <p>About Ashtadhyayi:</p> <ul style="list-style-type: none"> • 'Ashtadhyayi', or 'Eight Chapters' – is a linguistics text that set the standard for how Sanskrit was meant to be written and spoken. • Commentaries on Panini includes Mahabhasya of Patanjali (2nd century BC) and the Kashika Vritti of Jayaditya and Vamana (7th century AD).
<p>Betta-Kuruba tribe</p>	<p>Context: Recently the Lok Sabha passed the Scheduled Tribes (Fourth Amendment) Bill, 2022 to include Betta-Kuruba on the Scheduled Tribes list.</p> <p>About Betta kurubas:</p> <ul style="list-style-type: none"> • The Betta Kuruba (Betta meaning 'Hill', Kuruba meaning 'shepherd') tribe lives in the hilly regions of Karnataka, and is one of the few indigenous communities of the Nilgiris. • Traditionally, the Kuruba people drew sustenance from hunting, gathering and collecting wild honey. • Due to relocation, the Betta Kuruba people are being forced to give up their traditional livelihood, and work as agricultural labourers in coffee, spice (such as pepper, ginger, cardamom) and tea plantations. • They speak Betta Kurumba language which is a Dravidian language closely related to Tamil. • They are generally believed to be the descendants of the Pallavas. • Consanguineous marriages like cross-cousin marriages are preferred among the Kurumbas.
<p>Srisailem Temple</p>	<p>Context: Recently, President of India has inaugurated the project development of Srisailem Temple in the State of Andhra Pradesh.</p> <p>About the Temple:</p> <ul style="list-style-type: none"> • It is also known as Bhramaramba Mallikarjuna Temple. • It is situated in Srisailem, Nandyal district, Andhra Pradesh. 

- The temple is located on the top of the Nallamala hills and on the banks of River Krishna.
- It is dedicated to Lord Shiva and his consort Goddess Parvati.
- It is the only temple in India significant to both Saivism and Shaktism.
- The presiding deity of the place is Goddess Brahmaramba devi and Lord Mallikarjuna Swamy in natural stone formations in the shape of Lingam.
- The idol of deities is thought to be 'Swayambhu' or self-manifested.
- It is considered as one of the 12 Jyotirlingas of Lord Shiva and one of the 18 Maha Shakti Peethas of the Goddess, Parvati.

History of Srisailam Temple:

- Mention of Srisailam Temple is present in Nasik inscription of the Satavahana King Vasisthiputra Pulumavi in the 1st century AD.
- Reddy kings- Prolay Vemma and Anavema Reddy constructed pathways and Mandaps in the temple.
- The modern additions to the temple were made during the reign of Harihara I of the Vijayanagara Empire.

Architecture of Mallikarjun Temple:

- The temple is built in the Dravidian style.
- It has lofty towers and sprawling courtyards.
- Temple of Tripurantakam, Siddavatam, Alampura and Umamaheswaram are located in vicinity of Mallikarjuna Jyotirlinga as four gateways to Sri Sailam.

National Archives of India

In News: The National Archives of India (NAI) does not have records of 1962, 1965, and 1971 wars, or even of the Green Revolution.

- There are in all 151 ministries and departments, and the NAI has only records of 64 agencies – several Union ministries and departments have not shared their records with NAI

NAI:

- The NAI functions under the Ministry of Culture.
- It is the repository of all non-current government records, holding them for the use of administrators and scholars.
- Originally established as the Imperial Record Department in 1891 in Calcutta, the capital of British India, the NAI is now located in Delhi.
- It keeps and conserves records of the government and its organisations only, and does not receive classified documents.
- The holdings in NAI are in a regular series starting from the year 1748, and the languages of the records include English, Arabic, Hindi, Persian, Sanskrit and Urdu.
- Lately, NAI has also made efforts to make available all the records digitally – on the newly created Abhilekh Patal portal.

How it receives documents:

- As per the Public Records Act, 1993, various central ministries and departments are supposed to transfer records more than 25 years old to the NAI, unless they pertain to classified information.

- However, it is up to the respective ministries and departments to ascertain what is classified information, and that is where subjective opinions may kick in.
- Various ministries and administrations come up with their own definitions of what is classified and what is non-current.

Sri Guru Gobind Singh

In News: The Prime Minister, Shri Narendra Modi has paid tributes to Sri Guru Gobind Singh Ji on the sacred occasion of Parkash Purab of Sri Guru Gobind Singh.

Sri Guru Gobind Singh:

- Guru Gobind Singh was (January 5, 1671 – 21 October, 1708) born “Gobind Rai” at Patna Sahib, Bihar, India
- He was the tenth and last of the Gurus of Sikhism.
- He became Guru at the age of nine, following the martyrdom of his father, the ninth Guru, Guru Tegh Bahadur (killed by Aurangzeb).



Contributions:

- He was a divine messenger, a warrior, a poet, and a philosopher.
- He moulded the Sikh religion into its present shape with the institution of the Khalsa fraternity in 1699.
- He completed the Guru Granth Sahib Ji, in the final form that we find today.
- Before leaving his mortal body, Guru Gobind Singh decreed the Guru Granth Sahib as the next and perpetual Guru of the Sikhs.
- He is variously revered as Sarbans Dani (the merciful donor, who sacrificed his all), Mard Agamra (man without any parallels), Shah-e-Shahenshah (emperor of emperors), Bar do Alam Shah (ruler of both worlds), amongst others.
- He was a linguist familiar with Persian, Arabic, and Sanskrit as well as his native Punjabi.
- He further codified Sikh law, wrote martial poetry and music, and was the reputed author of the Sikh work called the Dasam Granth (“Tenth Volume”).
- The autobiography of Guru Gobind Singh is called Vichitra Katha.


Malik Ahmed and Ahilyabai Holkar



Context: Maharashtra Education Minister told the Legislative Council that he has sought a proposal from the district administration to rename the Western Maharashtra city of Ahmednagar as ‘Punyashlok Ahilyadevi Nagar’, after the 18th century Malwa queen, Ahilyabai Holkar.



About Ahilyabai Holkar:

- She was born in Chondi village of Ahmednagar to the village head Mankoji Shinde, 1725,
- Ahilyabai took control of Malwa after her husband’s death in the Battle of Kumbher against the king of Bharatpur in 1754.
- During her reign, Malwa was never once attacked.

	<ul style="list-style-type: none"> • Under Holkar, the city of Maheshwar became a literary, musical, artistic and industrial centre, and she helped establish a textile industry there, which is now home to the famous Maheshwari saris. <p>Restoration of Hindu temples:</p> <ul style="list-style-type: none"> • In 1780, she had the Kashi Vishwanath temple in Varanasi rebuilt, nearly a century after Mughal king Aurangzeb ordered its destruction. • Apart from holy sites like Badrinath, Dwarka, Omkareshwari, Gaya, and Rameswaram, Holkar also supported the construction of resting lodges for travellers, and of public ghats. <p>About Malik Ahmad Nizam Shah:</p> <ul style="list-style-type: none"> • In 1486, Malik Ahmad Nizam Shah became the Bahamani Sultanate’s Prime Minister. • He fought back an attempt by the king to dislodge him from power, and defeated the army of the Bahamani kingdom near Ahmednagar in May 1490. • In 1494 he laid the foundation of a city close to where he defeated the army, on the left bank of Sina river, and named it after himself it as Ahmednagar. • Ahmednagar lies in the Western region of Maharashtra. • After some time, Ahmednagar (then known as Nizamshahi) became one of the five independent kingdoms to emerge from Bahamani kingdom.
<p>Muhammad Iqbal</p>	<p>Context: Recently complaint was filed by Vishwa Hindu Parishad (VHP) against principal of a government school and shiksha mitra for hurting religious sentiments by recitation of the prayer ‘Lab Pe Aati Hai Dua’ written by Muhammad Iqbal.</p> <p>About Muhammad Iqbal:</p> <ul style="list-style-type: none"> • He was born to a family with Kashmiri Pandit ancestry that had embraced Islam in the 17th century. • He was born in Sialkot, Punjab (now in Pakistan). • He was commonly referred to as Allama (title given to Islamic scholars). • As a lawyer he appeared at the Lahore High Court in several cases. • He was knighted by King George V who gave him the title of “Sir” in 1922. • He died in Lahore at the age of 60 years. • His tomb is located in Hazuri Bagh in Lahore.  <p>Political career and Ideology:</p> <ul style="list-style-type: none"> • In his later life, he supported the idea of a separate nation for Muslims. • He was influenced by Muhammad Ali Jinnah’s vision of a separate nation of Pakistan. <p>Prominent works:</p> <ul style="list-style-type: none"> • He wrote the Urdu ghazal ‘Sare Jahan se Achcha Hindostan Hamara’. • His first book, Asrár-I Khudí (The Secrets of the Self), was published in 1915 • It was followed by Ramuz-e-Bekhudi (The Mysteries of Selflessness) in 1918 • These are regarded as the base for his poetic philosophy.
<p>Dhanu Yatra</p>	<p>Context: The ‘Dhanu Yatra’ festival, the largest open-air theatre festival began after a gap of two years, at Bargarh in the state of Odisha.</p> <p>About Dhanu Yatra:</p>

	<ul style="list-style-type: none"> • It came into existence in Bargarh in 1947-48 as part of celebrating country's Independence. • It is held annually for 7-11 days. • It is performed at the end of the harvesting of paddy which is the major crop of the region. • The plays in the festival starts with dethroning of Emperor Ugrasen of Mathura by Kansa over the marriage of his sister Devaki with Vasudev. • It concludes with the death of demon king Kansa and restoration of the throne to Ugrasen. • The Jeera River represents the Yamuna during the Dhanu Yatra celebration when the entire Bargarh municipal limits, spread over 5 sq km, turns into a stage and every citizen plays a role. • The river was once considered the lifeline of Bargarh.
<p>Tel Tsaf</p>	<p>Context: Recently, new archaeological findings from Tel Tsaf of Israel have shown the presence of cotton fibres originating from Indus Valley from 5200 BCE, or 7,200 years ago.</p> <p>About the findings:</p> <ul style="list-style-type: none"> • Tel Tsaf, a Middle Chalcolithic site, is located in the central Jordan Valley. • Cotton fibres found at Tel Tsaf are younger than the cotton strings found at Mehrgarh. • Cotton fibres and other bast fibres discovered are dyed with multiple colours that indicates complex social activities in the region. • Excavations unearthed has four architectural complexes where each consists of a closed courtyard with round or rectangular rooms and numerous rounded silos. • Burials were found within or adjacent to silos. 
<p>Srimukhalingam temple</p>	<p>In News: Union government has urged UNESCO to include Srimukhalingam temple in the world heritage list.</p> <p>About temple:</p> <ul style="list-style-type: none"> • The Srimukhalingam temple is also known as Kalinganagaram. • It was the capital of the early Eastern Ganga Dynasty. • Located in Jalumuru mandal of Srikakulam district Andhra Pradesh, near Vamsadhara River. • Constructed in the 9th century CE , it is built in the Kalinga architectural style. • Dedicated to lord Srimukha Lingeswara (a form of Shiva). • Here, Shiva Lingams do not have facial carvings and hence the temple differs from other shiva temples. • It is also known as Dakshina Kaasi. • It is believed that visiting this temple and taking a dip in the river relieves one from the cycle of rebirth. 



GEOGRAPHY

**Coastal Red Sand Dunes/Erra Matti Dibbalu**

Context: Recently Scientists urged Andhra Pradesh govt. to protect glacial-period coastal red sand dunes of Vizag.

This site needs to be protected to study the impact of climate change as Erra Matti Dibbalu have seen both the glacial and the warm periods.

About Coastal Red Sand Dunes/Erra Matti Dibbalu:**Formation of Erra Matti Dibbalu:**

- Formed around 12,000 years ago due to sea-land interaction.
- Comprises a mixture of sand (40-50%), silt and clay (another 50%) with oxidation imparting the unique red colour.

Significance of Erra Matti Dibbalu:

- They are geologically important as they represent the geological history of the late Quaternary period and carry the imprints of the fall of sea level and its subsequent rise, the impact of climate, monsoon and geological processes on the sediments.
- They are anthropologically and archeologically important as they possibly contain mesolithic and neolithic cultural materials as well.

Recognition of Erra Matti Dibbalu:

- It was recognised as a national geo-heritage site in 2014 and as a protected site by the Andhra Pradesh Government in 2016.
- Other Similar Place: The only other place in the country to have a similar stretch of red sand dunes is Tamil Nadu, which has the Teri dune complex.

About Geological Survey of India:

- The Geological Survey of India (GSI) is a scientific agency of India.
- It was founded in 1851, is a Government of India Ministry of Mines organisation, one of the oldest of such organisations in the world and the second oldest survey in India after Survey of India (founded in 1767), for conducting geological surveys and studies of India.
- The main functions of the GSI relate to creation and updating of national geo-scientific information and mineral resource assessment.
- It is headquartered in Kolkata and has six regional offices located at Lucknow, Jaipur, Nagpur, Hyderabad, Shillong and Kolkata. Every state has a state unit.
- 1951 M. S. Krishnan becomes the first Indian to be a Director of the Geological survey of India.

Cold Wave

Context:

Recently Indian Metrological Department (IMD) forecasted severe cold wave conditions in some parts of Punjab, Haryana, Chandigarh, Delhi, north Rajasthan, Himachal Pradesh and Uttarakhand.

Criteria for Cold Wave by IMD:

- A cold wave is declared when the minimum temperature is 10 degrees Celsius or below and is 4.5 degrees Celsius (C) less than normal for two consecutive days.
- A "severe" cold day is when the maximum temperature is at least 6.5 notches below normal.

Impact on human health:

- It varies from Cough and cold, bronchitis and respiratory diseases, Blood pressure issues, Skin problems, and even Bone, joint, and muscle pain due to lack of sunlight.

Factors responsible for cold wave in India:

- Build-up of a ridge (an extended area of relatively high atmospheric pressure) in the jet stream over northwest Asia.
- Movement of cold air masses in response to steering by upper-level winds.
- Formation of surface high-pressure over north & central India.
- Triggering mechanism like a strong westerly wave approaching northwest India to enhance winds for transport cold air south eastward.
- Extensive snow covers over northwest Himalayas.

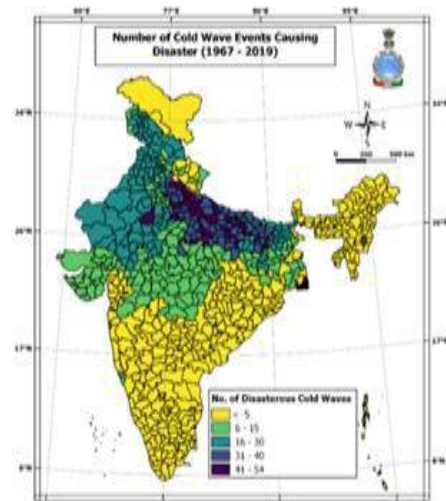


Fig.2 Number of Cold wave events causing disaster 1967-2019 (Source - IMD, New Delhi)

Fiji

Context: Recently Former military commander and Two-time coup leader Sitiveni Rabuka took oath as Fiji's Prime Minister.

About Fiji:

- It is a part of Oceania.
- It was a British colony for almost one hundred years from 1874.
- It gained independence in 1970.
- Capital: Suva
- Main Rivers: The Rewa, Navua, Sigatoka (Singatoka), and Ba (Mba).
- Highest Peak: Tomanivi (Mount Victoria) with 4,344 feet (1,324 metres).
- UNESCO's world heritage site: Levuka Historical Port Town.
- Its largest island is called Viti Levu.
- It surrounds Koro Sea, north of Auckland, New Zealand.



	<ul style="list-style-type: none"> • These islands are largely formed through volcanic action, sedimentary deposit, and formations of coral.
<p>Cactus Plantation and its Economic Usage</p>	<p>Context: Recently Union Minister of Rural Development and Panchayati Raj convened a consultation meeting on ‘Cactus Plantation and its Economic Usage’.</p> <ul style="list-style-type: none"> • Various options for taking up Cactus plantation on degraded land for realising the benefits of its usage for bio-fuel, food and bio-fertiliser were discussed in the meeting. • India has approximately 30% of its geographical area under the category of degraded land. <p>About Cactus:</p> <ul style="list-style-type: none"> • A cactus is a member of the plant family Cactaceae. • Although some species live in quite humid environments, most cacti live in habitats subject to at least some drought. • Many live in extremely dry environments, even being found in the Atacama Desert, one of the driest places on Earth. • Because of this, cacti show many adaptations to conserve water. • For example, almost all cacti are succulents, meaning they have thickened, fleshy parts adapted to store water. • Unlike many other succulents, the stem is the only part of most cacti where this vital process takes place. • Most species of cacti have only spines, which are highly modified leaves. • Spines help prevent water loss by reducing air flow close to the cactus and providing some shade. • In the absence of true leaves, cacti’s enlarged stems carry out photosynthesis. <p>Conservation:</p> <ul style="list-style-type: none"> • All cacti are included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). • Some cacti, such as all Ariocarpus and Discocactus species, are included in the more restrictive Appendix I. <p>Uses:</p> <ul style="list-style-type: none"> • Cactuses are known for their nutrients as well as their medicinal value. • Both cactus pads and cactus fruit can help fight infections and ease the symptoms of anything from hangovers to high cholesterol. • Both the cactus pad and the cactus fruit are high in fiber, which can lower cholesterol levels in the blood. • used as ornamental plants • used for fodder or forage, • Cactus fruits in particular are an excellent source of vitamin C, which is one of the best immune boosters.



- Nutrition: Cactus fruits and pads offer a dose of vitamins and nutrients that have anti-inflammatory properties and can help reduce the risk of serious health conditions like diabetes and heart disease.

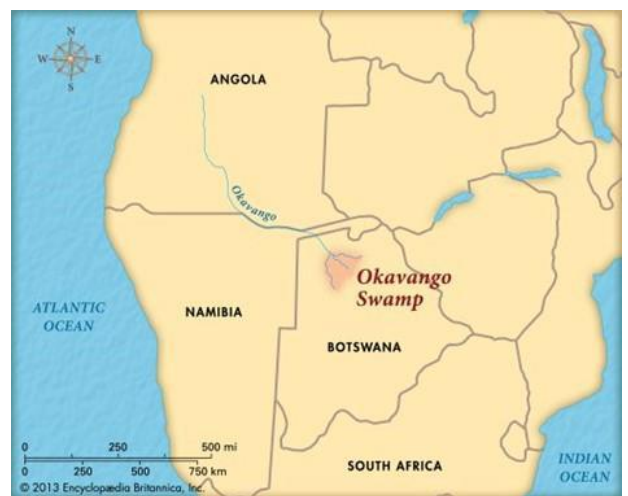
Okavango delta and Murchison Falls

In news: Oil companies are threatening two of Africa’s most iconic biodiversity hotspots in an effort to drill for oil that will ultimately make its way to a global elite and won’t benefit Africans, a recent report by a German non-profit has highlighted.

- The impact of the oil exploration projects being pursued in both locations could ring the death-knell for wildlife and render communities living there homeless.
- ReconAfrica, a Canadian company, has been drilling for oil in the Kavango Zambezi Transfrontier Nature Conservation Area (KAZA).

Okavango delta:

- The Okavango delta is a UNESCO World Heritage Site
- It is in Botswana.
- It is homeland of indigenous people like the San.
- It is formed by the Okavango river – originates in the highlands of Angola.
- The river flows into the Kalahari Desert of southern Africa and spreads out, forming what is called a ‘fan’.
- It is one of the very few major interior delta systems that do not flow into a sea.
- This delta comprises permanent marshlands and seasonally flooded plains.

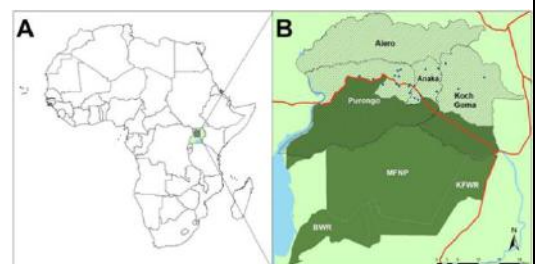


Importance of Okavango delta:

- The Okavango’s waters make the otherwise dry area a waterlogged wetland that provides vital water resources for animals, plants and over one million people.
- It is home to Africa’s Big Five wildlife species: Savanna elephants, Cape buffaloes, rhinos, lions and leopards.
- There are also giraffes, zebras, antelopes, pangolins, 400 bird species and over 1,000 plant species.
- More than 200,000 people live in the area that falls under Recon Africa’s exploration licenses.

Murchison Falls:

- It is Uganda’s oldest and largest national park,
- It is home to iconic African wildlife species.
- It is situated on the northern shore of Lake Albert, one of the Rift Valley Great Lakes that lies on the border between



Uganda and the Democratic Republic of Congo.

- The River Nile flows through the park and elephants, hippos, Nile crocodiles, buffaloes and marabou storks can regularly be seen on its banks.

Kavango Zambezi Transfrontier Nature Conservation Area (KAZA):

- KAZA is the second-largest nature and landscape conservation area in the world.
- It is spread across the borders of Angola, Botswana, Namibia, Zambia and Zimbabwe.



About Botswana:

- Capital – Gaborone
- It is a landlocked country in Southern Africa.
- Its 70% territory is covered by Kalahari Desert.
- Botswana has the world’s largest elephant population, estimated to be around 130,000.
- It is Africa’s oldest continuous democracy.

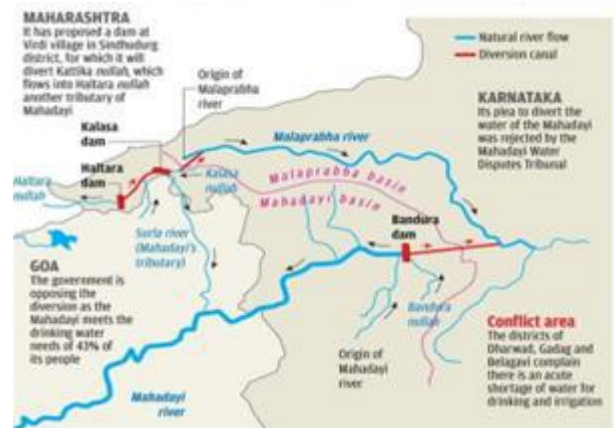
Kalasa-Banduri Project

Context: The Govt of India recently approved Karnataka’s Kalasa-Banduri drinking water project which is facing opposition from Goa and Maharashtra.

- The Central Water Commission (CWC) has cleared the diversion of 1.72 TMC of water from the Kalasa Dam and 2.18 TMC from the Bhanduri dam.

About Kalasa – Banduri Project:

- It is a dam that has been designed to divert water from the Mahadayi basin to the deficit basin of the Malaprabha River.
- The plan is aimed at facilitating drinking water for 13 towns in drought-hit northern Karnataka. These areas include Dharwad, Belagavi, Bagalkot and Gadag among others.



About Mahadayi River:

- The Mahadayi river rises in Karnataka (Western Ghats) from the Bhimgad Wildlife Sanctuary in Khanapur taluk of Karnataka’s Belagavi district.
- Flowing westward, it enters the north Goa districts.
- Several streams join the flow of the river to form the Mandovi which is one of two major rivers that flow through Goa.
- It joins the Arabian Sea at Panaji.
- Distribution: Of the total area, 375 sq km lies in Karnataka, 77 sq km in Maharashtra and remaining 1580 sq km is in Goa.

About Central Water Commission (CWC):

- Central Water Commission is a premier technical Organization of India in the field of Water Resources and is presently functioning as an attached office of the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Government of India.
- The Commission is entrusted with the general responsibilities of initiating, coordinating and furthering in consultation of the State Governments concerned, schemes for control, conservation and utilization of water resources throughout the country, for purpose of Flood Control, Irrigation, Navigation, Drinking Water Supply and Water Power Development.
- It also undertakes the investigations, construction and execution of any such schemes as required.
- Central Water Commission CWC is headed by a Chairman, with the status of Ex-Officio Secretary to the Government of India.
- The work of the Commission is divided among 3 wings namely, Designs and Research (D&R) Wing, River Management (RM) Wing and Water Planning and Projects (WP&P) Wing.

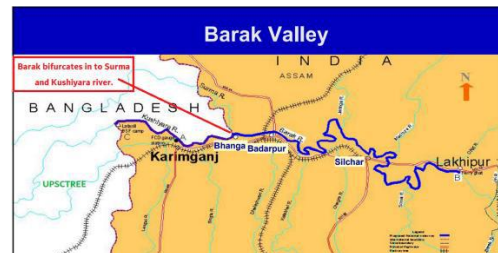
Barak River

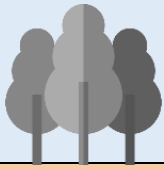
In News: The assured depth dredging work of river Barak from Badarpur to Bhanga (10.5 km) has been awarded to Dredging Corporation of India.

- Funds have been disbursed by the World Bank to improve the waterways in Assam.

Barak River:

- Barak River is one of major rivers of South Assam.
- It rises in Manipur. After Manipur it flows through Mizoram and Assam.
- The 564 kilometres long river is part of Surma-Meghna River System.
- It later enters Bangladesh where it splits into Surma and Kushiya rivers.
- The principal tributaries of Barak are the Jiri, the Dhaleswari, the Singla, the Longai, the Sonai and the Katakhal.
- The Barak sub-basin drains areas in India, Bangladesh and Burma.
- The drainage area lying in India is 41723 sq.km which is nearly 1.38% of the total geographical area of the country.
- The sub-basin lies in the States of Meghalaya, Manipur, Mizoram, Assam, Tripura and Nagaland.





ENVIRONMENT



Monkeypox/mpox

Context: The World Health Organisation (WHO) recently announced that it would start using the term “mpox” for monkeypox, which has infected about 80,000 people in the first major outbreak of the viral disease outside Africa that began early this summer. The disease spread mainly in the Americas including the United States and Europe, primarily among men who have sex with men (MSM).

About Mpox:

- It is a viral zoonotic disease that occurs primarily in tropical rainforest areas of Central and West Africa.
- Caused by monkeypox virus, a member of the Orthopoxvirus genus in the family Poxviridae.
- The clinical presentation of monkeypox resembles that of smallpox, a related orthopoxvirus infection which was declared eradicated worldwide in 1980.



Symptoms:

- Fever
- Rash and swollen lymph nodes
- Headaches and nausea

Transmission:

- Mostly transmitted to people from wild animals such as rodents and primates.
- Human-to-human transmission also occurs.
- Monkeypox virus is transmitted from one person to another by contact with lesions, body fluids, respiratory droplets and contaminated materials such as bedding.

Outbreaks:

- The first case of monkeypox was reported in 1958 in monkeys and in humans in 1970 in the western Africa.
- Nigeria witnessed the biggest outbreak of the disease in 2017.
- Thereafter, the disease has been reported in many countries including the USA, Singapore, UK.

Difference from smallpox:

- The main difference between symptoms of smallpox and monkeypox is that the latter causes lymph nodes to swell (lymphadenopathy) while smallpox does not.

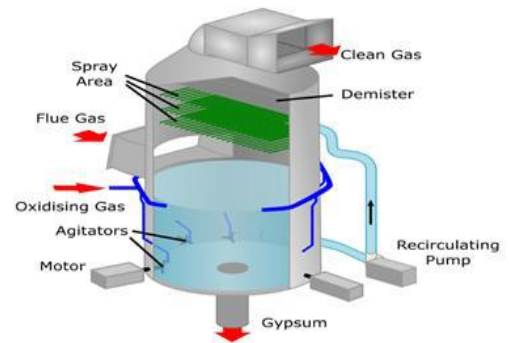
State of the Climate in Asia 2021 report

In news: The State of the Climate in Asia 2021 report published by the World Meteorological Organization (WMO) and the UN Economic and Social Commission for Asia and the Pacific (UNESCAP) has been released.

	<p>Findings of the report:</p> <ul style="list-style-type: none"> • India suffered a total loss of \$3.2 billion from floods and \$4.4 billion from storms in 2021 as climate change has made these events more frequent. • During 2021, India experienced five cyclonic storms with maximum sustained wind speeds of ≥ 34 knots • Extremely severe cyclonic storm Tauktae (May) formed over Arabian Sea during pre-monsoon season was the most devastating. • Severe Cyclonic Storm Yaas (May) hit West Bengal and northern Odisha, causing damages worth Rs 20,000 crore and Rs 600 crore, respectively. • Cyclone Gulab (September) landed on the Andhra Pradesh and Odisha coasts, accumulated damages to the tune of Rs 2,000 crore. • Cyclone Shaheen was formed from the remnants of Gulab and caused heavy rainfall in Gujarat. • Cyclonic Storm Jawad, causing heavy rainfall over the eastern coast. • Thunderstorms and lightning claimed around 800 lives in the country. • India was only second to China in Asia. China suffered the highest economic loss in Asia (\$18.4 billion) after flooding. • Floods and storms accounted for 80 per cent of the natural disasters that struck Asia in 2021. • Ocean warming could contribute to sea level rise, alter storm paths and ocean currents and increase stratification, the report warned. • Upper-ocean warming is important because it directly affects the atmosphere in terms of convection, winds, cyclones etc. • The deep ocean does not affect the atmosphere directly • Warming is particularly strong in the Arabian Sea because it has pathways to receive excess heat through atmospheric tunnels and bridges. Mixed warm water from various oceans is pumped into it. • These regions are warming more than three times faster than the global mean upper-ocean warming rate • Kuroshio Current takes warm water from the tropics and stronger winds force more heat into the current. • Excessive rainfall due to La Nina – During this time, the pressure patterns set up in India go from North to South, which drives circulations from Eurasia and China. • Northeast monsoon rainfall experienced over southern peninsular India during the northeast monsoon was exceptionally above normal (171 per cent of the long-term average) and was the highest (579.1 millimetre) since 1901.
<p>Climate Investment Opportunities in India's Cooling Sector report: World Bank</p>	<p>Context: According to the report, "Climate Investment Opportunities in India's Cooling Sector" which was released by the World Bank from 2030 onwards, more than 160 to 200 million people could be exposed to a lethal heat wave in India every year, and around 34 million Indians will face job losses due to heat stress-related productivity decline.</p> <p>Key findings of the report:</p> <ul style="list-style-type: none"> • By 2037, the demand for cooling is likely to be eight times more than the current level, the World Bank has said in a report.

	<ul style="list-style-type: none"> • In this scenario, it is imperative for India to deploy alternative and innovative energy efficient technologies for keeping spaces cool. • According to the report, it could open an investment opportunity of \$1.6 trillion by 2040, besides reducing greenhouse gas emissions significantly and creating 3.7 million jobs. • With the demand for cooling shooting up, there will be a demand for a new air-conditioner every 15 seconds, the report said, leading to an expected rise of 435% in annual greenhouse gas emissions over the next two decades. <p>Criterion for declaring heat waves in India:</p> <ul style="list-style-type: none"> • Heat wave is considered if the maximum temperature of a station reaches at least 40°C or more for Plains and at least 30°C or more for Hilly regions. • If the normal maximum temperature of a station is more than 40°C, then an increase of 4°C to 5°C from the normal temperature is considered to be heat wave condition. • Further, an increase of 6°C or more is considered a severe heat wave condition.
<p>State of Finance for Nature report</p>	<p>Context: According to a new United Nations (UN) report, Financing for nature-based solutions (NbS) needs to be doubled to deal with multiple global crises of climate change, biodiversity loss and land degradation.</p> <p>About the report:</p> <ul style="list-style-type: none"> • The report was released by the UN Environment Programme (UNEP) along with the Economics of Land Degradation initiative of the Federal Ministry for Economic Cooperation and Development (BMZ) of Germany, the United Nations Convention to Combat Desertification (UNCCD) and the European Commission. <p>Key findings of the report:</p> <ul style="list-style-type: none"> • The key focus should be on doubling finance flows to NbS and reducing it for activities that increase greenhouse gas (GHG) emissions. • According to the report, the current global investments in NbS are around \$154 billion (Rs 12,49.44 crore) per year, which needs to be increased to \$384 billion by 2025. • “Harmful subsidies are highest in the energy sector, estimated to range from \$340 billion/ year to \$530 billion/year and in the agriculture sector, estimated around \$500 billion/year,” estimated the report. • The report recommended the phase-out of these investments. • Another highlight of the report was the need for private investments in nature-based solutions, which currently stands at only 17 per cent. • Private actors can combine Net Zero with nature positive, the report suggested.
<p>Flue Gas Desulphurisation</p>	<p>Context: According to study conducted by Centre for Research on Energy and Clean Air (CREA), since December 2015 , not one single power station in West Bengal has installed Flue Gas Desulphurisation (FGD) technology to reduce SO2 emissions.</p> <ul style="list-style-type: none"> • The emission standards were notified for the first time in December 2015 in India for coal-based power stations to limit emissions of sulphur dioxide (SO2), nitrogen oxides (NOx), and mercury (Hg), along with tightening particulate matter emissions standards and setting water consumption limits. <p>About Flue Gas Desulphurisation (FGD):</p>

- Flue-gas desulfurization (FGD) is a set of technologies used to remove Sulphur dioxide (SO₂) from exhaust of fossil-fuel power plants.
- **Flue gas** is the gas exiting to the atmosphere via a flue, which is a pipe or channel for conveying exhaust gases from a fireplace, oven, furnace, boiler or steam generator.
- FGD systems may involve wet scrubbing or dry scrubbing.
- In wet FGD systems, flue gases are brought in contact with an absorbent, which can be either a liquid or a slurry of solid material. The Sulphur dioxide dissolves in or reacts with the absorbent and becomes trapped in it.
- In dry FGD systems, the absorbent is dry pulverized lime or limestone; once absorption occurs, the solid particles are removed by means of baghouse filters.



About Sulphur dioxide:

- It is an inorganic compound, heavy, colourless, and poisonous gas.
- It has a pungent, irritating odour, similar to the smell of a just-struck match.
- In nature, it occurs in volcanic gases and in a solution of some water warm springs.
- Usually, it is prepared industrially by the burning in air or
- In large quantities, sulphur dioxide is formed in the combustion of sulphur-containing fuels.
- It can combine in the atmosphere with water vapour to form sulphuric acid which is a major component of acid rain.

Sulphur Dioxide uses are:

- It is used in the preparation of sulphuric acid, sulphur trioxide, and sulphites.
- It is also used as a disinfectant.
- It is used in a refrigerant, a reducing agent, a bleach, and food preservation mainly in dried fruits.

Sulphur Dioxide (SO₂) and Air Pollution:

- SO₂ emissions are a significant contributor to air pollution. High concentrations of SO₂ in the air generally lead to the formation of other Sulfur Oxides (SO_x).
- SO_x can react with other compounds in the atmosphere to form small particles. These particles contribute to Particulate Matter (PM) pollution.
- Small particles may penetrate deeply into the lungs and in sufficient quantity can contribute to health problems.
- The greatest source of SO₂ in the atmosphere is the burning of fossil fuels in power plants and other industrial facilities.
- Other sources include industrial processes such as extracting metal from ore, natural sources such as volcanoes, and locomotives, ships and other vehicles and heavy equipment that burn fuel with high sulphur content.

Zombie Virus'

In News: European researchers have raised concerns of yet another pandemic after resurrecting a 48,500-year-old 'zombie virus' from a frozen lake in Russia.

- Climate change-induced thawing of the permanent frozen land (permafrost) in the Arctic could pose a new public health threat.

About Zombie Virus:

- Zombie virus is the term given to a virus that is frozen in ice and therefore dormant.
- The virus emerged due to the thawing of permafrost as the global temperature is rising.
- It is a group of viruses which have been dormant for thousands of years.
- It is dubbed Pandoravirus yedoma after the mythological character Pandora which was 48,500 years old and has the potential to infect other organisms.
- It was discovered below the bottom of a lake in Yukechi Alas in Yakutia, Russia.

Major cause of Zombie Virus:

- One-quarter of the Northern hemisphere is underlain by permanently frozen ground which is referred to as permafrost.
- Due to climate warming, irreversibly thawing permafrost is releasing organic matter frozen for up to a million years and most of which decomposes into carbon dioxide and methane which further enhances the greenhouse effect.
- Part of this organic matter also consists of revived cellular microbes (prokaryotes, unicellular eukaryotes) as well as viruses that remained dormant since prehistoric times.

Bhopal Gas Tragedy

Context: According to the Sambhavna Trust, the leakage of 27 tonnes of deadly methyl isocyanate (MIC) gas from the pesticide plant owned by Union Carbide Corporation in Bhopal 38 years ago is still wreaking havoc on the city. The latest is the spike in incidences of fungal infection among survivors.

About Bhopal Gas Tragedy:

- In the early hours of December 3, 1984, methylisocyanate (MIC) gas leaked from a plant operated by Union Carbide India Limited (UCIL) at Bhopal (Madhya Pradesh).
- The final death toll was estimated to be between 15,000 and 20,000.
- Some half a million survivors suffered respiratory problems, eye irritation or blindness, muscular dystrophy and other maladies resulting from exposure to the toxic gas.
- The study found out that babies born to women exposed to gas were significantly more likely to have “congenital malformations” than those born to women unexposed to gas.

Government’s response to Bhopal Gas tragedy:

- The government passed the Bhopal Gas Leak Act in March 1985, which allowed it to act as the legal representative for victims.
- In June 2010, seven former employees of Union Carbide, who were all Indian nationals, were convicted of causing death by negligence and sentenced to two years of imprisonment. However, they were later released on bail.

Fungal Infections:

- Ringworm disease, caused by a fungus called tinea, is on the rise.

- Red itchy patches occur in the groin, on the head or in different places of the body. The rash spreads if left untreated.
- Yeast infection candida albicans is also being reported to the Sambhavna Clinic by female survivors.

About Methyl Isocyanate (MIC):

- Methyl isocyanate is a colourless highly flammable liquid that evaporates quickly when exposed to the air. It has a sharp, strong odour.
- It is used in the production of pesticides, polyurethane foam, and plastics.
- The chemical is highly reactive to heat. When exposed to water, the compounds in MIC react with each other causing a heat reaction.
- Immediate health effects include ulcers, photophobia, respiratory issues, anorexia, persistent abdominal pain, genetic issue, neuroses, impaired audio and visual memory, impaired reasoning ability, and a lot more.
- Long-term health effects include chronic conjunctivitis, decreased lung function, increased pregnancy loss, increased infant mortality, increased chromosomal abnormalities, impaired associate learning and more.

Mahua Tree/Madhuca longifolia

Context: Mahua tree is an integral part of the people of Munda tribe. Mundas are the central Indian tribe of Chota Nagpur region.

The Munda people’s association with the mahua tree begins even before they are born. Would-be mothers are fed a simple chutney made of mahua flowers that is believed to be healthy.

- Mahua is also a part of wedding rituals and mahua liquor is served at the ceremony. From birth, through marriage, till funeral — mahua is intertwined with their cultural life.

About Mahua Tree:



- The Madhuca longifolia is a species of tropical tree native to India that may be found primarily on the plains and forests of the central, southern, and northern parts of the country, as well as in Nepal, Myanmar, and Sri Lanka.
- It is a quick-growing tree that may reach a height of roughly 20 metres, with everlasting or semi-evergreen foliage.
- It grows sporadically in semi-evergreen woods, along riverbanks, and pastures and crop fields in central India.
- It has a short, thick trunk with a diameter of 80 cm.
- The crown has several branches and is circular.
- The basic leaf blade measures 10-25 cm in length and 6-12 cm in width, is oval-shaped, stiff, thick, and hard, woolly on the underside, and exudes a milky sap when broken.

Madhuca longifolia: Uses

- Several different portions of the tree, particularly the bark, are utilised for the therapeutic benefits they possess. Patients with diabetes in Nepal are given a decoction made from the tree's bark.
- mahua is omnipresent from food to fodder, dawa (medicine) to daaru (alcohol) in daily lives tribals of central India. In their own words, 'Mahua is not a tree, it's our way of life'.
- Leprosy is often treated using a medicinal extract made from the tree's bark.
- The oil that is extracted from the seeds is utilised in the treatment of a variety of skin conditions.
- The seed cakes that are left over after the oil has been extracted make for excellent fertiliser.
- The flowers are thought to provide a calming, tonifying, and demulcent effect. They are employed in the therapy of coughs, colds, and bronchitis, among other conditions.
- The succulent, sugary flowers can be consumed as fresh or dried, powdered and baked with flour, fermented to produce alcohol, or used as a sweetener.
- Given its non-toxicity, the inhabitants of Western Odisha rely heavily on mahua fruit as a primary source of nutrition.

Kunming-Montreal Global Biodiversity Framework.

Context -In 2022, at the 15th Conference of Parties (COP15) to the UN Convention on Biological Diversity delegates from 196 countries met in Montreal, Canada from December 7-21 with the aim to hammer out a new global agreement on halting environmental loss.

- The meeting in Montreal was the second part of COP15, the first part having been held in Kunming in China in 2021.
- In 2021, the Kunming Declaration was signed by more than 100 countries to ensure the development, adoption, and implementation of an effective global biodiversity framework.
- The theme of the declaration was Ecological Civilization: Building a Shared Future for All Life on Earth.
- COP 15 adopted the "Kunming-Montreal Global Biodiversity Framework". (GBF).

Major Outcomes of COP15:

- **30x30 Deal:** Restore 30% degraded ecosystems globally (on land and sea) by 2030
- Conserve and manage 30% areas (terrestrial, inland water, and coastal and marine) by 2030
- **Money for Nature:** Signatories aim to ensure USD200 billion per year is channelled to conservation initiatives, from public and private sources.
- Wealthier countries should contribute at least USD20 billion of this every year by 2025, and at least USD30 billion a year by 2030.
- **Big Companies Report Impacts on Biodiversity:** Companies should analyse and report how their operations affect and are affected by biodiversity issues.

- The parties agreed to large companies and financial institutions being subject to “requirements” to make disclosures regarding their operations, supply chains and portfolios.
- **Harmful Subsidies:** Countries committed to identify subsidies that deplete biodiversity by 2025, and then eliminate, phase out or reform them.
- They agreed to slash those incentives by at least USD500 billion a year by 2030 and increase incentives that are positive for conservation.
- **Monitoring and reporting progress:** All the agreed aims will be supported by processes to monitor progress in the future, in a bid to prevent this agreement meeting the same fate as similar targets that were agreed in Aichi, Japan, in 2010, and never met.
- National action plans will be set and reviewed, following a similar format used for greenhouse gas emissions under U.N.-led efforts to curb climate change.

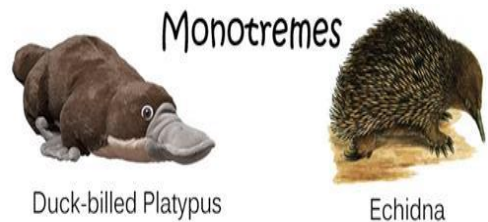
Gondwana ‘wellspring’ of mammalian evolution, not Laurasia: Research

Context: According to new research published recently, Mammals may have evolved in Gondwana, the southern landmass formed from the supercontinent Pangaea millions of years, rather than its northern counterpart Laurasia.

- Modern mammals consist of three sub groups: Monotremes, marsupials and placentals.

About Monotremes (The Egg-laying Mammals):

- Monotremes or Prototherians are egg laying (oviparous) mammals.
- They are the most primitive mammals. Currently, only three species of Monotremes are extant viz. Duckbilled Platypus and two species of Echidnas. Monotremes are found only in Australia and New Guinea.
- The word “monotreme” means “one opening” which denotes that Monotremes have only one cloaca that is used as anus, unitary tract as well as for reproduction.
- They lay egg which has leathery shell.
- The young ones get their milk from mammary glands found on mother’s belly. No nipples are found in Monotremes.
- While platypus lays eggs on bank of stream; echidnas lay a single egg in a temporary protective pouch on mother’s belly.
- Monotremes don’t have a placenta also.



Duck-billed Platypus

Echidna

About Marsupials (Metatheria):

- Marsupials include kangaroos, wallabies, koala, possums, opossums, wombats, numbat
- There are around 330 species of Marsupials distributed in three continents viz. Australia South America and North America (only two species are found north of Mexico).



Wallaby

Kangaroo

Tree Kangaroo

Koala

- Most (70%) are found Australia continent which includes Australia, New Zealand, New Guinea and neighbouring islands in the Pacific Ocean. Remaining is mostly found in South America and Central America.

Key Features:

- The term marsupium means a pouch. Marsupials give birth to a relatively undeveloped young, which often resides in the pouch with the mother for a certain time after birth. This also implies that they have a relatively short gestation.
- Marsupials have different ecological niches, ranging from moles to insect eaters to plant eaters.
- Most Marsupials are nocturnal and they have best sense of smell and hearing.
- Red Kangaroo is largest Marsupial of the world.

About Placentals (Eutheria):

- There are nearly 4000 described species in Placental mammals, of which most are rodents and bats.
- The Placental mammals give birth to live young. Before birth, the embryo is nourished in mother’s uterus via a specialized organ connected to uterus called placenta.



- We note that Marsupials also have a placenta but it is very short lived and does not make any substantial contribution in the nourishment of the foetus.

The placental animals have been divided into several orders as enumerated below:

- Artiodactyls are mammals with an even number of fingers in claws or paws like. These include cows, sheep and giraffes.
- Perissodactyls or ungulates (hooved), are large animals with an odd number of fingers on each paw, such as horses and rhinos.
- Carnivorous mammals are predators with canine teeth such as dogs, lions and tigers.
- Cetaceans are aquatic mammals without posterior limbs, such as whales and dolphins.
- Edentates are mammals with rare or absent teeth, such as sloths, armadillos and anteaters.
- Lagomorphs are small-sized mammals with three pairs of continuously growing incisor teeth specialized in gnawing, such as rabbits and hares.
- Primates are characterized by their large cranium and well-developed brain, such as humans and apes.
- Proboscideans are large animals whose nose and upper lip form a trunk (snout), such as
- Chiropterans are flying nocturnal mammals; this group includes bats.

- Rodents are animals with two pairs of continuously growing incisor teeth, such as mice, rats, beavers and squirrels.
- Sirenians are freshwater aquatic mammals lacking of posterior limbs, such as dugongs (Sea Cows) and manatees.

Nevada wildflower

Context: In the United States, wildlife officials declared a Nevada wildflower endangered at the only place it's known to exist – on a high-desert ridge where a lithium mine is planned to help meet the growing demand for electric car batteries.

About Nevada Wildflowers:



- Sierra Nevada meadows explode in the spring and summer with beautiful wildflowers.
- In English Meadow, the orange-red Indian paintbrush (genus *Castilleja*) grows amid tall, yellow-flowered arrowleaf ragwort (*Senecio triangularis*).
- Meadow wildflowers play an important role in the larger ecosystems of the Sierra Nevada.
- The flowers are a primary food source for insects, and insects are an important food source for bats and birds.

About Sierra Nevada:

- Sierra Nevada, also called Sierra Nevadas, major mountain range of western North America, running along the eastern edge of the U.S. state of California.
- Its great mass lies between the large Central Valley depression to the west and the Basin and Range Province to the east.
- Extending more than 250 miles (400 kilometres) northward from the Mojave Desert to the Cascade Range of northern California and Oregon, the Sierra Nevada varies from about 80 miles wide at Lake Tahoe to about 50 miles wide in the south.



	<ul style="list-style-type: none"> The Sierra Nevada range is an excellent example of how the human occupation and use of an area can modify its landscape.
Orans	<p>Context: Residents from around 40 villages of Jaisalmer, Rajasthan have walked 225 kilometres to protect community-conserved sacred spaces known as ‘orans’. Currently, the biodiversity hotspots are classified as wastelands.</p> <p>About orans:</p> <ul style="list-style-type: none"> ‘Orans’ are community forests that act as a store of biodiversity, enable effective water management and serve as a community based regeneration system, which also ensure sustainable extraction of Non-Timber Forest Produce (NTFPs) by villagers, in the world’s oldest Aravali Mountain Range and in the Great Indian Desert of Rajasthan. Sacred groves have been live manifestations of historical, cultural and emotional attachment of human beings with forests. They unify rural communities religiously, culturally and socially. In due course, degradation and depletion of forests and forest resources have occurred due to several reasons—both natural and anthropogenic.(India). There are about 25000 orans in Rajasthan that cover more than 600,000 hectares and provide a much-needed lifeline and safeguard to their respective communities. Until two decades ago, orans have suffered widespread degradation due to neglect and misguided priorities, opposition from hostile actors such as profit-seeking corporations, the introduction of foreign flora and fauna that compromise biodiversity and from a changing climate, all of which led to a marked decline in the condition of orans. Founded to address the above challenges, KRPAVIS, an organization of local people, has been working for 21 years to revive orans, both physically and conceptually, in the desert and Aravali regions. These orans are hotspots of biodiversity with trees and flowers like rohida, bordi, kumbhat, and desi babool in large numbers. There are different varieties of grasses like sevan and murath as well, making these grasslands home to more than 250 species of birds and animals, including the great Indian bustard, McQueen bustard, chinkara, Indian desert cat, desert fox, etc <p>About KRPAVIS:</p> <ul style="list-style-type: none"> Krishi Avam Paristhitiki Vikas Sansthan (KRPAVIS), literally means “organization for the development of ecology and agriculture/livestock”, works with a clear mission: the betterment of ecological, agricultural and livestock practices with a view to ensuring sustainable livelihoods for rural pastoral communities in Rajasthan.
Project Nilgiri Tahr	<p>Context: Recently the Tamil Nadu government launched an initiative for the conservation of the Nilgiri Tahr.</p> <p>About Nilgiri Tahr:</p>

- The species is locally known as Varaiaadu.
- There are multiple references to the Nilgiri Tahr in Tamil Sangam literature dating back to 2,000 years.
- The late Mesolithic (10,000-4,000 BC) paintings highlight the significance of the Tahr in folklore, culture and life.
- It was designated as the State animal of Tamil Nadu in recognition of its ecological and cultural significance.
- IUCN Status: It has been listed as an endangered species and is protected under Schedule-I of the Wildlife (Protection) Act of India, 1972.
- The animal inhabits meadows with steep cliffs at elevations between 300 metres and 2,600 metres above sea level.
- Population: It is estimated that there are 3,122 Nilgiri Tahrs in the wild.
- October 7 will be celebrated as 'Nilgiri Tahr Day' in honour of E.R.C. Davidar.
- He was responsible for pioneering one of the first studies on Nilgiri Tahr in 1975.



Asian Giant Tortoises

Context: Recently 10 Giant Asian Tortoise were soft released into protected area of Intanki National Park in Nagaland for conservation.

About Asian Giant Tortoises (*Manouria emys*):

- It comprise of two subspecies: *Manouria emys phayrei* and *Manouria emys emys*.
- They are largest tortoises in mainland Asia.
- They are the only tortoise that lays its eggs above ground in a nest, which the female constructs of leaf litter.



Habitat:

- Evergreen Forest, dry evergreen forest including bamboo forest.
- They are native to South Asia found in Bangladesh, India, Indonesia, Malaysia, Myanmar, Thailand and Singapore (Extinct).
- In India, the Nengpui Wildlife Sanctuary, North Cachar Hills and Nongkhylllem Wildlife Sanctuary have wild populations in less disturbed habitats.

Conservation Status:

- IUCN Red List: Critically Endangered
- CITES: Appendix II.
- Wildlife (Protection) Act of 1972: Schedule IV

Conservation Efforts:

- Nagaland and non-profits Turtle Survival Alliance and Wildlife Conservation Society conducted soft release of the juvenile tortoises to rewild the species.
- **Soft release:** It is a process of gradually releasing captive-raised species into the wild.
- It helps the species to develop site fidelity among released individuals and eventually develop the habit to live in the vicinity of the release closure.

Sand battery

Context: Recently a Finland based company came up with sand-based battery to provide clean energy solution for Europe’s energy crisis. It is currently operational at town of Kankaanpaa in Finland.

About Sand Battery:



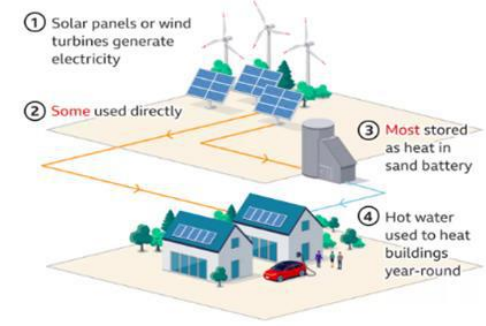
- It is a type of energy storage device that uses sand or sand-like materials as the storage medium.
- Sand is a very effective medium for storing heat and loses little over time.
- The sand is charged with electricity and then discharged to produce power.
- Its purpose is to work as a high-power and high-capacity reservoir for renewable energy.

- Sand batteries can help to increase the use of renewable energy by allowing excess/surplus energy produced from renewable sources to be stored and used at a later time.
- Steel silo: It contains 100 tonnes of sand where the heat is stored.

Working conditions:

- It receives electricity from grid through cheaper renewable sources like solar and wind.
- Electricity is converted to heat and transferred to sand.
- Air is blown via a fan through the curricular pipe system inside the silo.
- It will enter the electric air heater, where it becomes hot with the help of a resistor located inside.
- Hot air will be circulated by air-to-water heat exchanger through metal structure (pipes).
- There’s no direct contact between air and water.

How sand batteries work



Antarctica’s emperor penguins

Context: Greater conservation efforts are needed to protect Antarctic ecosystems, and the populations of up to 97 per cent of land-based Antarctic species could decline by 2100 including emperor penguins if we don’t change tack, a new research has found.

About Emperor Penguin:

- The emperor penguin is the tallest and heaviest of all living penguin species and is endemic to Antarctica.
- Like all penguins, it is flightless.
- Its diet consists primarily of fish, but also includes crustaceans.
- While hunting, the species can remain submerged around 20 minutes.
- It is the only penguin species that breeds during the Antarctic winter.



	<ul style="list-style-type: none"> • The lifespan is typically 20 years in the wild, although observations suggest that some individuals may live to 50 years of age. • IUCN status: Near threatened
<p>Dieback disease</p>	<p>In News: The disease posing a threat to the neem trees has been identified as twig blight and dieback disease in Telangana.</p> <p>Neem:</p> <ul style="list-style-type: none"> • Neem is a member of the mahogany family, Meliaceae. • Neem trees are attractive broad-leaved evergreens that can grow up to 30 m tall and 2.5 m in girth. • It is grown from the southern tip of Kerala to the Himalayan hills, in tropical to subtropical regions, in semiarid to wet tropical regions, and from sea level to about 700 m elevation. • Neem shows antibacterial, antifungal, and other versatile properties. <p>Dieback disease:</p> <ul style="list-style-type: none"> • The dieback disease affects leaves, twigs and the inflorescence of neem trees of all ages • It causes almost 100% loss of fruit production in severely infected trees • The dieback disease is mainly caused by the fungi <i>Phomopsis azedaraches</i>. • The appearance of symptoms starts with the onset of the rainy season and becomes progressively severe in the later part of the rainy season and early winter. <p>Control measures:</p> <ul style="list-style-type: none"> • The twigs affected by the disease should be cut and a blend of fungicide and insecticide can be sprayed after their removal. • Alternatively, a pit should be dug around an affected tree, and water mixed with fungicide and an insecticide should be poured into it.





SOCIETY & SOCIAL ISSUES

**Nomadic Malampadandram Tribe**

Context: An indigenous community called Malampadandram tribe is helping the authorities keep the forest roads clean at Sabarimala forests.

About Malampadandram Tribe:

- This is the name of a small, nomadic community living in the remote forest.
- Fishing and collecting fruits and other edibles from the forest are the main occupations of this community that depends on the forest for all their needs.
- The Malai Pandaram or otherwise termed as Hill Pandaram is a scheduled tribe.
- They are mainly distributed in the high range areas of Kollam and Pathanamthitta Districts.
- The 2011 Census recorded their population as 2,422.
- They continue to be engaged in their traditional occupation of making and selling of rudrakshamala, tulasimala, glass beads necklace and bangles.
- Some of them have traditional knowledge in herbal medicines.

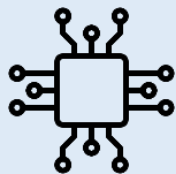
Divorce Act 1869

In News: A division Bench of the Kerala High Court said that the stipulation of the period of one year or more for filing a divorce petition by mutual consent violates fundamental rights and is unconstitutional.

- A couple moved the High Court under Section 151 of the Code of Civil Procedure.
- The couple also filed another petition to declare that the waiting period of one year fixed under Section 10A (1) of the Act is unconstitutional.

Divorce Act 1869:

- It is the only codified law governing personal laws of Christian community.
- It contains provisions for dissolution of marriages, nullity decrees, custody issues, restitution of conjugal rights etc.
- Section 10 contains grounds on which a court may dissolve a marriage.
- Section 10-A, parties may together mutually file a petition for divorce in the District Court.
- They must have lived separately for two years and must be unable to live together.



SCIENCE & TECHNOLOGY

**Dark patterns**

Context: Some Internet-based firms have been tricking users into agreeing to certain conditions or clicking a few links.

Such acceptances and clicks are flooding inboxes of the users with promotional emails they never wanted, making it hard to unsubscribe or request deletion.

These are examples of “dark patterns,” also known as “deceptive patterns.”

About Dark patterns:

- These patterns are unethical user interface designs that deliberately make users’ Internet experience harder or even exploit them.
- In turn, they benefit the company or platform employing the designs.
- By using dark patterns, digital platforms take away a user’s right to full information about the services they are using and their control over their browsing experience.
- The term is credited to UI/UX (user interface/user experience) researcher and designer Harry Brignull, who has been working to catalogue such patterns and the companies using them since around 2010.

Use of Dark patterns:

- Social media companies and Big Tech firms such as Apple, Amazon, Skype, Facebook, LinkedIn, Microsoft, and Google use dark or deceptive patterns to downgrade the user experience to their advantage.
- In social media, LinkedIn users often receive unsolicited, sponsored messages from influencers.

World AIDS Day

In News: World AIDS Day is designated on 1 December every year since 1988.

- It is an international day dedicated to raising awareness of the AIDS pandemic caused by the spread of HIV infection and mourning those who have died of the disease.
- The theme of World AIDS Day 2022 is ‘Equalized’.

About AIDS progress:

- As in 2021 – 38.4 million people were living with HIV, out of which 1.7 million were children and 54% of all were women and girls.
- In 2021, as per the Joint United Nations Programme on HIV/AIDS (UNAIDS);
 - 6, 50,000 people died of AIDS-related diseases.
 - 5 million people became newly infected– 4,000 new infections every day
- Number of people on HIV treatment increased by only 1.47 million in 2021, compared to net increases of more than 2 million people in previous years
- Global context: Out of all people living with HIV, 85 per cent knew their status, 75 per cent were accessing treatment and 68 per cent were virally suppressed in 2021.

Indian context: According to UNAIDS, an estimated 2.4 million people were living with HIV in India in 2021 (including 70,000 children).

- Out of these 1.9 million or 77 per cent knew their HIV status; 1.6 million (or 65 per cent) were on life-saving antiretroviral therapy; and 1.3 million (55 per cent) had suppressed viral load.
- 63,000 people were newly infected with HIV in 2021 in India – 173 new infections every day or seven infections every hour.
- There were 42,000 AIDS-related deaths in 2021 (5 deaths every hour).

Tidal disruption event (TDE)

Context: A mysterious and intensely bright flash of light coming from halfway across the universe earlier this year stunned astronomers worldwide. The source of the intense beam has now been identified — a supermassive black hole ripping apart a star, pointing directly at Earth.

About Tidal disruption event (TDE):

- Astronomers study Blackholes by watching for their effects on nearby stars and gas. These stars are disrupted when the black hole’s tidal gravity exceeds the star’s self-gravity, and this phenomenon is called tidal disruption events (TDE).
- The tidal disruption events are crucial and useful phenomena to detect and predict the mass of supermassive black holes in quiescent galaxies.



About Blackholes:

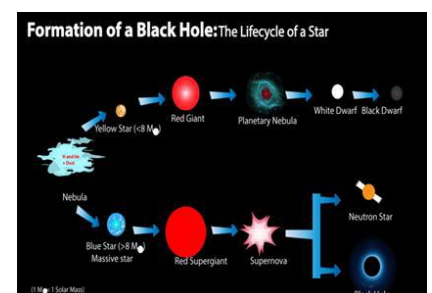
- The gravity is so strong because matter has been squeezed into a tiny space. This can happen when a star is dying.
- Visibility:
- Because no light can get out, they are invisible.
- Space telescopes with special tools can help find black holes.
- The gasses swirling around actually help in getting their images.
- Example: The supermassive black hole at the centre of the Milky Way galaxy is called Sagittarius A.
- It has a mass equal to about 4 million suns and would fit inside a very large ball that could hold a few million Earths.

STRUCTURE OF BLACK HOLES:

- **Singularity:**
The point where whole mass of a black hole is concentrated.
- **Photon Sphere:**
The outer edge where light bends but is still escapable.
- **Event Horizon:**
It is a "point of no return" around a black hole.
- **Accretion Disk:**
It is a disk of gases, dust, stars and planets that fall into the orbit of a black hole.

How Do Black Holes Form?

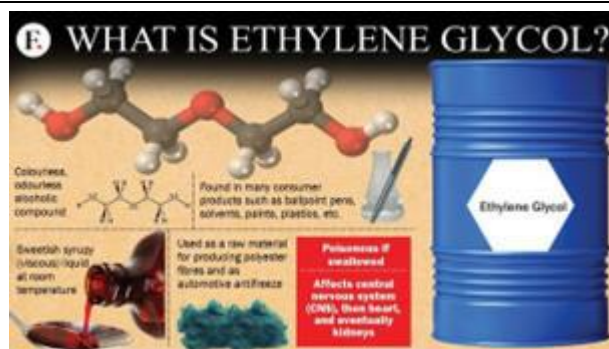
- Scientists think the smallest black holes formed when the universe began.
- Stellar black holes are made when the centre of a very big star falls in upon itself or collapses.
- When this happens, it causes a supernova. A supernova is an exploding star that blasts part of the star into space.



	<ul style="list-style-type: none"> Scientists think supermassive black holes were made at the same time as the galaxy they are in.
<p>India's first waste-to-hydrogen project</p>	<p>Context: India is planning to build its first waste-to-hydrogen project in Pune, which will turn waste into fuel.</p> <p>About Waste to Hydrogen plant:</p> <ul style="list-style-type: none"> Pune Municipal Corporation (PMC) and The Green Billions (TGBL) will use waste and convert it into useable green hydrogen. Waste will comprise biodegradable, non-biodegradable and domestic hazardous waste. Waste would be segregated in one place using optical sensor technology. Refuse-Derived Fuel (RDF) from waste would be utilised to generate hydrogen using plasma gasification technology. RDF is a fuel produced from various types of waste such as municipal solid waste (MSW), industrial waste or commercial waste. Waste-to-Energy plants are viable only when the plant can process at least 300 TPD (tons per day). <div data-bbox="1018 427 1489 651"> <p>How does green hydrogen work?</p> <p>Using the excess energy produced by renewables like wind or solar... ..green electricity could produce hydrogen through electrolysis. Hydrogen is stored safely for when needed. Green hydrogen could be used for clean power generation.</p> </div>
<p>Vikram S rocket</p>	<p>In news: On November 18, 2022, Hyderabad-based Skyroot Aerospace scripted history by becoming the first private Indian organisation to launch a rocket from Indian Space Research Organisation (ISRO)'s launch pad in Sriharikota.</p> <p>Vikram S rocket:</p> <ul style="list-style-type: none"> It is a part of Mission Prarambh, which means the beginning. It is a sub-orbital rocket, which reached outer space and then splashed into the sea. Has payload capacity of up to 300 kilograms. Vikram-S used solid fuel-ammonium perchlorate, which is not completely green fuel. With Vikram-2, it is planned to use liquefied natural gas (LNG), which is greener compared with traditional kerosene fuel. <p>About Skyroot Aerospace:</p> <ul style="list-style-type: none"> It is an Indian private aerospace manufacturer and commercial launch service provider headquartered in Hyderabad. Next launch will be Vikram-1, an orbital vehicle that puts satellites into orbit. Vikram-2 will have a higher capacity than Vikram-1. Skyroot Aerospace focuses on reusability of rockets.
<p>Ethylene Glycol</p>	<p>Context: A day after Uzbekistan alleged 18 child deaths in Samarkand from consumption of a medicinal syrup manufactured by an Indian drug maker, the Department of Chemicals and Petrochemicals with the Ministry of Chemicals and Fertilizers issued a gazette notification titled Ethylene Glycol (Quality Control) Order, 2022 on December 29.</p>

About Ethylene glycol:

- Ethylene glycol is a colourless and odourless alcoholic compound that can be fatal if consumed.
- It is mostly used as an automotive antifreeze and as a raw material for manufacturing polyester fibres.
- Diethylene glycol and ethylene glycol are adulterants that are sometimes illegally used as solvents in liquid drugs.
- Diethylene glycol and ethylene glycol may be used by pharma companies as an alternative to non-toxic solvents such as glycerine or propylene glycol to cut costs.
- It is also found in several products such as:
 - I. hydraulic brake fluids
 - II. stamp pad inks
 - III. ballpoint pens
 - IV. solvents, paints
 - V. cosmetics
 - VI. Plastics.



About Marion Biotech:

- Marion Biotech is a drug company based in Noida, Uttar Pradesh.
- It is a licensed manufacturer and holds a licence for manufacturing of Dok1 Max syrup and tablets for export purposes granted by UP Drug Control.
- Marion Biotech does not sell Dok-1 Max in India and its only export has been to Uzbekistan.

Open Standard Digital Trunking Radio System

In news: The Delhi Police will move to the 'Open Standard Digital Trunking Radio System' (OS-DTRS) and will phase out the current tetra net wireless network services.

About new system:

- It is an internal communication system of Delhi Police
- It is more efficient and aims at faster exchange of information.
- The trunking system provides multiple channels and common groups for policemen. This way they can communicate with more personnel using fewer groups.
- It will also have a voice logger system, which can be used to describe a crime scene, interrogation details and evidence. The logs are saved in the system.
- The project's master site will be at the Delhi Police HQ.
- Police are looking for private companies to run the system on 800 MHz frequency band and microwave links.

SHE STEM 2022

In News: As part of the **Sweden India Nobel Memorial Week**, SHE STEM, the annual event to celebrate women in the fields of science, technology, engineering, mathematics, and sustainability, was successfully held in New Delhi for the third year in a row on 5th December, 2022.

About the event:

	<ul style="list-style-type: none"> The annual event is organised by the Embassy of Sweden in India in partnership with the Atal Innovation Mission, NITI Aayog, Government of India and the German Centre of Innovation and Research (DWIH New Delhi). <p>Govt schemes for women:</p> <ul style="list-style-type: none"> Mission Shakti: It will ensure women and girls have equal access to resources and opportunities. Nai Roshni – scheme for Leadership Development of Minority Women is being implemented across India Gender Advancement for Transforming Institutions (GATI): a pilot project under the Department of Science and Technology to promote gender equity in science and technology. Knowledge Involvement in Research Advancement through Nurturing (KIRAN)- a plan under the Department of Science and Technology again to encourage women scientists in science and technology and also preventing women scientists from giving up research due to family reasons, are noteworthy. KIRAN – ‘Women Scientist Scheme’ – provides career opportunities to unemployed women scientists and technologists, especially those who had a break in their career. Indo-US Fellowship for Women in STEMM (WISTEMM) program– Under this bilateral agreement, Indian women scientists can now work in research labs in the US. Consolidation of University Research for Innovation and Excellence in Women Universities (CURIE) programme– It aims at improving R&D infrastructure and establishing state-of-the-art research facilities in order to create excellence in S&T in women universities. Vigyan Jyoti programme– Meritorious girl students of Class 9-12 are being encouraged to pursue higher education and career in the STEM field.
<p>Neuralink</p>	<p>In news: Neuralink, the Elon Musk company is the target of a federal investigation over its animal trial program. The company has been trying to develop a brain chip that would enable the paralyzed to walk and the blind to see.</p> <p>About Neuralink:</p> <ul style="list-style-type: none"> Founded in 2016 by Elon Musk and a group of engineers. Neuralink is building a brain chip interface that can be implanted within the skull, which it says could eventually help disabled patients to move and communicate again, and restore vision. Neuralink’s device has a chip that processes and transmits neural signals that could be transmitted to devices like a computer or a phone. It has yet to secure U.S. regulatory approval to move to human trials.
<p>ChatGPT</p>	<p>In News: Last week, OpenAI, introduced a new chatbot called ChatGPT.</p> <p>About ChatGPT:</p>

- ChatGPT is a **'conversational' AI**.
- It is based on the company's **GPT 3.5 series of language learning models (LLM)**.
- GPT stands for **Generative Pre-trained Transformer**.
- This is a kind of **computer language model** that relies on **deep learning techniques** to produce **human-like text based on inputs**.
- It is being seen as a **replacement for much of the daily mundane writing**, from an email to even college-style essays.
- The model is **trained to predict what will come next**, and that's why one can technically have a 'conversation' with ChatGPT.
- It is trained using **"Reinforcement Learning from Human Feedback (RLHF)."**
- OpenAI uses Microsoft Azure's **cloud infrastructure** to run these models.
- Users have the option of **downvoting or upvoting** a response.



Application:

- It will **answer queries just like a human** would.
- Such as tips on how to set up a birthday party, **write an essay** on why parliamentary democracy is better, and even a **fictional meeting** between two well-known personalities.
- It can answer **follow-up questions** and can also **admit its mistakes**, challenge incorrect premises, and **reject inappropriate requests**.
- It is being seen as a replacement for the **basic emails**, party planning lists, **CVs**, and even college essays and homework.
- It can also be used to **write code**, **solve math** equations, and even spot errors in code.
- It can write fiction but not at the level of a humans.

GAGAN (GPS Aided Geo Augmented Navigation)

Context: Recently consultative committee of Ministry of Civil Aviation met in New Delhi to discuss GAGAN (GPS Aided Geo Augmented Navigation).

About GAGAN:

- GAGAN is an acronym for **GPS Aided GEO Augmented Navigation**.
- It is a **Space Based Augmentation System (SBAS)** jointly developed by **ISRO and AAI** to provide the best possible navigational services over Indian airspace with the capability of expanding to neighbouring countries.
- GAGAN is a system of satellites and ground stations that provide GPS signal corrections, giving you **better position accuracy**.



Services Offered under GAGAN:

- Aviation, Forest management, Railways signalling, Scientific Research for Atmospheric Studies, Natural Resource and Land Management, Location based services, Mobile, Tourism.

How it works?

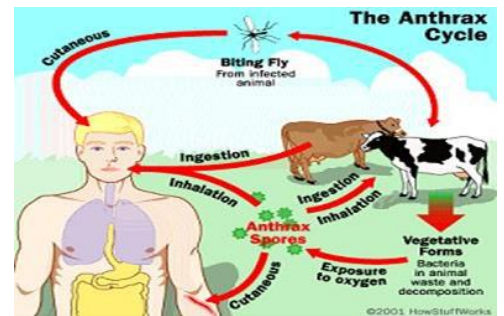
- GAGAN consists of set of ground reference stations positioned across various locations in India called Indian Reference Station (INRES), which gathers GPS satellite data.
- A master station, Indian Master Control Centre (INMCC) collects data from reference stations and create GPS correction messages.
- The corrected differential messages are uplinked via Indian Uplink Station (INLUS) and then broadcasted on a signal from three geostationary satellites (GSAT-8, GSAT-10 and GSAT-15).
- The information on this signal is compatible with basic GPS signal structure, which means any SBAS enabled GPS receiver can read this signal.
- Two GEOs simultaneously transmit the GAGAN signal in space. GAGAN GEO footprint expands from Africa to
- GAGAN provides a civil aeronautical navigation signal consistent with **International Civil Aviation Organization (ICAO) Standards and Recommended Practices (SARPs)** as established by the **Global Navigation Satellite System (GNSS) Panel**.
- The system is interoperable with other international systems.

Anthrax

Context: In 1922. On December 8th, the International Anthrax Commission has passed a resolution requiring the hairs and wools used in brush-making, upholstering and textile industries be disinfected before they are handled industrially.

About Anthrax:

- Anthrax is a **zoonotic disease** (could be transferred from animals to humans) caused by the spore-producing bacterium *Bacillus anthracis*.
- Reservoirs of anthrax are **grass-eating animals, and the spores** can survive in the environment for decades.
- It is usually a disease of wild and **domestic animals, including cattle, sheep, and goats**.
- **Human infection, while rare, does occur.**
- Human infection usually results from contact with infected animals or their products.
- **Types of Anthrax:**
 - I. cutaneous (through the skin),
 - II. gastrointestinal,
 - III. inhalational.
- There have been no confirmed cases of person-to-person transmission of cutaneous, gastrointestinal, or inhalational anthrax.
- Anthrax is most common in developing countries.



Treatment:

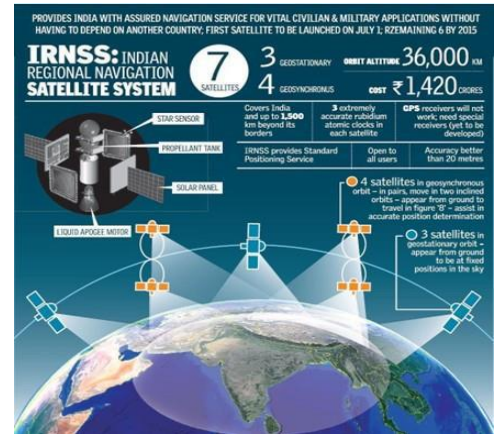
- Antibiotics, such as penicillin, are used to treat all forms of anthrax.
- An antibiotic known as ciprofloxacin (Cipro) was approved in August 2000 by the U.S. Food and Drug Administration for treating people who have been exposed to inhalational anthrax.

NavIC

In News: To promote the use of ‘NAVigation with the Indian Constellation’ (NavIC), the Indian Space Research Organisation (ISRO) will introduce the **L1 frequency** in all its future satellites, for civilian navigational use.

What is NavIC:

- It is the navigation satellite system and **homegrown alternative to GPS**.
- Developed by ISRO, it was first approved in **2006** but became operational only by **2018**.
- At present, it consists of **eight satellites**, covering the whole of India and up to **1,500 km** from its boundaries.
- The seven satellites in the NavIC constellation use **two frequencies** for providing positioning data — the **L5 and S bands**.
- The new satellites **NVS-01** onwards, meant to replace these satellites, will also have **L1 frequency**.
- NavIC is **as accurate as GPS**.



What is L1 frequency:

- The L1 is the **oldest** and most established GPS signals
- Even the **less sophisticated**, devices such as smartwatches can receive it.
- Thus, with this band, the use of NavIC in civilian-use gadgets can go up.
- GPS satellites generally transmit on two frequencies—L1 (**42 MHz**) and L2 (1227.60 MHz).

Advantages of NavIC:

- Since it is homegrown, will be **more accurate** than other systems.
- With a **fully operational constellation** and **ground stations outside of India** — ISRO plans to set up ground stations in **Japan and France to better triangulate** the entire area under NavIC coverage – the system is likely to become more accurate than GPS.
- The satellites placed directly over India also ensure **better availability of signals** in varied geographical regions compared to GPS, which India receives at an angle, making it difficult to access in dense forests or valleys.

Other navigation systems:

- Galileo – European Union
- GLONASS – Russia
- China’s – Beidou
- QZSS – Japan

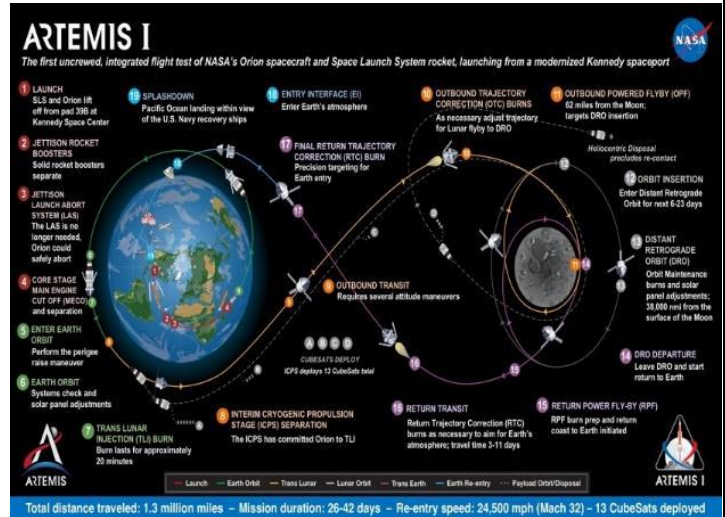
Artemis 1 mission

In News: NASA's Orion capsule splashed down back to Earth.

- The **Orion's landing in the Pacific Ocean** marked the end of the inaugural Artemis 1 lunar mission exactly 50 years after Apollo's final moon landing.
- It also performed a **new landing technique called 'skip entry'**, designed to help the spacecraft accurately splash down at the landing site.

What is the Artemis I Mission?

- Artemis I is an **uncrewed mission of NASA**.
- **Named after the sister of Apollo** in Greek mythology, it is NASA's successor to the Apollo lunar mission.
- Artemis I is the **first in a series of increasingly complex missions** to build a long-term human presence at the Moon for decades to come.



- The primary goals for **Artemis I are to demonstrate Orion's systems in a spaceflight environment and ensure a safe re-entry, descent, splashdown, and recovery prior to the first flight with crew on Artemis II**.
- It is **only a lunar Orbiter mission** even though, unlike most Orbiter missions, it has a return-to-Earth target.

What are the Upcoming Artemis Missions?

Artemis II:

- It will take off in 2024.
- Artemis II will have a **crew aboard Orion** and will be a test mission to confirm that all of the spacecraft's systems will operate as designed when it has humans on board.
- But the Artemis II launch will be similar to that of Artemis I. A **crew of four astronauts will be aboard Orion** as it and ICPS orbit the Earth twice before moving to the direction of the Moon.

Artemis III:

- It is scheduled for 2025, and is expected to ferry astronauts to the moon for the first time since the apollo missions.

Geminids meteor shower

In News: This year, the Geminids meteor shower will peak around **December 13-14**, when, with a clear sky and away from bright city lights, you can watch scores of meteors streak across the sky.

What are meteor showers:

- Meteors come from **leftover comet** particles and bits from **asteroids**
- Meteors are usually **fragments of comets**.
- As they enter the Earth's atmosphere at **high speed, they burn up**, creating a spectacular "shower".
- When these objects come **around the Sun**, they leave a dusty trail behind them.
- Every year Earth passes through these debris trails, which allows the bits to **collide with our atmosphere** where they **disintegrate** to create fiery and **colourful** streaks in the sky

**About Geminids:**

- One of the **best and most reliable annual** meteor showers
- With **new moon and clear weather**, the Geminids can produce approximately **100-150 meteors per hour** for viewing.
- The Geminids are **unique** because unlike most meteor showers, they originate not from a comet, but **from an asteroid –3200 Phaethon**.
- As the 3200 Phaethon moves close to the **Sun** while orbiting it, the **rocks on its surface heat up and break off**.
- When the **Earth passes through the trail of this debris**, the Geminids are caused.
- The name Geminids – from **constellation Gemini**, from whose location in the sky the meteor shower appears to originate.
- It serves to aid viewers in determining which shower they are viewing on a given night.
- **The constellation is not the source of Geminids.**
- **Geminids are visible throughout the night sky.**

Asteroid 3200 Phaethon:

- Discovered on October 11, **1983**.
- Named after the Greek mythology character Phaethon, **son of the Sun God Helios**.
- It takes **4 years** to complete one round of the Sun.

Fusion energy

In News: Scientists in the United States have, for the first time, achieved a **net gain in energy from a nuclear fusion reaction**, seen as a big step forward in the decades-old endeavour to master a technology that is considered the most dependable source of energy in future.

- **Fusion is a different, but more powerful**, way of harnessing the immense energy trapped in the nucleus of an atom.
- This is the process that makes the **Sun and all other stars shine and radiate energy**.
- Attempts to master the fusion process have been going on at least since the 1950s, but it is incredibly difficult and is still at an experimental stage.
- The **nuclear energy currently in use across the world comes from the fission process**, in which the nucleus of a heavier element is split into those of lighter elements in a controlled manner.

- In fusion, nuclei of two lighter elements are made to fuse together to form the nucleus of a heavier atom.
- A large amount of energy is released in both these processes, but substantially more in fusion than fission.
- For example, the fusion of two nuclei of a heavier isotope of hydrogen, called tritium, produces at least four times as much energy as the fission of a uranium atom which is the normal process of generating electricity in a nuclear reactor.
- Besides greater energy yield, fusion is also a carbon-free source of energy, and has negligible radiation risks.
- But fusion reactions happen only at very high temperatures, 10 times the temperature that exists at the core of the Sun, and creating such an extreme environment in a laboratory requires huge amounts of energy.
- So far, the energy released in such experimental fusion reactions have been lower than what is consumed to create the enabling high temperatures.
- At best, some of these reactions have produced ‘near break-even’ energies. That is why the latest experiment conducted at the Lawrence Livermore National Laboratory in California is being considered a big deal.

NUCLEAR FISSION VS NUCLEAR FUSION

Nuclear fusion and nuclear fission are two different types of energy-releasing reactions in which energy is released from high-powered atomic bonds between the particles within the nucleus. The main difference between these two processes is that fission is the splitting of an atom into two or more smaller ones while fusion is the fusing of two or more smaller atoms into a larger one.

	Nuclear Fission	Nuclear Fusion
Definition:	Fission is the splitting of a large atom into two or more smaller ones.	Fusion is the fusing of two or more lighter atoms into a larger one.
Natural occurrence of the process:	Fission reaction does not normally occur in nature.	Fusion occurs in stars, such as the sun.
Byproducts of the reaction:	Fission produces many highly radioactive particles.	Few radioactive particles are produced by fusion reaction, but if a fission "trigger" is used, radioactive particles will result from that.
Conditions:	Critical mass of the substance and high-speed neutrons are required.	High density, high temperature environment is required.
Energy Requirement:	Takes little energy to split two atoms in a fission reaction.	Extremely high energy is required to bring two or more protons close enough that nuclear forces overcome their electrostatic repulsion.
Energy Released:	The energy released by fission is a million times greater than that released in chemical reactions, but lower than the energy released by nuclear fusion.	The energy released by fusion is three to four times greater than the energy released by fission.
Nuclear weapon:	One class of nuclear weapon is a fission bomb, also known as an atomic bomb or atom bomb.	One class of nuclear weapon is the hydrogen bomb, which uses a fission reaction to "trigger" a fusion reaction.

India likely to be first to hold satellite spectrum auction

In News: India will be the first country to auction spectrum for satellite communication (SatCom).

- TRAI is working on a model for the auction of space spectrum – to encourage and promote investment in the sector
- Working on seeking permissions for satellite communication from various Ministries — Information and Broadcasting, Space and Telecom –to seamlessly enhance ease of doing business in the sector.

Note: While telecom operators have proposed allocation of spectrum through an auction for satellite communication, satellite industry players have opposed it.

What is a Communications Satellite?

- It is an artificial satellite that relays and amplifies radio telecommunication signals via a transponder; it creates a communication channel between a source transmitter and a receiver at different locations on Earth.
- Communications satellites are used for television, telephone, radio, internet, and military applications.
- The GSAT (Geostationary Satellite) satellites are India’s indigenously developed communications satellites, used for digital audio, data and video broadcasting.

Stiff-Person Syndrome

Context: French-Canadian singer Celine Dion has opened up about being diagnosed with Stiff-Person Syndrome (SPS), a rare neurological condition that makes the muscles spasm uncontrollably.

Stiff-Person Syndrome

- It is a syndrome of fluctuating but **progressive muscle stiffness and spasm** that preferentially affects axial (back and abdominal) muscles
- It is a **central nervous system disorder**, meaning encephalomyelopathy, in which myelopathic features predominate in most patients. It frequently affects women with a median onset of 35 to 40 years of age

What are its causes?

- Spasms occur at any **random time and can be triggered by loud noises, touch, and emotional distress.**
- **Autoimmune disease** is caused by **antibodies to proteins**, resulting in impaired **GABAergic (Gamma amino butyric acid) inhibition** of the motor nerves in the brain and spinal cord.
- It is associated with GAD65 (Glutamic acid decarboxylase) and amphiphysin antibodies.
- 70 per cent of patients with GAD antibodies have diabetes mellitus as comorbidity.
- It is associated with other autoimmune diseases like cerebellitis, myasthenia gravis, hypo/hyperthyroidism, rheumatoid arthritis, systemic lupus erythematosus
- The malignancies associated with stiff-person syndrome are **breast cancer, ovarian cancer, and small cell carcinoma of the lung**

Common Symptoms

- SPS is known to **affect the body posture of a person due to severe pain and stiffness in muscles in the trunk (torso), arms and legs.**
- But symptoms can also include a person having **greater sensitivity to noise, touch, and emotional distress**

Treatment

- Since it is a rare disease with heterogenous clinical manifestations, the **diagnosis may be delayed** by an average of six years following symptom onset
- Treatment involves the use of **both symptomatic agents to enhance GABAergic influences and Immuno modulating treatment** aimed at the autoimmune basis of the disease.
- In patients with paraneoplastic Stiff Person Syndrome, identification and eradication of the **underlying malignancy can alleviate symptoms.**

Thoracic aortic aneurysm

Context: Grant Wahl, a US sportswriter covering the World Cup, died in Qatar. The autopsy found that Wahl had an “ascending thoracic aortic aneurysm”, a weakening of the blood vessel that often goes undetected.

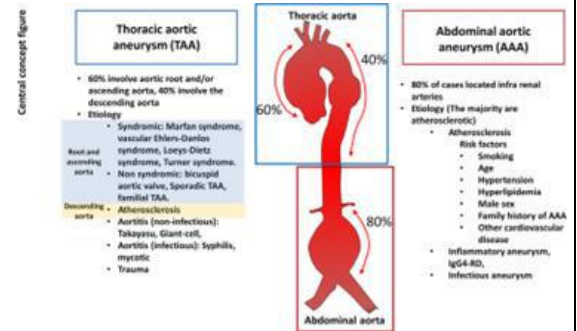
About Thoracic aortic aneurysm:

- An aneurysm is a **localized weakening of the wall of a blood vessel**, which causes the vessel to bulge in that area, as a result of which the vessel may widen to more than 50 per cent of its usual diameter.
- **Aneurysms are more commonly seen in arteries than in veins.**
- The aorta is the **main artery that carries oxygenated blood from the heart to the rest of the body and it is also the body’s largest blood vessel.**
- An **aortic aneurysm is a weakening and bulging in a portion of the aorta.**
- Thoracic refers to that section of the blood vessel that passes through the chest.

- Aneurysms occur more often in the **portion of the aorta that runs through the abdomen rather than the chest (causing what is called “abdominal aortic aneurysm”)**.
- The vessel may **ultimately burst or separate, triggering a bleeding rush that can be life-threatening, and potentially lethal.**

Causes and Symptoms

- degenerative disease that causes breakdown of the aortic wall tissue;
- genetic disorders such as Marfan syndrome;
- It is a genetic condition that affects connective tissue and can damage the blood vessels and cause aneurysms of the aorta
- family history;
- vasculitis, or inflammation of the arteries; and
- atherosclerosis, or the build-up of plaque on the walls of the artery.
- In rare cases, an infection can also trigger an aneurysm.



Treatment:

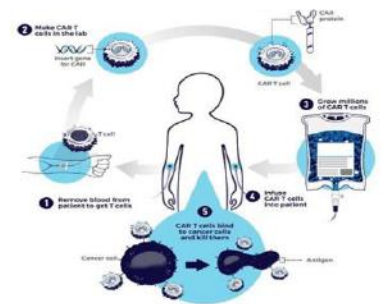
- Treatment may include monitoring the size and rate of growth of the bulge through an MRI or CT, and managing risk factors or a surgery.

CAR-T therapy

In News: Anti-cancer CAR-T therapy reengineers T cells to kill tumors — and researchers are expanding the limited types of cancer it can target.

About CAR-T therapy:

- It is made up of two parts – CAR and T.
- T refers to cytotoxic **T cells** are a particular kind of white blood cells (WBC)
- CAR-T cell therapy starts with doctors isolating a patient’s T cells from a sample of their blood.
- These T cells are genetically engineered in lab to produce a **chimeric antigen receptor, or CAR.**
- CARs are **synthetic** receptors specifically designed to **redirect T cells** from their usual targets have them recognize and hone in **on tumor cells.**
- On the **outside of a CAR is a binder** that allows the T cell to stick to tumor cells.
- Binding to a tumor cell activates the engineered **T cell to kill** and produce **inflammatory cytokines** proteins that support T cell growth and function and boost their cancer-killing abilities.
- These CAR-T cells are then stimulated to divide into large numbers over seven to 10 days, then given back to the patient via infusion.



- The **infusion process** usually takes place at a hospital where clinicians can monitor for signs of an **overactive immune response** against tumors, which can be **deadly** for the patient.

Solid tumors:

- While CAR-T cell therapy has seen **success in blood cancers**, it has faced **hurdles** when fighting what are called **solid tumor cancers** like pancreatic cancer and melanoma.
- Unlike cancers that begin in the blood, these types of cancers grow into a solid mass that produces a microenvironment of molecules, cells and structures that **prevent T cells from entering into the tumor and triggering an immune response**.
- Here, even CAR-T cells engineered to specifically target a patient’s unique tumor are unable to access it, suppressing their ability to kill tumor cells.
- So, a new synthetic receptor that complements the first CAR design is developed.
- This receptor, called **synthetic Notch receptor, or synNotch**, is based on the natural form of Notch in the body, which plays an important role in **organ development** across many species.

synNotch vs CAR:

- Like CARs, the outside of **synNotch has a binder** that allows T cells to stick to tumor cells.
- Unlike CARs, the inside of **synNotch has a protein** that is released when a T cell binds to the tumor – This protein, or transcription factor, allows researchers to **better control** the T cell by inducing it to produce a specific protein.
- While, CAR binds to both tumor and healthy cells and induce T cells to kill both; synNotch ensure that **engineered T cells are only activated when bound to a tumor cell and not healthy cells**.
- Because T cells now require both CAR and synNotch receptors to recognize tumors, this increases the precision of T cell killing.

Uniqueness of synNotch:

- Use synNotch to improve CAR-T cell activity against solid tumors by inducing them to **produce more inflammatory cytokines, such as IL-2**, that enable them to kill tumor cells.
- These cytokines are highly toxic, there is a limit to how much IL-2 a patient can safely tolerate, limiting their use as a drug.
- Using synNotch, when a CAR-T cell encounters a tumor, it **produces IL-2 within the tumor** instead of outside it, **avoiding causing harm** to healthy cells.
- **SynNotch modified CAR-T cells were able to trigger IL-2 production without causing toxicity to healthy cells in the rest of the body**.
- Because synNotch is able to bypass the barriers tumors put up, it is able to help T cells amp up and maintain the amount of IL-2 they can make, allowing the T cells to keep functioning even in a hostile microenvironment.
- It is being used to treat **lymphoma and multiple myeloma**, and has shown remarkable response rates where other treatments have failed.

Submarine Vagir

Context: Recently the fifth Scorpène-class conventional submarine, Vagir, was delivered to the Navy.

About Submarine Vagir:

- INS Vagir (S25) is the fifth submarine of the **first batch of six Kalvari-class submarines for the Indian Navy.**
- It is a **diesel-electric attack submarine** based on the Scorpène class, designed by **French naval defence and manufactured by Mazagon Dock Limited.**
- The submarine inherits its name from **INS Vagir (S41) which served in the Navy from 1973–2001**, and was named after a species of sandfish.
- **Kalvari class:**
 - The Kalvari class is a class of **diesel-electric attack submarines** based on the **Scorpène-class submarine** being built for the Indian Navy.
 - The class and submarines take their names from the first submarines inducted in the Indian Navy.
- The **Sixth and last of the Scorpène-class submarines, Vagsheer**, was launched into water in 2022 and is expected to be delivered to the Navy by 2023-end.
- The first submarine, **INS Kalvari**, was commissioned in 2017, the **second INS Khanderi** in 2019, the **third INS Karanj** in 2021 and the **fourth INS Vela in 2021.**

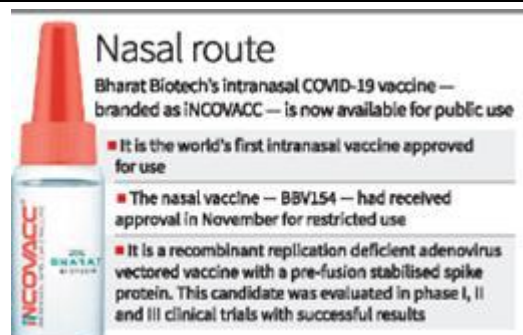


iNCOVACC

Context: Ramping up its anti-Covid measures amid a surge in cases in other countries, mainly China, the Government has added Bharat Biotech’s intranasal vaccine Incovacc to its vaccination programme as a mix-and-match, or heterologous, booster dose.

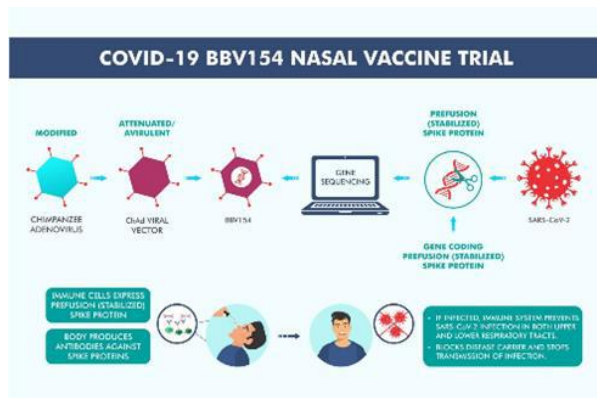
About Incovacc:

- Incovacc is the world’s first intranasal vaccine to be approved as a booster dose.
- iNCOVACC, co-developed by **Bharat Biotech and the U.S.-based Washington University**, was approved in November for ‘**restricted emergency use**’ for those aged 18 or older.
- The nasal vaccine is approved both as a **primary dose and a heterologous booster.**
- **Unlike Covaxin**, which is an **inactivated coronavirus** injected along with an adjuvant, iNCOVACC is an **adenovirus-vectored vaccine** with a “**prefusion stabilised spike protein**”, which is more like the technology employed in the Covishield vaccines.



Advantages:

- It promises to become an important tool in mass vaccinations during pandemics and endemics.
- It is easy to administer as it is non-invasive and does not require trained health care workers.
- It also eliminates needle-associated risks such as injuries and infections, has higher compliance and is scalable as far as manufacturing is concerned.
- The sprays don't need to be refrigerated.



GaN Nanostructures

In News: Researchers in Bengaluru's Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), an autonomous institute under DST, have shown for the first time infrared light emission and absorption with GaN nanostructures.

GaN nanostructures:

- It is a widely used material for **blue light emission** like **Blue LEDs**
- It is one of the most advanced **semiconductors**.
- It is already used in **visible and ultraviolet light** with **LEDs** and **laser diodes**
- Now, for the first time a **new method** to confine and absorb **infrared (IR) light** with **GaN nanostructures** has been developed.

Technology used:

- A scientific phenomenon called **surface polariton excitations** in GaN nanostructures leads to **light-matter interactions** at IR spectral range.
- **Surface polaritons** are special modes of **electromagnetic waves** traveling at the interface of a conductor and an insulator such as air.
- By altering the morphology and shape of the nanostructures, they are also able to excite plasmon polaritons in GaN, which results in extending the light-matter coupling to further reaches of the electromagnetic spectrum.
- Surface polaritons are **quasi-particles which have both light and matter characteristics**.
- To grow these GaN nanostructures, the researchers utilized a specialized material deposition instrument called **molecular beam epitaxy**.
- This instrument **uses** ultra-high **vacuum**, like the conditions of **outer space**.
- This instrument grows high-quality material nanostructures with dimensions about **100000 times smaller than the width of a human hair**.

Applications:

- It can help develop highly efficient infrared absorbers, emitters, and modulators that are useful in **defense technologies, energy technologies, imaging, sensing**, and so on.
- **Polaritonic technologies** have attracted a wide range of applications, such as secure high-speed light-based communication (**LiFi**), next-generation light

sources, solar energy converters, quantum computers, and waste-heat converters.

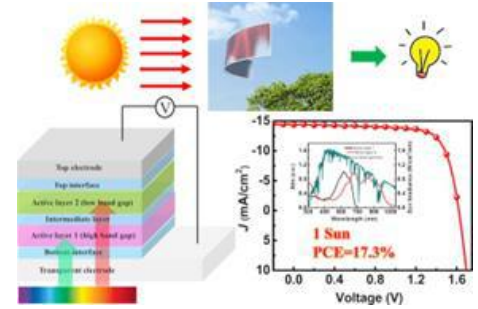
- In the last 25 years, **blue LED** with GaN has changed our world significantly.
- The infrared surface polariton excitations can be translated to many other semiconductors as well.

Organic solar cells

Context: Recently researchers of IIT Kanpur have developed organic solar cell which can convert a steel roof into an energy-producing device. It was supported by fundings from **Department of science and technology (DST)** under **DST-RCUK APEX project**.

About Organic solar cells:

- Organic solar cell consisting of combination of **organic polymer PTB7** a donor and **PCBM (an organic semiconductor)** as an acceptor.
- It is a **third-generation solar technology**.
- Benefits:



- **Higher optical transmission** as compared to only metallic electrodes
- Device with multilayer electrodes showed **improved photovoltaic performance by 1.5 times** compared to **single-layer top metal electrodes of gold**.
- Organic solar cells can be integrated onto **flexible and conformal surfaces like steel**.
- However, this requires **new, transparent conducting electrodes** that are more durable and have **better optoelectronic efficiency** than the **indium tin oxide** currently used.

Green Methanol

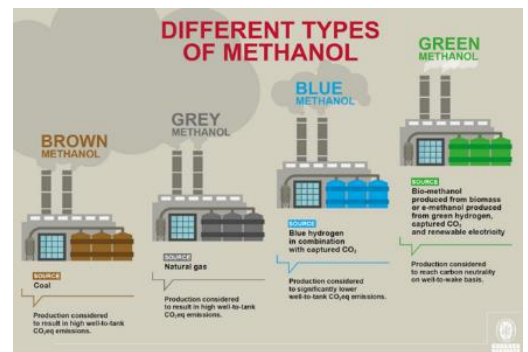
Context: Recently, the NTPC (National Thermal Power Corporation) has signed a non-binding MOU with Tecnimont (Italy) to explore production of green methanol.

About Green Methanol:

- Green methanol is a low-carbon fuel that can be made from either biomass gasification or renewable electricity and captured carbon dioxide (CO₂).

Applications:

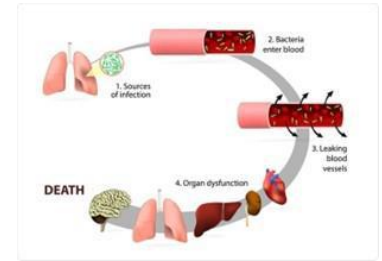
- The green methanol has a wide range of applications:
 - Serving as a base material for the chemical industry
 - Storing renewable electricity
 - Transportation fuel.
- **Maritime fuel:** It is also considered as a substitute fuel for maritime fuel applications.
- **Automotive industry:** Methanol can be blended with gasoline in low-quantities and used in existing road vehicles, or it can be used in high-proportion blends such as



	<p>M85 in flex-fuel vehicles or M100 in dedicated methanol-fuelled vehicles as a substitute for gasoline or diesel.</p> <p>About National Thermal Power Corporation:</p> <ul style="list-style-type: none"> • NTPC is India’s largest power utility with an installed capacity of 68,961.68 MW plans to become a 130 GW company by 2032. • NTPC comes under the ministry of power. • Established in 1975, NTPC aims to be the world’s largest and best power major. • NTPC has comprehensive Rehabilitation & Resettlement and Corporate Social Responsibility (CSR) policies well integrated with its core business of setting up power projects and generating electricity. • The company is committed to generating reliable power at competitive prices in a sustainable manner by optimising the use of multiple energy sources with innovative eco-friendly technologies thereby NTPC is contributing to the economic development of the nation and upliftment of the society.
<p>Naegleria fowleri or Brain-eating amoeba</p>	<p>Context: South Korea reported its first case of infection from Naegleria fowleri or “brain-eating amoeba.</p> <p>About Naegleria fowleri:</p> <ul style="list-style-type: none"> • Naegleria is a free-living amoeba (a single-celled living organism). • It is so small that it can only be seen with a microscope. • It is commonly found in warm fresh water (such as lakes, rivers, and hot springs) and soil. • Only one species of Naegleria infects people: Naegleria fowleri. • The organism best grows in high temperatures up to 46°C and sometimes can survive at even higher temperatures. • In very rare instances, people have gotten Naegleria fowleri infections from recreational water that didn’t have enough chlorine in it, such as pools, splash pads, or surf parks. • There is no evidence that Naegleria fowleri can spread through water vapor or aerosol droplets (such as shower mist or vapor from a humidifier). • People cannot be infected with Naegleria fowleri by drinking contaminated water. • Treatment: At present, doctors treat it with a combination of drugs, including amphotericin B, azithromycin, fluconazole, rifampin, miltefosine, and dexamethasone.
<p>Sepsis</p>	<p>In News: A new research clarifies how sepsis can lead to cell death.</p> <p>Sepsis:</p>



- Sepsis is a life-threatening condition arising from the body's **overreactive response against an infection**, leading it to injure its own tissues and organs.
- The first known reference to "sepsis" dates back more than 2,700 years, when the Greek poet Homer used it as a derivative of the word "sepo," meaning "I rot."
- Affects 750,000 people in the US and nearly 50 million people globally each year.
- Sepsis accounted for 11 million deaths worldwide in 2017, and is the **most expensive** medical condition in the US, costing over tens of billions of dollars annually.



How autoimmunity works

- The body's response to infection starts when **immune cells recognise** components of the invading **pathogen**.
- These cells then **release** molecules like **cytokines** that help eliminate the infection.
- Cytokines are a broad group of small **proteins that recruit** other immune cells to the site of infection or injury.
- **Excessive** and uncontrolled cytokine production can lead to a dangerous **cytokine storm** that can cause **sepsis**.
- **Cytokine storms** occur in graft versus host disease, transplant complications, **viral infections**, including **COVID-19**.
- This uncontrolled immune response can lead to **multi-organ failure and death**.

Tumour necrosis factor(TNF):

- It is the **most potent cytokines**
- It **induces tumour cells to die** when the immune system is stimulated by a **bacterial extract called Coley's toxin** (a lipopolysaccharide, or LPS – component of outer membrane of certain types of **bacteria**).
- **LPS is the strongest known trigger of TNF**, which, once on alert, aids in the **recruitment** of immune cells to the infection site to eliminate invading bacteria.
- In **normal conditions**, TNF promotes beneficial processes such as cell survival and tissue regeneration.
- Uncontrolled TNF production can lead to the development of **rheumatoid arthritis** and similar inflammatory conditions.
- **Uncontrolled TNF** during infections can **lead to sepsis**.
- Hence, TNF production **must be tightly regulated to avoid sustained inflammation** and continuous proliferation of immune cells and to prevent excessive tissue and organ damage from inflammation and an overactive immune response.

Treatment:

- **Blocking TNF** activity can effectively treat numerous autoimmune diseases, including rheumatoid arthritis, psoriatic arthritis and inflammatory bowel disease.
- **Neutralizing TNF** can prevent the death of the animal from bacterial LPS

	<ul style="list-style-type: none"> • Blood cells made in the bone marrow, or myeloid cells, are known to be the major producers of TNF. • TRIF and CD14 as potential treatment targets for sepsis, with the ability to both reduce cell death and inflammation. • TNF blockers have been unsuccessful in preventing the cytokine storm that can arise from COVID-19 infections and sepsis.
<p>Rare disease 'GNB1 Encephalopathy'</p>	<p>In News: Researchers at the Indian Institute of Technology (IIT), Madras, Tel Aviv University and Columbia University are studying a rare genetic brain disease called “GNB1 Encephalopathy” and trying to develop a drug to treat it effectively.</p> <p>GNB1 Encephalopathy</p> <ul style="list-style-type: none"> • It is a kind of brain disease or neurological disorder which affects individuals in the foetus stage. • With less than 100 documented cases worldwide • Children born with GNB1 mutation experience delayed physical and mental development, intellectual disabilities, epilepsy (abnormal brain activity), movement problems, muscle hypotonia or hypertonia. • A potassium channel called G-protein gated Inwardly Rectifying K+ (GIRK channel (present in brain, heart and endocrine glands)) function is affected significantly. • As I80T mutation is the most prevalent variant in GNB1 encephalopathy patients. <p>How it occurs:</p> <ul style="list-style-type: none"> • A single nucleotide mutation in the GNB1 gene that makes one of the G-proteins, the “Gβ1 protein,” causes Encephalopathy. • Every cell in the human body has a wide variety of signalling molecules and pathways that help in communicating with other cells and within itself. • The major signalling mechanism used by cells is ‘G-Protein Coupled Receptor’ (GPCR signalling). • GPCR is a receptor that receives a signal (e.g. a hormone, light, neurotransmitter) from the outside of the cell and transduces it to the inside of the cell. • GPCR is present in the cell membrane and has a G-protein ($\alpha\beta\gamma$) attached to it from inside the cell. • G-proteins are the immediate downstream molecules that relay the signal received by the GPCR. • These G-proteins are present in every cell, and any malfunction will cause disease. <p>Treatment:</p> <ul style="list-style-type: none"> • As the developmental issues start at the fetal stage, gene therapy is the most plausible option to alleviate the effects of the mutation. • Whole genome sequencing, the elucidation of the full genetic analysis of the baby, can be very helpful in early diagnosis of the disease. • Epilepsy can be treated using specific drugs to increase the patient’s quality of life. • To treat epilepsy, specific targets have to be identified. • Most epilepsies are caused due to altered ion channel function. • Ion channels are proteins that underlie the electrical activity of neurons and heart cells.

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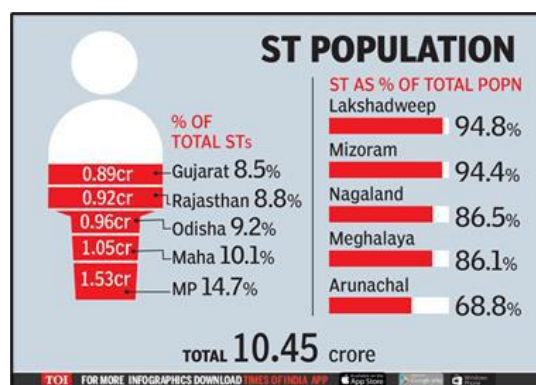
Integrating tribal knowledge systems

Context: Recently, President Droupadi Murmu while addressing the delegates of a National Workshop on 'Janjatiya Anusandhan – Asmita, Astitva evam Vikas' said that the Indian Knowledge System (IKS) that the National Education Policy is currently emphasizing needs to incorporate the knowledge of indigenous tribes.

- According to the **2011 Census**, the **Scheduled Tribes account for 104 million representing 8.6% of the country's population**. The essential characteristics of these communities are:
- **Primitive Traits; Geographical isolation; Distinct culture; Shy of contact with community at large; Economically backwards.**

About Integrating tribal knowledge systems:

- Tribal knowledge systems **represent inter-generational wisdom** in band societies passed on to the present times through centuries of experience and learnings.
- Tribal societies have **contemporary knowledge of nature due** to continued closeness to forests, flora and fauna.
- Tribal methods are based on conservation of knowledge.
 - For example, the **awareness among tribals of Andaman & Nicobar about a wall of sea helped them against Tsunami in 2004.**



Significance of Tribal Knowledge Systems:

- Tribal societies have contemporary knowledge of nature due to continued closeness to forests, flora and fauna. Mainstream societies have moved on to agricultural basis of society, and their cultural knowledge represents impressions of their tribal past, which no longer exists.
- While mainstream knowledge systems are based on rigorous refining and questioning of ideas through discussions and scientific verification, tribal methods are based on conservation of knowledge.
- Tribal knowledge systems are stored in songs and stories, while mainstream knowledge is preserved in books and recordings.
- Tribal knowledge systems promote integrated learning for the community. In mainstream society, knowledge and traditions have bifurcated, with traditions becoming a subject of study instead of mode of studying.
- Tribal knowledge systems are non-exclusionary and marked by equity.
 - Mainstreams knowledge systems are mired in barriers like cost of education, patent protections, social exclusion etc.

Government of India Initiatives for Tribal welfare:

Eklavya Model Residential Schools

- The objective of EMRS is to provide quality middle and high-level education to Scheduled Tribe (ST) students in remote areas, not only to enable them to avail of reservation in high and professional

education courses and as jobs in government and public and private sectors but also to have access to the best opportunities in education at par with the non-ST population.

Tribes India E-Marketplace:

- Tribes India E-Marketplace is India's largest handicraft and organic products marketplace.
 - The initiative aims to onboard 5 lakh tribal producers for sourcing various handicraft, handloom, and natural food products across the country and brings to you the best of tribal produce.
- The suppliers comprise individual tribal artisans, tribal SHGs, and Organisations/ Agencies/ NGOs working with tribals.

Vanabandhu Kalyan Yojana

- The Government of India, Ministry of Tribal Affairs has launched the Vanabandhu Kalyan Yojana (VKY) for the welfare of Tribals.
 - KY aims at creating enabling environment for need-based and outcome-oriented holistic development of the tribal people.

Minor Forest Produce

- Minor Forest Produce (MFP) is more often than not determined by the traders instead of the self-sustained process of demand and supply.
 - Implementing a scheme to ensure that such forest dwellers are not deprived of their due.
- Under the scheme maximum selling price for MFP is being implemented in schedule V States initially.
- A web-based portal has also been developed which indicates the current price of MFPs on a real-time basis across different mandis of States.

Van Dhan Scheme:

- The Van Dhan Scheme is an initiative of the Ministry of Tribal Affairs and TRIFED. It was launched on 14th April 2018 and seeks to improve tribal incomes through the value addition of tribal products.
- The scheme will be implemented through the Ministry of Tribal Affairs and TRIFED as Nodal Agency at the National Level.
 - At the State level, the State Nodal Agency for MFPs and the District collectors are envisaged to play a pivot role in scheme implementation at the grassroots level.

Tribal museums:

- There are records of over 200 tribal freedom fighters across India who participated in about 85 instances of revolts and uprisings against colonial rule.
- To recognise this, **10 tribal freedom fighter museums** are being set up in the States of Andhra Pradesh (Lambasingi), Chhattisgarh (Raipur), Goa (Ponda), Gujarat (Rajpipla), Jharkhand (Ranchi), Kerala (Kozhikode), Madhya Pradesh (Chhindwara), Manipur (Taminglong), Mizoram (Kelsey) and Telangana (Hyderabad) will showcase the contribution of tribal freedom fighters.

About National Commission for Scheduled Tribes

- The National Commission for Scheduled Tribes was established by amending Article 338 and inserting a new Article 338A in the Indian Constitution through 89th Amendment Act, 2003.
- The National Commission for Scheduled Tribes is a constitutional body.
- Its role is to safeguard the interests of the scheduled tribes or under any other order to the Government and to evaluate the working of such safeguards.
- The Union and every State Government shall consult the Commission on all major policy matters affecting Scheduled Tribes.

- The Commission and its officers participate in formulation of policies and in the developmental programmes for Scheduled Tribes including Tribal Sub-Plan.

Women in Judiciary

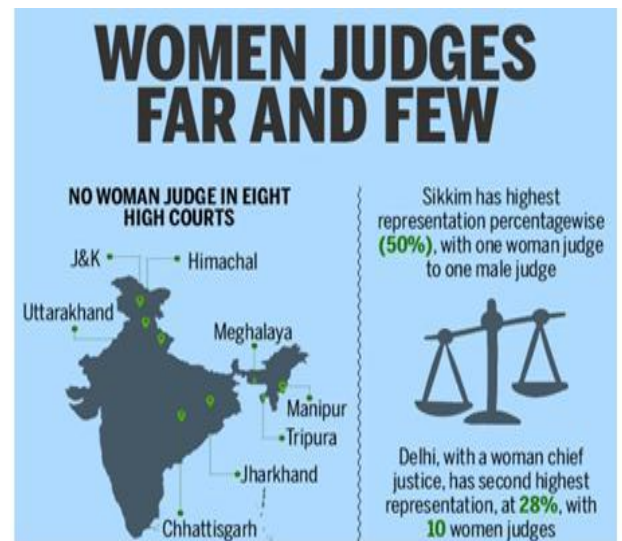
Context: Recently for the third time in the history of the Supreme Court that a bench comprising only women judges was hearing cases. The first time the Supreme Court had an all-woman bench was in 2013 & the second occasion came in 2018.

Women Judges in Supreme Court:

- The apex court had its first woman judge in 1989, when **Justice M Fatima Beevi** was appointed after her retirement as a judge of Kerala High Court.
- Since its inception, India has seen **only 11 women judges in the Supreme Court and no women CJI for that matter.**
- The apex court currently has **only three women judges:** Justices Kohli, B V Nagarathna, and Bela.M.Trivedi.
- Justice Nagarathna is set to go on to be the country's first woman Chief Justice in 2027.

Present Status of Women in Indian Judiciary:

- **High Courts:**
 - In High Courts, women judges constitute 11.5%.
- **Subordinate Courts:**
 - About 30 percent are women judicial officers in the subordinate courts.
- **Advocates:**
 - Of the 1.7 million advocates, only 15% are women.
- **Bar Council:**
 - Only 2% of the elected representatives in the State Bar Councils are women.
 - There is no woman member in the Bar Council of India.



Reasons for Low Women Representatives in Judiciary:

- **Patriarchy in Society:** The primary reason for underrepresentation of women in judiciary is deeply ingrained patriarchy in society. Women often have to face hostile atmospheres within courtrooms. Harassment, lack of respect from members of the bar and bench, the silencing of their opinions, are some of the other traumatic experiences often recounted by many women lawyers.
- **Opaque Collegium System Functioning:** More women tend to enter the lower judiciary at the entry level because of the method of recruitment through an entrance examination. However, the higher judiciary has a collegium system, which has tended to be opaquer and, therefore, more likely to reflect bias.
- **No Women Reservation:** Many states have a reservation policy for women in the lower judiciary, which is missing in the High Courts and Supreme Court.
- States such as Assam, Andhra Pradesh, Telangana, Odisha and Rajasthan have benefited from such reservation as they now have 40-50% women judicial officers.

- **Familial Responsibilities:** Factors of age and family responsibilities also affect the elevation of women judges from the subordinate judicial services to the higher courts.
- **Lack of Judicial Infrastructure:** The lack of Judicial Infrastructure is another barrier to women in the profession. Small courtrooms which are crowded and cramped, absence of restrooms, and childcare facilities are all barriers.

Significance of Women’s participation in Judiciary:

- **Need for diversification:** Diversification brings positive institutional changes, and the judiciary needs to be more diverse.
- **Balanced justice delivery system:** The presence of women as judges and lawyers will substantially improve the justice delivery system.
- **Balanced and empathetic approach:** Improving the representation of women in the judiciary could go a long way towards a more balanced and empathetic approach in cases related to sexual violence.
 - The issue of gender sensitization has been raised many times, especially in cases where male judges failed to show empathy for the female victims.
- **Legitimacy:** The judiciary will not be trusted if it is viewed as a bastion of elitism, exclusivity and privilege.

Suggestive measures to be adopted to include more women judges in the Judiciary:

Suggestions by the previous Chief Justice of India N.V. Ramana:

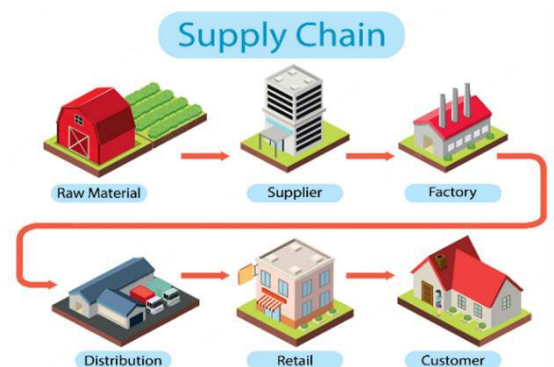
- **50% representation:** Previous CJI also voiced his support for 50% representation for women in judiciary.
- **Legal Education:** He has highlighted the need to increase gender diversity in legal education.
 - There should be a fixed number of seats, reserved for women candidates, in all colleges and universities providing law courses.
- **Availing basic facilities:** He said the need for basic facilities, especially for women, need to be addressed immediately.
- **Need of separate entity:** He repeatedly pressed for the need to form a separate entity — National Judicial Infrastructure Corporation — to introduce inclusive designs for court complexes and create a more welcoming environment in them.

Enabling resilient supply chains

Context: The global supply chain dynamics was severely disrupted in the last two years of the pandemic coupled with the geopolitical shocks of the Ukrainian crisis. Thus, there is an urgent need to make global supply chains more resilient to endure another ‘black swan’ event like the Covid-19 pandemic.

About Supply Chains:

- A supply chain transforms raw materials and components into a finished product that’s delivered to a customer.
- It is made up of a complex network of organizations and activities, such as **raw materials suppliers, manufacturers, distributors, retailers and the customer.**
- Examples of **supply chain activities** can include **designing, farming, manufacturing, packaging, or transporting.**



Significance of Global Supply Chain management:

- **Higher Efficiency**

- **Reduced Overall Operational Cost and risk assessment**
- **Enhance Customer Experience**
- **Manage Supply and Demand**
- **Business Agility:** Supply chain management enables businesses to be more resilient and adaptive to opportunities. Supply chain agility tends to meet **actual and unexpected demand changes** as it implements new-age technologies like **Internet of Things, Big Data, and Artificial Intelligence in Logistics and so on.**

Government of India's Initiatives to boost strong GSC:

- **The National Logistics Policy (NLP):** Known as the Comprehensive Logistics Action Plan, the National Logistics Policy is an agenda to **transform India's logistics landscape by 2024.**
 - The policy comes at a time when the country is already witnessing major changes in infrastructure planning such as-
- **PM Gatishakti National Master Plan (NMP):** By adopting a '**whole of the government approach**' more than 1,400 connectivity projects have been planned which include 2,00,000 km of National Highways, more than 65 ports, three National Waterways, over 100 airports, and helipads and increasing the capacity of the rail network in the next few years.
 - The National Logistics Policy adopts a similar **approach and the proposals include efficiency drivers such as digitisation for enhancing human resource development.**
 - The policy dedicates specific chapters to creating an efficient EXIM Logistics landscape.
- The NMP-NLP complementarity will provide a greater boost to the ongoing initiatives of the government.
 - For instance, the government's **One District, One Product (ODOP) and District as Export Hubs (DEH) schemes** have been a significant effort towards building regional value chains across districts and their primary focus has been on identifying, branding, and promoting products from each district for exporters through district-level management and production.
- While the PM GatiShakti NMP can provide the infrastructure for these districts, the NLP can help the exporters from the district in developing their regional supply chains.
- The introduction of new age technologies such as **AI, Blockchain, Machine Learning, along with creation of a pool of skilled and knowledgeable workforce** through the policy will enhance resilience.
- PM GatiShakti and the National Logistics Policy together have the potential to not only bring resilience to the global supply chain dynamics that India can be connected to but also make the supply chain more standardised, predictable, and cost-efficient.
- The combination will enable **synergies between human resource and technology and increase the efficiency of logistics.**
- Such a complementarity between the two will also **de-risk global investments in setting up manufacturing bases within the country thus helping India leverage the China+ 1 strategy.**

Way Forward:

The GSC will aid **India's manufacturing competitiveness** and increase its global trade share. In this pursuit, there is a need to build **infrastructure that boosts India's export competitiveness.** While India appears to be an appealing option for potential investors as both a market and a manufacturing base, it needs to accelerate progress in terms of ease of doing business and skill development.

As India takes over the presidency of G20, opportunities open up for India to lead by example in bringing about the desired resilience through transformative policy interventions and state-of-the-art technology.

Remittance to India

Context: In its Migration and Development Brief, the World Bank has said India's remittance will grow 12 per cent from 7.5 per cent last year, resulting in \$100 billion flow as compared to \$89.4 billion in 2021.

Key findings of the report: South Asia

- Led by strong performances in India and Nepal, the WB has predicted that this year will grow 3.5 percent to reach \$163 billion in 2022.
- While India has gained 12 percent and Nepal 4 percent, other countries have reported an aggregate decline of 10 percent.
- The report also says that despite global challenges in 2022, remittances to low- and middle-income countries will grow by 5% to \$626 billion.
- This is, however, a slowdown from the 6.7 percent gain of 2021, reflecting the impact of an amalgam of external global shocks (inflation, slowing demand) in destination and source countries alike, as well as domestic factors.

Reason for this rise:

- The large share of Indian migrants earning relatively high salaries in the United States, United Kingdom and East Asia.
- There's been a gradual shift in **destinations for Indian migrants**.
 - Migrants moved from largely low-skipped, informal employment in **the Gulf Cooperation Council (GCC) countries** to a dominant share of high-skilled jobs in high-income countries such as the **United States, the United Kingdom, and East Asia (Singapore, Japan, Australia, New Zealand)**.
- A structural shift in qualifications helped them move into the highest-income-earner-category, especially in services.
- Higher education mapped onto high income levels with direct implications for remittance flows.
- During the Covid-19 pandemic, **Indian migrants in high-income countries benefited from work-from-home and large fiscal stimulus packages**.
- Despite Indian migrants in the Gulf Cooperation Council returning to India during the pandemic, **price support policies kept inflation at bay and demand for labour increased with higher oil prices**, which in turn increased remittances for Indian labourers.
- **Depreciation of the Indian rupee to the US dollar** — it fell 10 percent between January and September 2022 — proved to be advantageous for Indian migrants and increased remittance flows.
- In last two years, **vaccinations and the resumption of travel** helped migrants resume work, increasing remittance to the country.

Significance of rise in remittances:

- Money sent home by migrants is one of the largest financial inflows to developing countries.
- Remittances are a **more stable and reliable form of foreign earnings** in many developing countries in comparison to FDI or international aid.
- It helps in **alleviating the Balance-Of-Payments (BOP)** and the debt crisis of such countries.
- Remittances are a **stabilising factor for national currencies** of developing countries.
- Remittances are **helping to meet families' increased need for livelihood support**.
- As COVID-19 still devastates families around the world, remittances continue to provide a critical lifeline for the poor and vulnerable.

Context: According to 'India Inequality Report 2022: Digital Divide' released by the NGO Oxfam India recently, Indian women are 15 per cent less likely to own a mobile phone and 33 per cent less likely to use mobile internet services than men.

Highlights of the report:

- The report analyses the primary data from **Centre for Monitoring Indian Economy's (CMIE) household survey** held from Jan 2018 to Dec 2021.
- **Indian Women internet users:** Indian women are 15 percent less likely to own a mobile phone and 33 percent less likely to use mobile internet services than men.
 - Women constitute only one-third of internet users in India.
- **India's position globally:** In Asia-Pacific, India fares the worst with the widest gender gap of 40.4 percent, says the study.
- **Rural-urban digital divide:** Despite registering a significant (digital) growth rate of 13 percent in a year, only 31 percent of the rural population uses the Internet compared to 67 percent of their urban counterparts, says the report.
- **Caste-wise divide:** In rural India, the tendency to use formal financial services is lowest for ST households, followed by SC households and OBC households.
 - The likelihood of access to a computer is more for the General and OBC groups than for the SC and ST populations.
 - The difference between the general category and ST is as high as seven to eight percent between 2018 and 2021.
- **Religion-wise:** Among all religions, Sikhs have the highest likelihood of having a computer followed by Christians, Hindus and lastly Muslims.
- **Access to computer and internet for education:** As per **the National Service Scheme [NSS (2017-18)]**, only about 9 percent of the students who were enrolled in any course had access to a computer with internet and 25 percent of enrolled students had access to the internet through any kind of devices.
 - The chances of having a computer are higher with higher levels of education as well as income.
 - Among states, **Maharashtra has the highest internet penetration**, followed by Goa and Kerala, while **Bihar has the lowest**, followed by Chhattisgarh and Jharkhand, the report said
- **Effect of pandemic and digital payments:** The digital push driven by the pandemic resulted in India experiencing the largest number of real-time digital transactions in 2021 at 48.6 billion.
 - However, the likelihood of a digital payment by the richest 60 percent is four times more than the poorest 40 percent in India.

About Digital divide:

- Digital divide is a term that refers to the gap between demographics and regions that have access to modern information and communications technology, and those that don't or have restricted access. This technology can include the telephone, television, personal computers and the Internet.
- Digital inequality is evident between communities living in urban areas and those living in rural settlements; between socioeconomic groups; between less economically developed countries and more economically developed countries; between the educated and uneducated population.

Consequences of Digital Divide:

- **Political:** In the age of social media, political empowerment and mobilization are difficult without digital connectivity.
- **Health and Governance:** Transparency and accountability are dependent on digital connectivity. The digital divide affects e-governance initiatives negatively.

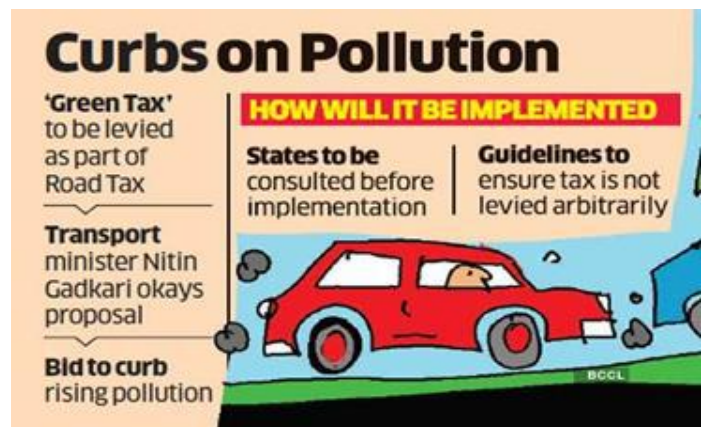
- **Social:** Internet penetration is associated with greater social progress of a nation. Thus, digital divide in a way hinders the social progress of a country.
 - Rural India is suffering from information poverty due to the digital divide. It only strengthens the vicious cycle of poverty, deprivation, and backwardness.
- **Economic:** The digital divide causes economic inequality between those who can afford the technology and those who don't.
- **Educational:** The digital divide is also impacting the capacity of children to learn and develop. Without Internet access, students cannot build the required tech skills.

Green Tax in the aid of sustainable development

Context: Efforts are being made by Governments, civil societies, corporates, businesses and even the common people towards net-zero emissions to nullify climate change and global warming. India is in the driver's seat in these efforts and can explore a new dimension of taxing emissions which will augment the government revenues.

About Green Tax:

- A Green Tax is a **type of tax levied by the government for the purpose of environmental conservation.**
- It is believed **charging taxes on emissions that cause pollution** will lower environmental impairment in a cost-effective manner by encouraging behavioural changes in households and firms that need to decrease their pollution.
- The revenue collected through such tax can **be used to create green energy infrastructure, combat environmental pollution, afforestation and other such purposes which help in conserving the environment.**
- In India, many state governments such as Goa and Gujarat have provision for green tax or cess.
- The Ministry of Road Transport and Highways (MoRTH) had introduced a similar tax called Green Tax / Eco Tax on older vehicles.



Potential of revenue generation through green taxing in India:

- India's top 4,000 odd companies had a combined turnover of roughly ₹100 trillion in 2021-22.
- Intuitively, if a small green tax is imposed on the sales of these companies linked to pollution it may fetch large revenues.
 - For example an **average green tax at 0.5% of the turnover will generate ₹50,000 crores annually for the government.**
 - This can be used to finance budget spending and it will complement the government's efforts of issuing green bonds for projects that are environmentally compliant.
 - Services with no factories add to ecological atrophy with their buildings (fancy glass-front edifices of modern commercial complexes and cooling emissions) and servers that add to global warming
- The green tax need **not be uniformly applied, and its rate could vary from 0.1% to 2%, depending on the industry concerned.**

- As the sales of these companies/ industries grow, they would automatically yield higher revenues to the government.

Challenges of imposing Green Tax on all business:

- Assessing individual firm's emissions with accuracy and proportional tax rate is a difficult process and presently there is no such robust technology in existence.
- Companies may pass the tax cost onto the customers which may lead to inflation and a rise in prices, such steps are not desirable for vulnerable sections.
- Lack of enforcement at the grassroots plagued by corruption may lead such initiatives to become just one more tax among the many.
- It may hamper the small and local industries, MSMEs as their costs will increase which will reduce their competitiveness.
- Some companies have been observed to indulge in 'greenwashing' just to meet CSR obligations and may find such loopholes for the Green taxing as well.

Way Forward:

A Green Tax could be a right step on the lines of single taxing for emissions but it poses many challenges such as passing of costs onto the customers but it would not be very significant and can be absorbed. Moreover, consumers of products and services that are environmentally unfriendly would also be made accountable to the world at large. All in all the cost has to be borne by somebody but the government is sure to be a big beneficiary.

Food Security in India

Context: Expanding Public Distributing System coverage to account for the increase in population since 2011 is a no-brainer; the Government's resistance to implementing a Supreme Court of India direction is baffling.

- India has ranked **101 among the 116 countries on the Global Hunger Index, 2021**. According to the **Food and Agriculture Organisation, the Food Price Index has increased by 30% in the year 2021-22**.

About Food Security:

- Food security is the **measure of the availability of food and individuals' ability to access it; meaning that all people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food** that meets their food preferences and dietary needs for an active and healthy life.

Impact of the pandemic on Food Security: Recently, the **Food and Agriculture Organization (FAO)** has released the **State of Food Security and Nutrition in the World 2021 report**. The key findings are,

- **Loss of income and rise in food prices:** The primary reason for a dip in affordability is the loss of income. But food price rise has made the situation more acute. By the end of 2020, global consumer food prices were the highest in six years. In the first four months of 2021, they continued to rise.
- **Dip in people's affordability of healthy food:** There is a significant dip in people's affordability for healthy food due to a loss in income. The pandemic led to an additional 141 million people being unable to afford a healthy diet in the countries studied.
- **Healthy diet costs more:** The cost of a healthy diet was 60% more than a diet that just meets "requirements for essential nutrients" and almost five times as much as a diet that just meets "the minimum dietary energy needs through a starchy staple".
- **Undernourishment:** The increase in the number of undernourished during the pandemic was more than five times greater than the highest increase in undernourishment in the last two decades.

Current Framework for Food Security in India:

- **Constitutional Provision:** Though the Indian Constitution does not have any explicit provision regarding right to food, the fundamental right to life enshrined in Article 21 of the Constitution can be interpreted to include the right to live with human dignity, which may include the right to food and other basic necessities.
- **Buffer Stock: Food Corporation of India (FCI)** has the prime responsibility of procuring the food grains at minimum support price (MSP) and stored in its warehouses at different locations and from there it is supplied to the state governments in terms of requirement.
- **Public Distribution System:** Over the years, Public Distribution System has become an important part of Government's policy for management of the food economy in the country. PDS is supplemental in nature and is not intended to make available the entire requirement of any of the commodity.
 - Under the PDS, presently the commodities namely wheat, rice, sugar and kerosene are being allocated to the States/UTs for distribution.
 - Some States/UTs also distribute additional items of mass consumption through the PDS outlets such as pulses, edible oils, iodized salt, spices, etc.
- **National Food Security Act, 2013 (NFSA):** It marks a paradigm shift in the approach to food security from welfare to rights based approach.
- The introduction of the **One Nation One Ration Card (ONORC) scheme** is an innovation that can be a game-changer, allowing beneficiaries to access their food entitlements from anywhere in the country.

NFSA covers 75% of the rural population and 50% of the urban population under:

- **Antyodaya Anna Yojana:** It constitute the poorest of-the-poor, are entitled to receive 35 kg of foodgrains per household per month.
- **Priority Households (PHH):** Households covered under PHH category are entitled to receive 5 kg of foodgrains per person per month.
 - The eldest woman of the household of age 18 years or above is mandated to be the head of the household for the purpose of issuing ration cards.
- In addition, the act lays down special provisions for **children between the ages of 6 months and 14 years old**, which allows them to receive a nutritious meal for free through a widespread network of **Integrated Child Development Services (ICDS) centres, known as Anganwadi Centres.**

Challenges to food security in India:

- **Climate change will continue to affect agriculture and food security**, and the impact on the poor and vulnerable can be devastating.
- **A third of all food produced is wasted.** Lost or wasted energy used for food production accounts for about 10% of the world's total energy consumption.
 - Further, the annual greenhouse gas emissions associated with food losses and food waste reach around 3.5 gigatonnes of the CO₂ equivalent.
- The **scale of India's public food distribution systems** is immense and has gone through **constant navigation and improvement, which is commendable.**
 - But more needs to still be done to improve access and inclusion among the missing vulnerable population.
 - Such as single women-led households, transgender persons, HIV-affected persons, displaced persons, refugees, and orphan children, etc.
- **The Comprehensive National Nutrition Survey 2016-18** revealed that over 40 million children are chronically malnourished, and more than half of Indian women aged 15-49 years are anaemic.

- In India, more than 86% of farmers have less than two hectares of land contributing around 60% of the total food grain production and over half the country's fruits and vegetables.
- **Intensified food production systems** with excessive use of chemicals and unsustainable farming practices cause soil degradation, fast depletion of groundwater table and rapid loss of agro-biodiversity.

Way Forward:

- **Revitalising Aadhaar Seeding of Ration Cards:** To speed up the process of Aadhaar linking to ration cards, ground monitoring measures must be taken that will ensure no valid beneficiary is left out of their share of food grains that can give thrust to the aim of zero hunger (Sustainable Development Goal- 2).
- **Direct Benefit Transfer (DBT) Through JAM:** There is a need to streamline food and fertiliser subsidies into direct benefit transfers to accounts of identified beneficiaries through **the JAM trinity platform (Jan Dhan, Aadhaar, and Mobile)** that will reduce huge physical movement of foodgrains, provide greater autonomy to beneficiaries to choose their consumption basket and promote financial inclusion.
- **Moving Towards Sustainable Farming :** For ensuring Food Security in India , improvement in productivity through greater use of biotechnology, intensifying watershed management, use of nano-urea and access to micro-irrigation facilities and bridging crop yield gaps across States through collective approach should be at priority.
- **Towards Precision Agriculture:** There is need to increase the use information technology (IT) in agriculture to ensure that crops and soil receive exactly what they need for optimum health and productivity.
- **Ensuring Transparency in Food Stock Holdings :** Using IT to improve communication channels with farmers can help them to get a better deal for their produce while improving storage houses with the latest technology is equally important to deal with natural disasters.
 - Further, foodgrain banks can be deployed at block/village level, from which people may get subsidised food grains against food coupons (that can be provided to Aadhar linked beneficiaries).
- **Addressing Issues With an Umbrella Approach:** By looking at diverse issues from a common lens, such as inequality, food diversity, indigenous rights, and environmental justice, India can look forward to a sustainable green economy.

Digital India Programme

Context: The Digital India Programme has made the country digitally empowered in the area of technology and innovation.

About the Digital India programme:

Digital India is a flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy. The programme was launched on July 1, 2015 by Hon' Prime Minister Shri Narendra Modi.

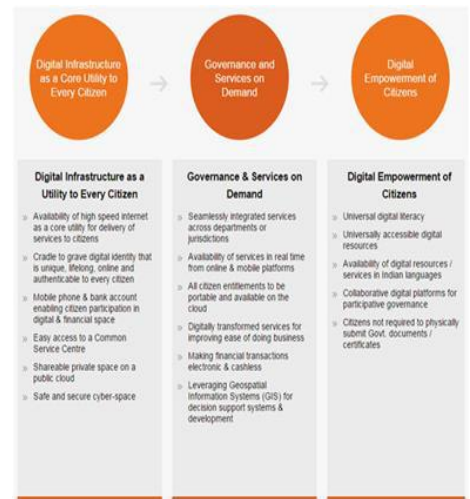
Outcomes of the programme:

- Digital India has considerably reduced the distance between the Government and citizens.
- It has also helped in the delivery of substantial services directly to the beneficiary in a transparent and corruption-free manner.

- In the process, India has emerged as one of the pre-eminent nations of the world to use technology to transform the lives of its citizens.

Significance of the Digital India campaign

- **Transparency:** The transparency that has come due to Digital India has eliminated corruption at various levels adversely affecting the poor and the middle class.
- **Direct Benefit Transfer:** In the last eight years, more than Rs 23 lakh crore has been transferred through Direct Benefit Transfer (DBT) to beneficiaries.
- **The trio of Jan Dhan, Mobile and Aadhaar, or JAM:** It has provided maximum benefit to the poor and the middle class.
- **Ending corruption:** The Digital India campaign has helped save Rs 2.25 lakh crore from falling into the wrong hands in the past eight years.
- **Eliminating middle-men:** Digital India has saved money for the common man by ending the network of middle-men
- **Digital India helped the government tackle the crisis arising out of the Covid pandemic:** CoWin and Aarogya Setu are two mobile applications that helped provide 200 crore vaccine doses.
- **Ending digital divide:** Digital India has also helped bridge the digital divide that exists between rural and urban India.



Challenges:

- **Gender gap:** Indian women are 15 per cent less likely to own a mobile phone and 33 per cent less likely to use mobile internet services than men.
 - Women constitute only one-third of internet users in India.
- **Skewed penetration:** Among states, Maharashtra has the highest internet penetration, followed by Goa and Kerala, while Bihar has the lowest, followed by Chhattisgarh and Jharkhand.
- **India’s global rank:** According to the UN’s e-participation index (2022), which is a composite measure of three important dimensions of e-government, namely provision of online services, telecommunication connectivity and human capacity, India ranks 105 out of 193 nations.
- **Online safety:** According to a survey, more than half of young women have experienced violence online, including sexual harassment, threatening messages and having private images shared without consent.
 - **Women’s rights defenders and female journalists** were targeted for abuse more than most.
- **Inadequate artificial intelligence:** The third threat comes from badly designed artificial intelligence systems that repeat and exacerbate discrimination.

Key initiatives undertaken by MeitY under the Digital India programme:

- **Aadhaar:** Aadhaar provides 12 digits biometric and demographic-based identity that is unique, lifelong, online and authenticable.
 - It has also given statutory backing through The Aadhaar (Targeted Delivery of Financial and Other Subsidies, Benefits and Services) Act, 2016.
 - Over 135.5 crore residents have been enrolled.
- **Unified Mobile Application for New-age Governance (UMANG):** For providing government services to citizens through mobile. More than 1668 e-Services and over 20,197 bill payment services are made available at UMANG.

- **Common Services Centres:** CSCs are offering government and business services in digital mode in rural areas through Village Level Entrepreneurs (VLEs).
 - Over 400 digital services are being offered by these CSCs.
 - So far, 5.21 Lakh CSCs are functional (including urban & rural areas) across the country.
- **Unified Payment Interface (UPI):** It is the leading digital payment platform. It has onboarded 376 banks and has facilitated 730 crore transactions (by volume) worth Rs 11.9 lakh crore.
- **Digi Locker:** Digital Locker provides an ecosystem with the collection of repositories and gateways for issuers to upload the documents in the digital repositories.
 - Digital Locker has more than 13.7 crore users and more than 562 crore documents.
- **e-Sign:** e-Sign service facilitates instant signing of forms/documents online by citizens in a legally acceptable form.
- **MyGov:** It is a citizen engagement platform that is developed to facilitate participatory governance. Presently, over 2.76+ crore users are registered with MyGov.
- **MeriPehchaan:** National Single Sign-on (NSSO) platform called MeriPehchaan has been launched in July 2022 to facilitate/provide citizens ease of access to government portals.
- **Jeevan Pramaan:** Jeevan Pramaan envisages digitizing the whole process of securing the life certificate for pensioners.
- **Pradhan Mantri Gramin Digital Saksharta Abhiyaan (PMGDISHA):** The Government has approved the scheme to usher in digital literacy in rural India.

Way Forward:

Need of the hour is to establish an empowered entity needs to be set up which is **accountable for quality and timeliness to design and construct digital highways**, and their rural branches, and ensure their **optimum utilisation by sharing the infrastructure**. Digital skills, required today both for **life and for livelihoods**, must be imparted on a war footing by transforming government digital literacy programmes into skilling missions, and expanding outreach, including through the private sector.

The Social media sites can use their **“algorithm power” to proactively tackle the issue of safety**. Thus, the government needs to strengthen laws that hold online abusers to account, and the public to speak up whenever they witnessed abuse online.

Need for heritage conservation

Context: The Janardana Temple in Kerala, the Haveli of Agah Khan in Agra and Gonpa complex in Ladakh are among the 14 ancient sites which have been declared protected by the Archaeological Survey of India over the last three years.

- The list of these monuments and sites has been declared protected under the Ancient Monuments and Archaeological Sites and Remains Act, 1958 was shared by Culture Minister in the Rajya Sabha.
- The other monuments and sites in the List Includes
 - The temple complex of Navratnagarh in Jharkhand’s Gumla district.
 - The group of monuments in Bolangir, Odisha.
 - Vishnu Temple in Pithorgarh, Uttarakhand.
 - Trilochannath Temple in Kathua, Jammu and Kashmir.
 - Udhampur are the sites which have been declared protected.
 - The Bori and surrounding archaeological remains in Neemrana Rajasthan.
 - Archaeological remains in Baghpat, Uttar Pradesh.
 - The archaeological sites and remains of Ashwamedh Yagna.

- Village Virbhadrā in Dehradun
- Rangdum Monastery in Kargil, Ladakh.
- Hathi Khana' in Agra.
- Also, the government has provided ₹15,622 lakhs over the last three years as grant to **Zonal Cultural Committees** to strengthen the **micro-culture in the country**.
- Out of which, ₹5,881.46 lakh has been allotted in the year 2021-22.

About Ancient Monuments and Archaeological Sites and Remains Act (AMASR), 1958:

- The Act was introduced in 1958 for safeguarding the cultural heritage of the country.
- The main objective of the act is to protect ancient and historical monuments and archaeological sites and remains of national importance.
- The act also regulates the archaeological excavations and the protection of sculptures, carvings and other like objects.
- The Act prohibits construction in 'prohibited areas', an area of 100 meters around protected monuments.
- The central government can extend the prohibited area beyond 100 meters.
- The Archaeological Survey of India functions under the provisions of the act.

About Archaeological Survey of India (ASI) and National Monuments Authority (NMA):**Archaeological Survey of India**

- It is a premier organization under the **Ministry of Culture, for the archaeological research and protection of the cultural heritage of the nation**.
- It regulates **all archaeological activities** in the country as per the provisions of the **Ancient Monuments and Archaeological Sites and Remains Act, 1958**.
- It also regulates the **Antiquities and Art Treasure Act, 1972**.
- It was **founded in 1861 by Alexander Cunningham**– the first Director-General of ASI.
- Alexander Cunningham is also known as the **"Father of Indian Archaeology"**.

National Monuments Authority

- National Monuments Authority (NMA) under the **Ministry of Culture, Govt. of India** has been setup as per provisions of **The Ancient Monuments and Archaeological Sites and Remains AMASR (Amendment and Validation) Act, 2010** which was enacted in March, 2010.
- Several functions have been assigned to the NMA for the protection and preservation of monuments and sites through management of the prohibited and regulated area around the centrally protected monuments.
- The Act provides for NMA to be constituted with a **Chairperson and up to 5 Whole Time and 5 Part Time Members** each and a Member Secretary.
- **DG ASI is an ex officio Member**.

About Zonal Cultural Centres:

- The Zonal Cultural Centres (ZCCs) were set up in the mid-80s to develop the cultures of various regions and also to set up mechanisms for preservation and promotion of various elements of India's rich cultural heritage as autonomous bodies.
- The ZCCs were required to concentrate on the folk arts, dance and music.
- The mandate behind setting up the ZCCs was to bind the nation culturally while retaining the individuality of the regions that comprise them.

Significance of AMASR Act:

- When a monument is declared protected under the AMASR Act then the maintenance of the monument is taken over by the Archaeological Survey of India.
- Construction activities in and around the monument or site are regulated and no construction is permitted without prior permission of concerned authorities.
- The area extending to 200 meters around the monument in all directions is called a regulated area.
- As per the AMSAR (Amendment and Validation) Act, 2010 construction is prohibited within a 100-meter periphery of a protected area.



ECONOMY

**Minimum Tax on Big Businesses**

Context: Members of the European Union agreed in principle to implement a **minimum tax of 15% on big businesses**.

Last year, 136 countries had agreed on a plan to redistribute tax rights across jurisdictions and enforce a minimum tax rate of 15% on large multinational corporations.

What is Base erosion and profit shifting (BEPS)?

- BEPS refers to tax planning strategies used by multinational enterprises that exploit gaps and mismatches in tax rules to avoid paying tax.
- Although some of the schemes used are illegal, most are not
- BEPS practices cost countries USD 100-240 billion in lost revenue annually.
- Working together within **OECD/G20 Inclusive Framework on BEPS**, over 135 countries and jurisdictions are collaborating on

What are the concerns with BEPS?

- **Reduced Tax Revenue:** Developing countries' higher reliance on corporate income tax means they suffer from BEPS disproportionately.
- **Disproportionately impacts domestic small firms:** Such tax planning strategies undermines the fairness and integrity of tax systems because businesses that operate across borders can use BEPS to gain a competitive advantage over enterprises that operate at a domestic level.
- **Sets wrong precedent:** Moreover, when taxpayers see multinational corporations legally avoiding income tax, it undermines voluntary compliance by all taxpayers.

What is OECD's Global Tax Plan ?

- EU members have agreed to implement a minimum tax rate of 15% on big businesses in accordance with **Pillar 2** of the global tax agreement framed by the Organisation for Economic Cooperation and Development (OECD) 2021.
- Under the OECD's plan, governments will be **equipped to impose additional taxes** in case companies are found to be paying taxes that are considered too low.
- This is to ensure that big businesses with global operations do not benefit by domiciling themselves in **tax havens** in order to save on taxes.

- Pillar 1 of the OECD's tax plan, on the other hand, tries to address the question of **taxing rights**. Large multinational companies have traditionally paid taxes in their home countries even though they did most of their business in foreign countries.
- The OECD plan tries to give more taxing rights to the governments of countries where large businesses conduct a substantial amount of their business.
- As a result, large U.S. tech companies may have to pay more taxes to governments of developing countries.
- It is estimated that the minimum tax rate would boost global tax revenues by \$150 billion annually.

Why is there a need for a global minimum tax?

- Corporate tax rates across the world have been dropping over the last few decades as a result of competition between governments to spur economic growth through greater private investments.
- Global corporate tax rates have fallen from over 40% in the 1980s to under 25% in 2020, thanks to **global tax competition** that was kick-started by former U.S. President Ronald Reagan and former British Prime Minister Margaret Thatcher in the 1980s.
- The OECD's tax plan tries to put an end to **this "race to the bottom"** which has made it harder for governments to collect revenues required to fund their rising spending budgets.
- The minimum tax proposal is particularly relevant at a time when the fiscal state of governments across the world has deteriorated as seen in the worsening of public debt metrics.

What lies ahead?

- Some governments, particularly those **of traditional tax havens, are likely to disagree** and stall the implementation of the OECD's tax plan.
- High tax jurisdictions like the EU are more likely to fully adopt the minimum tax plan as it saves them from having to compete against low tax jurisdictions.
- Low tax jurisdictions, on the other hand, are likely to resist the OECD's plan **unless they are compensated sufficiently** in other ways.
- It should be noted that, even within the EU, countries such as Poland have already tried to stall the adoption of the global minimum tax proposal citing various non-economic reasons.
- Since the OECD's plan essentially **tries to form a global tax cartel**, it will always face the risk of losing out to low-tax jurisdictions outside the cartel and cheating by members within the cartel.
- After all, countries both within and outside the cartel will have the incentive to boost investments and economic growth within their respective jurisdictions by offering lower tax rates to businesses. This is a structural problem that will persist as long as the global tax cartel continues to exist.

What are the implications of OECD's tax plan?

- Supporters of the OECD's tax plan believe that it will end the global "race to the bottom" and help governments collect the revenues required for social spending.
- Many believe that the plan will also help counter rising global inequality by making it tougher for large businesses to pay low taxes by availing the services of tax havens.
- Critics of the OECD's proposal, however, see the global minimum tax as a threat. They argue that without tax competition between governments, the world would be taxed a lot more than it is today, thus adversely affecting global economic growth
- In other words, these critics believe that it is the threat of tax competition that keeps a check on governments which would otherwise tax their citizens heavily.

E-Rupee

Context: Reserve Bank of India (RBI) has announced the launch of India's much-awaited Central Bank Digital Currency (CBDC), **E-Rupee**, a sort of official cryptocurrency, **for retail users from December 1.**

- RBI defines the CBDC as the digital form of currency notes issued by a central bank. It is a sovereign or entirely independent currency issued by the central bank (in this case, RBI), in accordance with the country's monetary policy.

What is the retail e-Re?

- E-Rupee (e-Re) is the common name associated with CBDC or central bank digital currency. It is a **digital form of legal tender or currency.**
- E-Re could be wholesale and retail. A pilot for the wholesale was launched on November 1, while that for the retail version was on December 1.
- Four banks – SBI, ICICI Bank, IDFC First Bank and YES Bank – will participate in the first phase of the pilot and 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.
- Just like how telecom operators launch products, e-Re will also be **tested on closed user groups** or CUGs.
- The pilot phase is aimed at customers of those banks roped in for the project, as the aim is to test the efficacy of the product.
- Eventually, the retail version of e-Re can be used by individuals for all transactions, where they use cash to buy things, to give to friends or relatives, to repay debt, etc.
- While there are no specific transaction limits in value or volume terms, in the initial phases, e-Re may be limited to low-ticket usages.

How will e-rupee work?

- Consider cash being consumed out of the digital wallet instead of physical wallets; that's the way e-Re would function and it would bear the sovereign stamp.
- In the **pilot phase, e-Re would be a push product.** Banks would send out a link to identified customers through an email or text message, whereby the e-Re app could be downloaded.
- Using the mobile number, the customer verification or KYC would be conducted and upon successful completion of KYC, the digital wallet is good to use.
- The user will then be able to **transfer money from the bank account to the wallet.** Simply put, instead of withdrawing money from an ATM, you are transferring money into a digital wallet.
- The amount transferred would assume the exact denominations of physical cash and **will not earn interest** when parked in the e-wallet.
 - RBI is **not in favour of e-rupee with interest.** Because people might withdraw money from banks and convert it to digital rupee – causing banks to fail.
- Therefore, how much non-interest generating money would a user be willing to accommodate would be a determining factor to gauge the acceptance of e-Re.

Why is the RBI moving towards the e-Re?

- e-Re seems to be a natural next step in the evolution of official coinage (from metal-based money, to metal-backed banknotes, to physical fiat money)
- There is a cost incurred in printing, transporting and storing currencies and coins that can be rationalised through e-Re.

- 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**. Likewise, it is not aimed at just smartphone users, but every person with a mobile phone.
- The e₹ can be converted to any commercial bank money or cash. It would be a fungible legal tender for which holders need not have a bank account – hence, strengthening the cause of **financial inclusion**. Therefore, e-Re would aid in formalising the **digital consumption** of money.
- More importantly, it would provide the general populace an **alternative to unregulated cryptocurrencies** and their associated risks.
- It will add **efficiency to the settlement system** and boost innovation in cross-border payments space and provide the public with uses that any private virtual currencies can provide, without the associated risks.
- Issuing CBDC allow central banks to **more effectively satisfy public policy goals**, including operational efficiency, financial stability, monetary policy effectiveness, and financial integrity.
 - The RBI had stated that the key motivations for exploring the issuance of CBDC in India among others include reduction in operational costs involved in physical cash management, fostering financial inclusion, bringing resilience, efficiency and innovation in the payments system.

What are the challenges with retail e-Rupee?

- From a customer perspective, UPI has established ease of use. Therefore, e-Re needs to prove that it is equally user-friendly with sound technology and data privacy provisions, to lure users.
- Users also face **digital theft** such as hacking and virus attacks, which could deter some people.
- The cultural and social mind-set in the country, which leads to greater use of physical currency, is also a hindrance.

India's Cooperative Sector

Context: The Bill to amend the Multi-State Cooperative Societies (MSCS) Act, 2002, was introduced in the Lok Sabha on the first day of the Winter Session on 07 December 2022.

What is the history of India's cooperative movement?

- India's cooperative movement originated in the agriculture and related sectors as a means for farmers to pool their resources to prevent exploitation by money lenders.
- India's cooperative movement was formalised at the end of the 19th century, inspired by the German model of agricultural credit banks.
- After Independence, the framers of the Constitution placed **cooperatives in the State list**. They came to be considered instruments of socio-economic development and became an essential focus of the initial Five-Year Plans. As a result, States made their own laws to regulate cooperatives within their jurisdiction.
- **Article 43B of Indian Constitution** inserted by the **97th Amendment** says that "states shall endeavour to promote voluntary formation, autonomous functioning, democratic control and professional management of cooperative societies".
- According to the **Ministry of Cooperation**, there are around 8.5 lakh cooperatives in India, with about 1.3 crore people directly attached to them.
 - Union government has created a new Ministry of Cooperation in 2021 for strengthening cooperative movement
- Today, Cooperatives in India range from those providing credit to those producing, procuring, or marketing products like fertilisers, milk, sugar, and fish.

- Indian Farmers Fertilisers Cooperative (IFFCO) has around a third of the market share in fertilizers, while Gujarat's Amul is a highly profitable dairy cooperative.

What are Multi-State Cooperative Societies?

- Cooperatives are a state subject, but there are many societies such as those for sugar and milk, banks, milk unions etc whose **members and areas of operation are spread across more than one state**.
- For example, most sugar mills along the districts on the Karnataka-Maharashtra border procure cane from both states. They draw their membership from both states, and they are thus registered under the **Multi-State Co-operative Societies Act, 1984 (amended in 2002)**
- Their **board of directors has representation from all states** they operate in.
 - The board of directors are from all the States these collectives operate in and controls all finances and administration function.
- Administrative and financial regulation & monitoring of these societies is with the **central registrar**, with the law making it clear that **no state government official can wield any control** on them.
- Since the law was enacted, **1,479 such societies have been registered**, of which 9 have been deregistered since.
- Maharashtra has the highest number at 567, followed by Uttar Pradesh (147) and New Delhi (133).
- Credit societies constitute the bulk of registered societies at 610, followed by agro-based ones (which include sugar mills, spinning mills etc) at 244. There are 96 multistate cooperative dairies and 66 multistate cooperative banks.

What are the issues with the cooperative sector?

- As envisioned by the Indian constitution, the independent and **autonomous character** of cooperative societies was crucial to their functioning.
- However, as **government and legislative control** of cooperatives increased over the years, there were increasing reports of mismanagement and corruption.
- Their inclusion in the planning process as development instruments made the sector an **avenue for dispensing patronage** to the supporters of ruling political parties, either by way of nomination to governing boards or sanctioning schemes specific to the cooperatives.
- Also, providing various forms of **financial assistance** enabled State governments, "in the name of public interest," to **directly intervene** in the working of cooperatives which are legally autonomous.
 - Not surprisingly, the most successful Indian cooperatives such as the AMUL, Indian Farmers Fertiliser Cooperative Limited (IFFCO) and Krishak Bharati Cooperative Limited (KRIBHCO), are outside government control.
- Globally, seven of the top 10 cooperatives by asset size are from the **financial sector**. The Indian financial sector is nowhere in the picture going by asset size.
- When a cooperative bank scales up, maintaining its cooperativeness is a challenge. Cooperatives have also become avenues for regulatory arbitrage, circumventing lending and **anti-money laundering regulations**.
- MSCSs are facing **issues regarding trust**, which is the very basis of cooperation. MSCSs were, therefore, brought under the Prevention of Money Laundering Act, 2002 in 2018, and all urban and MSCS banks were brought under the radar of the Reserve Bank of India in 2020.
- These developments have brought MSCSs under **multiple controls from the Centre**, giving rise to fears that monitoring would take a top-down approach as opposed to a grassroots one.

- Cooperative banking **suffered from the top-down quality**. Recent initiatives such as an umbrella organisation for urban cooperatives and a new Ministry of Cooperation at the Centre threaten to further this approach in the absence of safeguards.

What are the key provisions of the proposed Multi-State Cooperative Societies (Amendment) Bill, 2022?

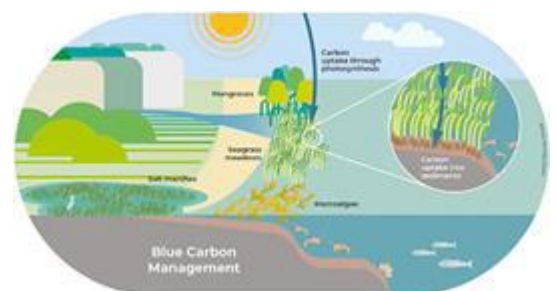
- To plug the “loopholes” in the MSCS Act, the Centre introduced a Bill seeking to amend the 2002 law for more “transparency” and increase the “ease of doing business”.
- The amendments have been introduced to improve governance, **reform the electoral process**, strengthen monitoring mechanisms and enhance transparency and accountability.
- The Bill provides for the creation of a **central Co-operative Election Authority** to supervise the electoral functions of the MSCSs.
- The Bill also seeks to **improve the composition of the board** and **ensure financial discipline**, besides enabling the raising of funds in MSCSs.
- It envisages the creation of a **Co-operative Rehabilitation, Reconstruction and Development Fund** for the revival of sick MSCSs, financed by existing profitable MSCSs which will have to deposit either Rs. 1 crore or 1% of their net profit.
- In order to make the governance of these societies more democratic, transparent and accountable, the Bill has provisions for appointing a **Cooperative Information Officer** and a **Cooperative Ombudsman**.
- To promote equity and inclusiveness, provisions relating to the **representation of women and SC/ST members** on MSCS boards have been included.
- The Bill makes only members eligible to be elected to the board or as office bearers of the cooperative society.
- The Bill also increases the penalty amount for violation of the law to Rs. 1 lakh and potential imprisonment from six months to a year.

India's Blue Carbon Potential

Context: Environmental Experts suggested that India must adopt blue-carbon solutions if it intends to emerge as a global climate leader. India's commitment to its 2070 net-zero target entails that it must explore all blue carbon interventions to their fullest.

About Blue Carbon:

- The term “blue carbon” refers to the carbon stored in coastal and marine ecosystems.
- The so-called blue carbon ecosystems – mangroves, tidal and salt marshes, and seagrasses – are highly productive coastal ecosystems that are particularly important for their capacity to store carbon within the plants and in the sediments below.
- Scientific assessments show that they can sequester two to four times more carbon than terrestrial forests and are thereby considered a key component of nature-based solutions to climate change.



Significance of Blue Carbon in mitigating climate change:

- Large 7,500+ kilometers-long coastline: India could presently have about 5,000 sq. km of mangroves, 500 sq. km of seagrasses, and around 300 to 1400 sq. km of salt marshes.
- Mangroves, seagrasses and salt marshes can capture carbon dioxide (CO₂) up to 20 times greater than any other terrestrial ecosystem, including boreal and tropical forests.

- Coastal ecosystem's total carbon sequestration potential has been estimated at around 700 million tons of CO₂ about 22 percent of India's annual carbon emission.

Challenges in utilization of India's blue carbon potential:

- The 'Nature' journal mentions India as a 'blue carbon wealth recipient country' instead of a blue carbon 'donor'
- Journal suggests an underutilisation of blue carbon resources in India.
- India's 'Long-Term Low-Carbon Development Strategy' document submitted to the United Nations Framework Convention on Climate Change (UNFCCC) is not focusing on blue carbon opportunity.
- The absence of a clear pathway for the restoration of blue carbon storage assets can be a major source of carbon emissions in the future.

Way Forward:

There is a need for National mission on Blue Carbon with the following objectives:

- Mission can define the phase-wise strategies for value-chain development for acquiring knowledge, manpower, money, and materials that can stimulate the country's collective efforts.
- Mission can identify the potential demand generation actions like blue carbon obligations while pushing to put in place the key enablers for domestic and international players in this space.
- To streamline the technological developments with financial and policy interventions in the blue-carbon sector.
- Mission can decide national targets for relevant sectors that contribute towards the development of a blue-carbon ecosystem.
- Mission can be instrumental in setting up a robust carbon market in the country.
- Mission can launch pilot projects with the private sector/NGOs/Think Tanks while ensuring appropriate monitoring, compliance, and risk-mitigation guidelines.

Textile Industry in India

Context: The textile industry is coming under greater Environmental, social and governance (ESG) scrutiny. Traceability in supply chain and recycling of textile waste are vital going forward.

About Textile Industry in India:

- The Indian textile and apparel market is currently estimated at over **\$150 billion, of which, export constitutes over \$40 billion.**
- A recent report pointed out that the global textile and apparel trade is set to reach **\$1,000 billion by 2025-26** and that in the same period the **Indian textile and apparel market will reach \$250 billion.**
- **India holds a 4% share of the U.S.\$840 billion global textile and apparel market, and is in fifth position.**
- It contributes **3% to Indian Gross Domestic Product, 7% of Industrial Output, 12% to the export earnings of India and employs more than 21% of total employment.**
- India is also the **second largest producer of silk** in the world and 95% of the world's hand woven fabric comes from India.
- India is the **6th largest producer of Technical Textiles with 6% Global Share, largest producer of cotton & jute in the world.**
- Technical textiles are functional fabrics that have applications across various industries including automobiles, civil engineering and construction, agriculture, healthcare, industrial safety, personal protection etc.

Significance of the sector:

- **Economical:** In 2019–20, the domestic textile and apparel market was worth \$150.5 billion.
- **Trade:** India registered \$ 41 bn in textile exports in CY 2021, with a CAGR (2.7) marginally higher than the global average.
- **Employment:** The second-largest employer in India, the textile and garment sector employs 100 million people in supporting sectors in addition to 45 million workers directly.
- **Raw material for other sectors:** Technical textiles are useful materials that are used in a variety of fields, such as automotive, civil engineering, healthcare, agricultural, personal protection, and construction.

Challenges faced by the textile sector:

- **Highly fragmented:** The unorganized sector and small and medium-sized businesses dominate India's textile industry, which is highly fragmented.
- **Outdated Technology:** Due to market competition and access issues, the Indian textile sector struggles to keep up with international standards. This is especially true of small-scale businesses.
- **Issues with Tax Structure:** The GST (Goods and Service Tax) tax structure makes clothing expensive and uncompetitive in both domestic and foreign markets. The threat of growing labor and worker salaries is another.
- **Exports Stagnant:** For the past six years, the sector's exports have stayed constant at a level of USD 40 billion.
- **Lack of Scale:** Bangladesh has at least 500 machines per factory on average, whereas the average size of the textile units in India is only 100, which is significantly smaller.
- **Lack of Foreign Investment:** One of the concerns is that there is a lack of foreign investment in the textile business because of the issues mentioned above.

Government of India initiatives to promote the growth of the Textile Industry:

- **The National Technical Textile Mission:** It seeks to enhance domestic technical textile consumption while establishing the nation as a global leader in the field. By 2024, it hopes to increase the size of the domestic market to between \$40 billion and \$50 billion USD.
- **Amended Technology Upgradation Fund Scheme (ATUFS):** In order to modernize the textile industry's technology, the government approved the "Amended Technology Upgradation Fund Scheme (ATUFS)" in 2015.
- **The Scheme for Integrated Textile Parks (SITP)** aims to help small and medium-sized textile business owners cluster investments in textile parks by providing financial support for the parks' top-notch infrastructure.
- **The SAMARTH (Scheme for Capacity Building in the Textile Sector):** The government started the SAMARTH Scheme for Capacity Building in Textile Sector (SCBTS) to alleviate the scarcity of trained people.
- **The North East Region Textile Promotion Scheme (NERTPS)** is a program that supports all areas of the textile industry with infrastructure, capacity building, and marketing assistance.
- **Power-Tex India:** It includes innovative power-loom textile research and development, new markets, branding, subsidies, and worker welfare programs.
- **The Silk Samagra Scheme** seeks to lessen the nation's reliance on imported silk by enhancing the quality and productivity of domestically produced silk.
- **ICARE Jute:** This pilot initiative, which was started in 2015, aims to help jute growers overcome their challenges by offering certified seeds at discounted prices and by popularizing many recently developed retting technologies under water-restrictive conditions.

- **PM Mega Integrated Textile Region and Apparel (PM MITRA) Parks:** It aims to integrate the entire textile value chain from spinning, weaving, processing/dyeing, printing to garment manufacturing at one location.

Way Forward:

India needs to frame a suitable policy whereby the Indian textile industry can contribute to advancing our energy transition commitment. To achieve the sustainable target, it is necessary to adopt good regulatory practices and increased focus on quality, compliance and investment.

As part of this, we need policies to encourage recycling of discarded textiles. This is important given the socio-economic status of the country and income disparities. Recently, Bangladesh's readymade garments initiated 'green manufacturing' practices to help conserve energy, water, and resources. India could bring such initiative into action to combat sustainability of textile industry.

Sustainable practices such as **regenerative organic farming, sustainable manufacturing energy** (renewable sources of energy are used) and circularity are needed to be adopted to make textile industry sustainable. The Indian government is committed to promoting sustainability through project sustainable resolution.

Role of micro financial Institutions in financial inclusion

Context: In recent times, Microfinance institutions have been increasingly adopting technology to enhance operational efficiency, improve underwriting models and reduce expenses.

About Microfinance:

- Microfinance is a **banking service provided to unemployed or low-income individuals or groups** who otherwise would have no other access to financial services.
- Microfinance **allows people to take on reasonable small business loans safely**, and in a manner that is consistent with ethical lending practices.
- The term "**microfinancing**" was first used in the **1970s** during the development of **Grameen Bank of Bangladesh**, which was founded by Muhammad Yunus.
- Today, microfinance is available in nearly 85 per cent districts of India with more than two lakh frontline employees distributing credit and associated services.

Benefits of Microfinance:

- **Financial Inclusion:** Microfinance has emerged as one of most important tools to foster financial inclusion.
 - It enables the poor and low-income households to come out of poverty, helps women to become owners of assets, has an increased say in decision making and leads dignified lives embodying the concept of a collective good.
- **Inclusive Growth:** Microfinance plays a critical role in promoting inclusive growth by making credit available at the last mile and therefore, acts as a safety net for those at the bottom of the pyramid.
 - Microfinance loans provide financial access to the poorest that allows many of them to start new businesses, grow existing businesses, insure against shocks due to bad weather and illness, and smooth consumption.
- **Adopting Tech:** MFIs (microfinance institutions) have been increasingly adopting technology to enhance operational efficiency, improve underwriting models and reduce expenses while continuing the focus on customer-centricity.
 - Audio-visual content in vernacular languages is widely utilised to continuously impart financial literacy.

- **Improve Underwriting Models:** A separate credit bureau for microfinance was established about a decade back.
 - Intense efforts by MFIs and credit bureaus have led to the development of robust databases and a credit bureau report is an essential part of underwriting now.
- **Expanding Reach of Microfinance:** In terms of reach, microfinance operations cover 28 states and 9 union territories (UTs).
 - In terms of regional distribution, eastern & north-eastern regions of the country have the largest share at 37 per cent followed by south at 27 percent and west at 15 per cent.
 - Thus, in impacting the lives and livelihoods, the role of microfinance continues to be important. While microfinance is present in almost all nooks and corners of the country, in terms of geographical distribution, 82 per cent of the loan portfolio is concentrated in ten states.
- **Strong Customer Protection:** The RBI regulations for microfinance provide an effective framework for customer protection.
 - This framework is supported by the RBI recognised self-regulatory organisation (SRO).
 - The SRO supports the MFIs in the implementation of the regulations, takes initiatives for capacity building, improves governance through regular guidance and surveillance and provides a platform for resolving sector level challenges.
- **Digitalisation initiatives:** Digitalisation initiatives have been aligned with the rapid diffusion of smartphones and growing comfort of borrowers with digital modes of transactions.

Today, nearly 100 per cent of loans are digitally disbursed directly into the bank account of the borrowers and an increasing number of repayments are also being done digitally.

Challenges of micro financial institutions:

- **Fragmented Data:** While overall loan accounts have been increasing, the actual impact of these loans on the poverty-level of clients is not clear as data on the relative poverty-level improvement of MFI clients is fragmented.
- **Impact of Covid-19:** It has impacted the MFI sector, with collections having taken an initial hit and disbursements yet to observe any meaningful thrust.
- **Social Objective Overlooked:** In their quest for growth and profitability, the social objective of MFIs—to bring in improvement in the lives of the marginalized sections of the society—seems to have been gradually eroding.
- **Loans for Non-income Generating Purposes:** The proportion of loans utilized for non-income generating purposes could be much higher than what is stipulated by the RBI which is 30% of the total loans of the MFI.
 - These loans are short-tenured and given the economic profile of the customers, it is likely that they soon find themselves in the vicious debt trap of having to take another loan to pay off the first.

Way Forward:

The microfinance program has witnessed phenomenal growth in India in the last decade. However, the focus of most of the microfinance service providers has remained on expanding the outreach of microfinance programs with little attention to the depth, quality and viability of the financial services. The RBI should encourage all institutions to monitor their impact on society by means of a 'social impact scorecard'.

Carbon Trading

In News: Parliament passed the **Energy Conservation (Amendment) Bill-2022** that enables the Union government to set up a **carbon credit trading scheme** and specify the minimum amount of non-fossil sources to be used by designated energy consumers.

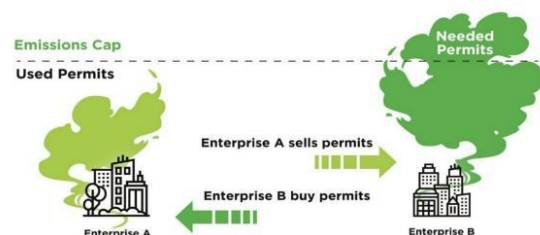
Context:

- India had taken the lead when it came to energy transition.
- As per India's commitments under the UNFCCC as given by the PM at COP-26 last year, the goal is to cut emission intensity by 45% and achieve 50% of the installed capacity of electricity generation from non-fossil fuel sources.

Energy Conservation (Amendment) Bill-2022

- The Bill amends the Energy Conservation Act-2001.
- The Central Electricity Regulatory Commission (CERC) would be the regulator and that the carbon price would be determined by the market.
- The Bill covers large buildings — those with connected load of 100 kilowatt and above — for compliance with energy conservation and sustainability codes.
- States had been empowered to lower the threshold to include a wider section of buildings.
- The Bill did not make a provision for those under the 100KW threshold who want to voluntarily submit to the energy conservation mechanism.

What is carbon trading:



- Carbon trading is the process of buying and selling permits and credits that allow the permit holder to emit carbon dioxide.
- It is a market-based system aimed at reducing greenhouse gases that contribute to global warming, particularly carbon dioxide emitted by burning fossil fuels.

- An emissions trading scheme (cap-and-trade system) sets a regulatory ceiling or 'cap' on greenhouse gas emissions being regulated under the scheme.
- The right to emit a tonne of CO₂ is often referred to as a carbon 'credit' or carbon 'allowance'.
- There are broadly two types of carbon markets: compliance and voluntary.
- Examples – **European Union's Emissions Trading System(ETS)**
- The **Clean Development Mechanism (CDM)**, adopted under the **Kyoto Protocol** in **1997**.
- Emission-reduction projects in developing countries have generated carbon credits used by industrialized countries to meet part of their emission reduction targets.

Significance:

- Help achieve current and future climate ambitions by tapping existing markets.
- Bring about development co-benefits: improve air quality and health outcomes and ensure energy security.
- Eg. trading in sulphur dioxide permits helping to limit acid rain in the US.
- Carbon trading is much easier to implement than expensive direct regulations, and unpopular carbon taxes.
- If regional cap and trade schemes can be joined up globally, with a strong carbon price, it could be a relatively pain-free and speedy method to help the worlds decarbonise.
- Boost competitive advantage of businesses by reducing risk of stranded assets.

Challenges:

- Creating a market in something with **no intrinsic value** such as carbon dioxide is difficult.
- Need to promote scarcity – and you have to strictly limit the right to emit so that it can be traded.
- In the world’s biggest carbon trading scheme, the EU ETS, **political interference** has created gluts of permits.
- On account of **corruption**, carbon credits have often been given away for free, which has led to a collapse in the price and no effective reductions in emissions.
- Another problem is that **offset permits**, gained from paying for pollution reductions in poorer countries, are **allowed to be traded as well**.
- The importance of these permits in reducing carbon emissions is **questionable** and the effectiveness of the overall cap and trade scheme is also reduced.
- **Greenwashing** – in which companies falsely market their green credentials, for example, misrepresentations of climate-neutral products or services
- **Double-counting** of GHG emission reductions

Way forward:

- As per latest IPCC report, developing countries will need up to US\$6 trillion by 2030 to finance not even half of their climate action goals (as listed in their Nationally Determined Contributions, or NDCs).
- Carbon finance will be key for the implementation of the NDCs, and the Paris Agreement enables the use of such market mechanisms through Article 6.
- 83 percent of NDCs state the intent to make use of international market mechanisms to reduce greenhouse gas emissions.

Fertilizer sector in India
SALE OF FERTILISERS IN LAKH TONNES

	APR-OCT 2021	APR-OCT 2022	% GROWTH
Urea	186.273	193.112	3.67
DAP	55.612	65.032	16.94
MOP*	16.877	8.792	-47.91
NPKS	71.875	57.553	-19.93
SSP	34.815	31.678	-9.01

*For direct application

In News: Data from the Department of Fertilisers shows a 3.7 per cent increase in the sale of urea during April-October 2022 over the corresponding seven months of the previous year. Even higher, at 16.9 per cent, has been the growth in DAP sales.

Context:

- For a long time, India’s fertiliser sector has been riddled with distortions from excessive use of **urea**.
- Now, there’s a second fertiliser — di-ammonium phosphate or **DAP** — that is seeing a similar phenomenon of **over-application due to under-pricing**.
- Hence, there is a need for balanced use of fertilizer in conjunction with bio fertilisers and organic fertilizers

Fertilizer sector:

- There are 3 basic types of fertiliser used—urea, Diammonium Phosphate (DAP), and Muriate of Potash (MOP).
- Urea is the most produced (86 per cent), most consumed (74 per cent share), and the most imported (52 per cent)
- It is the most physically controlled fertiliser and receives the largest subsidies (nearly 70 per cent of total fertilisers subsidy)
- DAP and MOP producers and importers receive a **Nutrient Based Subsidy (NBS) based** on a formula of N, P and K in 4:2:1 ratio.
- India is the **second biggest consumer** of fertilizer in the world next only to China.

- The India Fertilizers Market stood at **28.56 billion USD in 2022** and is projected to register a CAGR of 6.25% to reach 41.08 billion USD in 2028.
- **Sale of Urea and DAP** is rising while that of other fertilizers is falling.

Issues in the sector:

- **High government subsidies** such as on Urea and DAP. **5 percent of GDP**, the **second-highest** after food
- Companies are obliged to sell at MRP, with their higher cost of production or imports being reimbursed as subsidy by the Centre.
- **Heavy Import dependence:**
- **Entire potash** requirement, about 90 per cent of phosphatic requirement, and 20 per cent urea requirement is met through imports.
- The use of nitrogen (N), phosphorous (P) and potassium (K) in the country has over the last few years sharply deviated from the ideal NPK use ratio of 4:2:1.
- This causes worsening of soil quality
- **Imbalance in application:** MOP, which contains 60% K, has a high MRP so farmers have no incentive today to apply the same.
- **Environmental concerns: nutrient imbalance** owing to their use — disproportionate to other, more expensive fertilisers — could have **implications for soil health**, ultimately **affecting crop yields**.
- The India Fertilizers **Market is fragmented**, with the top five companies occupying 28.93%.
- **Black market & corruption:**
- Urea is highly regulated and is only subsidised for agriculture
- This creates a black market that burdens small farmers disproportionately; incentivises production inefficiency, leads to over-use, depleting soil quality and damaging human health.

Way forward:

- Fertiliser subsidies are very costly, accounting for about 0.8 per cent of GDP
- They encourage urea overuse, which damages the soil, undermining rural incomes, agricultural productivity, and thereby economic growth.
- Reform of the fertiliser sector would not only help farmers and improve efficiency in the sector. It would also show that India is prepared to address exit constraints that bedevil reform in other sectors.

Regenerative Farming

Context: Recently, the experience of farmers in Madhya Pradesh who follow regenerative farming methods finds the reduced need for frequent irrigation which conserves water and energy.

Promising numbers
Trials of regenerative agriculture in Madhya Pradesh and Maharashtra have saved 14.5 billion litres of water

Activities followed under regenerative agriculture	Water saved across farms (billion litres)	Share (%) in total saving
Change in cropping pattern	5.53	37.0
Dry sowing	4.01	26.8
Soil fertility interventions	3.03	20.2
Drip irrigation	1.16	7.7
Change in crop variety	0.99	6.6
System of wheat intensification, Line sowing	0.21	1.4
Sprinkler	0.03	0.3
Total	14.5	100

Source: Samaj Pragati Sahayog



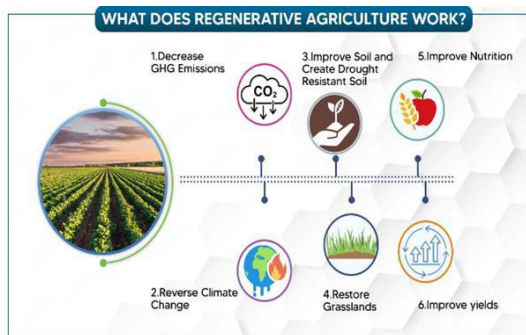
About Regenerative Farming:

- It is a **farming and grazing practices** that benefits by reversing climate change, by rebuilding soil organic matter and restoring degraded soil biodiversity.

- It aims to **improve soil and water for better agriculture** in future by **increasing soil organic matter**.
- It uses methods of **chemical-less farming** by using natural inputs, manures, mulching and cultivation practices such as **crop rotation, diversification, multi-cropping, sowing of diverse and native varieties**.
- Natural inputs help improve soil structure and its organic carbon content.
- Planting **water-guzzling and water-efficient crops** together or in alternating cycles reduces the frequency and intensity of irrigation.

Need of Regenerative agriculture in India:

- **Soil degradation:** Agriculture today, including the use of heavy machinery, fertilizers and pesticides to maximize food production, is contributing to soil degradation and loss.
 - Within 50 years, there may not be enough soil left to feed the world, according to the regenerative farming organization Regeneration International.
- **Climate Change:** Intensive farming also churns up CO2 naturally stored in soil and releases it into the atmosphere. This contributes to the global warming that is driving climate change.



- Agriculture accounts for over a third of greenhouse gas emissions globally, according to the United Nations (UN).

- **Extreme events:** Damaged soil and eroded land can make environments more vulnerable to extreme weather events like flooding, which are increasing in frequency and intensity as the Earth warms.

Major Challenges associated with Agriculture

- According to the **UN’s World Water Development Report, 2022**, the country extracts 251 cubic km or more than a quarter

of the world’s groundwater withdrawal each year.

- **90 per cent of this water is used for agriculture.**
- **No gain in production:** A study by the **Indian Institute of Technology, Delhi**, shows that **over 39 million hectares (ha) of area in the country under wheat, rice and maize** have not shown improvement in the past decade.
- **Groundwater:** The **Green Revolution of the 1960s** pulled India from the brink of starvation, transformed the country’s ability to feed itself and turned it into a big food exporter.
 - But the revolution also made India the **world’s biggest extractor of groundwater**.
- **Degrading soil health:** A 2022 report by Delhi-based think tank **Centre for Science and Environment (CSE)**, State of Bio Fertilizers and Organic Fertilizers in India, shows the severe and widespread deficiency of organic carbon and micronutrients in Indian soils.
- **Lack of scientific study:** Civil society organizations and farmers do not have the capacity to conduct long-term studies.

Way Forward:

In India, the Union government is promoting regenerative agriculture with an aim to reduce application of chemical fertilisers and pesticides and to lower input costs. States like **Uttarakhand, Himachal Pradesh, Andhra Pradesh, Sikkim and Gujarat** too have introduced schemes to promote it.

According to the **UN Food and Agriculture Organization**, healthy soil helps in better **water storage, transmission, filtering and reduces agricultural run-off**. Studies have established that **one per cent increase in soil organic matter (an indicator of soil health) per 0.4 ha increases water storage potential by more than 75,000 litres**.

Thus, the concerted research is required to understand the role of regenerative agriculture in saving water. The scientific findings will further help inform policy measures and future initiatives.

Securities and Exchange Board of India (SEBI) extends trading ban on Agri commodities

Context: Recently, SEBI has extended the ban on futures trading in seven Agri commodities, including the derivatives of two produce which has been in force since December 20, 2021.

- SEBI extended the ban on trading in **non-basmati paddy, wheat, chana, mustard seeds and its derivatives, soyabean and its derivatives, crude palm oil and moong** on concerns that **lifting the curbs will lead to inflation.**



About Commodity Trading:

- A commodity market is a market that trades in **primary rather than manufactured products.**
- Soft commodities are **agricultural products such as wheat, coffee, cocoa and sugar.**
- Hard commodities are **mined, such as gold and oil.**
- Commodity markets can include physical trading and derivatives trading using spot prices, forwards, futures, and options on futures.
 - Farmers have used a simple form of derivative trading in the commodity market for centuries for price risk management.
- There is a huge difference in the trading volume of commodities and the actual value of the commodities in physical form — this is because of hedging undertaken by several participants.

Commodity Market in India:

- **Commodity Market:** Commodities market is either a physical or a virtual space, where interested parties can trade commodities (raw or primary products) at present or future date. The price is dictated by the economic principles of supply and demand.
- **Regulator:** Till 2015, the market was regulated by the **Forward Markets Commission** which was **finally merged with SEBI** to create a unified regulatory environment for commercial investing.
- **Types of Commodity Market:** Typically, commodity trading occurs either in derivatives markets or spot markets-
 - **Spot markets** are also known as **“cash markets” or “physical markets”** where traders exchange physical commodities, and that too for immediate delivery.
 - **Derivatives markets** in India involve two types of commodity derivatives: Futures and Forwards; these derivatives contracts use the spot market as the underlying asset and give the owner control of the same at a point in the future for a price that is agreed upon in the present.
 - When the contracts expire, the commodity or asset is delivered physically.

Reasons for the ban on these commodities:

- The Centre, in particular, and SEBI have extended the ban on **concerns over inflation.**
- While surging edible oil prices resulted in imposing the ban last year, this year high rice and wheat prices have forced the Centre to extend the same.
- Rice prices have increased by 7.5 per cent and those of wheat by 15.5 per cent in the past year.
- Though consumer inflation dropped to 5.9 per cent in November from the highs of over six per cent in the previous months, the RBI feels it is **“down but not out”.**

Impact of the ban in the market:

- Prices of mustard seed and its derivatives, soyabean and its derivatives, and crude palm oil have dropped.
- On the other hand, prices of moong and chana are ruling higher currently compared with the year-ago period as also those of rice and wheat.
- Oilseed prices have declined mainly since edible oil supplies are no more a concern.

Benefits and need for Commodity Trading:

- Protection against inflation, stock market crash etc.
- Transparency and Fair Price Discovery
- High leverage facility
- No Insider Trading
- Seasonality Patterns and diversification
- No Counter party Risk (since there are Clearing Houses)
- Decrease the risk of cartelization

Disadvantages of commodity trading:

- **Not necessarily immune to inflation:** Price inelasticity means that while the price increases or decreases, the supply of the commodity remains unchanged.
- **High Volatility:** The prices of commodities are highly volatile and depend on demand and supply factors. The supply and demand of commodities are price inelastic.
- **Not ideal for diversification:** The common consensus is that there is a negative or low correlation between the prices of commodities and the prices of stocks.

Way Forward:

Therefore, sometimes these bans can be detrimental to the Indian commodity markets, severely denting the perception of ease of doing business in the country. There is need for detailed discussion and research should be carried out for such extension.

Commodity derivatives give important cues on price discovery and price risk management to the entire value chain participants across farmers, processors, millers, traders in physical markets and farmer producers' organizations.



INTERNATIONAL RELATIONS

**India-Australia Economic Cooperation and Trade Agreement:**

Context: The India-Australia Economic Cooperation and Trade Agreement (IndAus ECTA) has recently come into effect. The ECTA was signed on April 2, 2022, and was ratified on November 21, 2022.

About Indo-Aus Bilateral Trade:

- India is the 5th largest trade partner of Australia with trade in goods and services at A\$ 29 billion representing 3.6% share of the total Australian trade in 2017-18, with export at A\$ 8 billion and import at A\$ 21 billion.
- Indian exports: India's main exports to Australia are Refined Petroleum, medicaments, Railway vehicles including hover-trains, Pearls & Gems, Jewellery, and made-up textile articles.
- Indian imports: Imports are Coal, copper ores & concentrate, Gold, vegetables, wool & other animal hair, fruits and nuts, lentils and education-related services.

About Indo-Aus ECTA:**Benefits for India:**

- India will benefit from preferential market access provided by Australia on 100% of its tariff lines, including all the labour-intensive sectors of export interest to India, such as Gems and Jewellery, Textiles, leather, footwear, furniture among other, the commerce ministry said.

Benefits for Australia:

- India will be offering preferential access to Australia on over 70% of its tariff lines, including lines of export interest to Australia, which are primarily raw materials and intermediaries such as coal, mineral ores and wines

Protection to few products:

- Products like agricultural products and the dairy sector – which were very sensitive for India and without which Australia has never done an agreement before – have been protected.

Employment generation:

- It is estimated that an additional 10 lakh jobs would be created in India under ECTA.

Visa Quotas:

- Indian yoga teachers and chefs are set to gain with the annual visa quota.

Post-study work visa:

- Over 1 lakh Indian students would benefit from a post-study work visa (for 18 months to 4 years) under the ECTA.

Double Taxation Avoidance Agreement (DTAA):

- The Australian Parliament has also approved an amendment to the Double Taxation Avoidance Agreement (DTAA), a move which would help the Indian IT sector in operating in that market.
- It would stop the taxation on the offshore income of Indian firms providing technical support in Australia.

Challenges:

- India's trade deficit with Australia has been increasing since 2001-02 due to India-Australia Free Trade Agreement.

Way Forward:

- The cooperation and coordination between the two countries have seen exponential momentum in recent years. The shared values, interests, geography, and objectives are the foundation of deepening India-Australia relations. Both India and Australia share a vision of a free, open, inclusive, and rules-based Indo-Pacific region.
- India and Australia believe in cooperative use of the seas by following International law including the United Nations Convention on the Law of the Sea (UNCLOS) and peaceful resolution of disputes rather than through unilateral or coercive actions. The India-Australia ECTA will enhance the already close and strategic relations between the two countries.

India and G20 Presidency

Context: On December 1, India assumed the presidency of the G20 forum, taking over from Indonesia. Prime Minister Narendra Modi called it a “huge opportunity for India”.

What is the History of G20?

- The G20 forum was established in 1999 by the finance ministers and central bank governors of seven countries – Canada, France, Germany, Italy, Japan, the U.K., and the U.S. after a meeting in Washington DC.
- The uniting factor was the **1997–98 South –East Asia financial crisis and its aftermath.**
 - The 1997–98 Asian financial crisis began in Thailand and then quickly spread to neighbouring economies. It began as a currency crisis when Bangkok unpegged the Thai baht from the U.S. dollar, setting off a series of currency devaluations and massive flights of capital.
- The G20 comprises Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, the Republic of Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, the U.K., the U.S. and the European Union
- The representatives met in Berlin, Germany, for the first annual meeting of the group. The first meeting of G20 leaders took place in 1999, and it was elevated to the level of heads of government/State in 2008.
- The primary aim of G20 was to **secure global financial stability** by involving middle-income countries.
- In 2009, G20 was designated the “premier forum for international economic cooperation”.
- The forum initially dealt with matters related to macroeconomics, but over the years, its agenda has expanded to cover issues relating to trade, climate change, sustainable development, health, agriculture, energy, environment, climate change, and anti-corruption.
- G20 was considered as an acceptable medium between the more “elitist” G-7 (then the G-8 due to Russia), and the more unwieldy 38-member Organisation for Economic Co-operation and Development (OECD)
- Over the past two decades, the global economic balance has shifted, and the G-20 has been seen as a more representative and egalitarian grouping of global leadership, and was particularly useful in steering the global economy after the global financing crisis and banking collapse of 2008.
- At its 2009 summit, the G20 declared itself the primary venue for international economic and financial cooperation. The group’s stature has risen during the subsequent decade, and it is recognized by analysts as exercising considerable global influence.
- Today, G20 members account for more than 80% of the world’s GDP, 75% of global trade and 60% of the population of the planet.

How does the G20 work?

- The group does not have a permanent secretariat.

- Processes under G20 are divided into two parallel tracks – the finance track and the sherpa track. The finance track is led by finance ministers and central bank governors of member nations, who meet throughout the year.
- Sherpas, who are personal emissaries of leaders, lead the sherpa track. They oversee negotiations all through the year, discussing agenda items for the summit and coordinating the substantive work of the G20.
- In addition to Summits and Sherpa meetings (that help in negotiations and building consensus), various other events and group meetings are also organised throughout the year.
- Working groups designed around specific themes operate within both tracks. These include representatives from relevant ministries of member nations and invited/guest countries too.
- Various international organisations, like the United Nations, International Monetary Fund, and the Organisation for Economic Co-operation and Development also participate in working groups.
- This year's working groups will cover topics like financial inclusion, digital economy, and environment and climate sustainability.

How does G20 Presidency work?

- The **presidency of the G20 rotates every year among members**, and the country holding the presidency, together with the previous and next presidency-holder, forms the '**Troika**' to ensure continuity of the G20 agenda.
- India will assume the **presidency of the powerful G20 grouping from the current chair, Indonesia, on December 1**, and hold the post for a year.
- During India's presidency, **India, Indonesia and Brazil will form the troika**.
- This would be the first time when the **troika would consist of three developing countries and emerging economies**.
- During the course of its G20 Presidency, India will be holding about 200 meetings in 32 different sectors in multiple locations across India.

What role can India play as the G20 President-nation?

- India's G20 Presidency is a unique **opportunity to showcase India's strengths** to the entire world.
- G20 Presidency would help showcase parts of India **beyond the conventional big metros**, thus bringing out the uniqueness of each part of our nation.
- Apart from hosting the summit and setting the theme, the G20 presidency does not come with any formal powers.
- However, **India plans on showcasing its philosophies** of Vasudhaiva Kutumbakam (one earth, one family, one future), and LiFE (Lifestyle for Environment) through the theme and the logo of the event.
- India's G20 presidency is "striving for just and equitable growth for all in the world, as we navigate through these turbulent times, in a sustainable, holistic, responsible, and inclusive manner," an official statement said.
- Given the large number of visitors who would be coming to India during India's G20 Presidency, there is huge **potential for promoting tourism** and boosting the local economies of the venues where G20 meetings would be organized.
- The G20 presidency will also see India entrenching its credentials as a **digital superpower** which can leverage its unique digital public goods for benefits of people across geographies.
- **Transforming G20 into a people-led movement** for creating better lives of people could potentially become a lasting legacy of India's G20 presidency.

- India’s own **problems with China**, also a part of the G20 group, pose a potential platform for the effective redressal of conflicting issues.
- The long-term enduring legacy of India’s G20 presidency will be the **prioritisation of the interests of the developing world** and the Global South on the G20 agenda.
 - Making global financial governance institutions more democratic and representative of ongoing shifts in the world order will be a major priority of India under its G20 presidency.
 - Institutions such as the World Bank and IMF continue to remain the bastion of the West and need to provide greater representation and weight to emerging and developing countries in order to stay relevant.
 - As India will be leading G20 at a time of escalating global tensions, it will have to take the lead in forging an inclusive and equitable world order, with reformed multilateralism at its core.
- India’s G20 presidency is an unprecedented opportunity to shape the global narrative in **favour of reducing the carbon footprint** and encouraging green energy and digitalisation as significant components of transformational changes.
- India’s G20 presidency should be also used to pursue its thought leadership role and the broader goal of reducing polarisation, channelise resources in an inclusive manner, and firm up optics in favour of developmental priorities.

Free Trade Agreements regime

Context: In recent times, the Indian government has been actively pursuing free trade agreements (FTAs) with a wide range of countries.

About Free Trade Agreement (FTA):

- A free trade agreement is a pact between two or more nations to reduce barriers to imports and exports among them.
- Goods and services can be bought and sold across international borders with little or no government tariffs, quotas, subsidies, or prohibitions to inhibit their exchange.
- The concept of free trade is the opposite of trade protectionism or economic isolationism.



Different Types of Economic Engagements:

- **Preferential Trade Agreement (PTA):** In a PTA, two or more partners agree to reduce tariffs on an agreed number of tariff lines. The list of products on which the partners agree to reduce duty is called a positive list. India MERCOSUR PTA is such an example. However, in general PTAs do not cover substantially all trade.
- **Free Trade Agreement (FTA):** In FTAs, tariffs on items covering substantial bilateral trade are eliminated between the partner countries; however, each maintains an individual tariff structure for non-members.
 - For example India – Sri Lanka FTA.
- **Common Market:** Integration provided by a Common market is one step deeper than that by a Customs Union.

- A common market is a **Customs Union** with provisions to facilitate free movements of labour and capital, harmonize technical standards across members etc.
- For example **The European Common Market** is an example.
- **Economic Union:** Economic Union is a Common Market extended through further harmonization of fiscal/monetary policies and shared executive, judicial & legislative institutions.
 - **European Union (EU)** is an example.
- **Comprehensive Economic Cooperation Agreement (CECA) and Comprehensive Economic Partnership Agreement (CEPA):** These terms describe agreements which consist of an integrated package on goods, services and investment along with other areas including IPR, competition etc.
 - The India Korea CEPA is one such example and it covers a broad range of other areas like trade facilitation and customs cooperation, investment, competition, IPR etc.
- **Custom Union:** In a Customs union, partner countries may decide to trade at zero duty among themselves, however they maintain common tariffs against the rest of the world.
 - Example **Southern African Customs Union (SACU)** amongst South Africa, Lesotho, Namibia, Botswana and Swaziland.
 - The European Union is also an outstanding example

Significance of FTAs:

- FTAs give businesses and consumers improved access to a wider range of competitively priced goods and services, new technologies, and innovative practices.
- FTAs help to obtain more benefits from foreign investment.
- FTAs promote regional economic integration and build shared approaches to trade and investment between the trading partners.
- FTAs can deliver enhanced trade and investment opportunities that contribute to the economic growth of less-developed economies.
- FTAs support stronger people-to-people and business-to-business links that enhance overall bilateral relationships with FTA partners.
- FTAs can continue to provide additional benefits to the trading partners over time, including via in-built agendas that encourage ongoing domestic reform and trade liberalisation.

Major Challenges in adopting FTAs:

- **Protectionist Tendencies:** Moves such as plans to raise import duties on “non-essential items”, will only expose the government to the charge of being protectionist.
 - The first two decades after 1991-92 saw a steep decline in tariff rates.
 - The trend, however, has been reversed under the ruling government with the average applied import tariff actually rising. But still challenges remain.
- **Demographic dividend:** These Non-tariff issues could pose hurdles for India in reaping the gains of its comparative labour advantage.
- **Shift of focus:** Wrapping up these FTA talks could narrow soon given that India’s focus would shift to the series of events linked to India’s G20 Presidency.
- **Influential lobbies can delay it more:** Political lobbying from influential lobby groups such as farmer unions and the auto sector could intensify.
- **Priority to non-tariff issues:** In much of the negotiations currently under discussion, climate action, carbon emissions and labour issues are taking precedence over trade issues.

- **GSP (Generalised System of Preferences):** Currently, we may benefit from the GSP but if they come in a non-tariff barrier by citing labour or environment, then it becomes an issue citing standards, adjustments, child labour as reasons.
 - **India had been a beneficiary of the US' GSP programme** since November 1975, under which beneficiary countries are allowed to export thousands of products to the US without the added burden of duties.
- **Recessionary conditions:** These could potentially offer partner countries a handle to trigger non-tariff protectionist measures as developed nations stare at recessionary conditions.
- **Environmental issues:** Developed countries such as the US have brought up the issue of carbon emissions in the process of manufacturing melted steel as a non-tariff-related issue.
 - India mostly produces steel generated from iron ore which comes from mining.
 - **Most developed countries** have resorted to methods to **generate it from scrap** which results in **lower carbon emissions**. Thus, there may be a **levy of carbon adjustment tax**.
- **Carbon Border Adjustment Mechanism:** The European Union has proposed CBAM to tax carbon-intensive products, such as iron and steel, cement, fertiliser, aluminium and electricity generation from 2026.
 - EU importers will buy carbon certificates corresponding to the carbon price that would have been paid, had the goods been produced under the EU's carbon pricing rules.

Way Forward:

The trade policy framework must be accompanied by economic reforms that result in an open, competitive, and technologically advanced economy. Therefore, country looking for FTAs must focus on inclusion of entrepreneurs in global economic networks that will also allow them to pursue greater financial security. The Committee on Commerce should be tasked with scrutinizing FTAs, discussing different aspects of agreements and negotiations, thus ensuring executive accountability to the legislature



HISTORY AND ART & CULTURE

**B R Ambedkar and Women Empowerment****Context:**

- In *Madness of Manu*, feminist sociologist Sharmila Rege argues that mainstream feminism falls short in understanding the difference between the lives of Phule (Mali caste) and Ambedkar (Mahar caste) as members of OBC and Dalit communities.
- The entitlements, access to resources and spaces, poverty and humiliation are distinct for those who are destined to live outside of village boundaries and treated as beasts of burden.
- So, Ambedkar's role in the anti-caste struggle and women's empowerment must be closely studied.

Meaning of feminism:

- 'Feminism' is a wide range of political movements, ideologies and social movements that share a common goal to define, establish, and achieve political, economic, personal and social equality of sexes.
- The underline premise of feminism is to seek women's equality and justice in every sphere of life and create opportunities for women to have the same access to the resources that are otherwise freely available to men.

Feminist movements in India:

- **Chipko Movement** (March 1974)
- A group of 28 women, led by Gaura Devi in Uttarakhand's Garhwal region clung to trees to prevent them from being felled.
- The movement followed the Gandhian Satyagraha style of non-violent protests and became a benchmark for several future environmental movements.
- **Narmada Bachao Andolan** (1985)
- It was focused on the displacement of 250,000 people due to construction of a multi-crore project involving dams over the Narmada River.
- The Narmada Bachao Andolan has won the Right Livelihood Award in 1991 and enjoys the support of the international community.

Role of Ramabai Ambedkar:

- Ramabai Ambedkar is referred to as "Ramai" – Rama plus "aai" (mother in Marathi) with Ambedkar as Baba — father.
- She is the representative of the tough mother that working-class families know.
- When Ambedkar went away to Columbia, in his absence, his wife ran the household, took wage jobs, and faced starvation at times.
- What she performed was not merely a wifely duty, but it was **her contribution to her community and a partnership in social change.**

Ambedkar – As a feminist:

- Ambedkar urged people to **burn the Manusmriti**, which humiliated women, and shudras.
- In a speech in **1936, to communities of Joginis and Devadasis** — who typically belonged to the Dalit community — Ambedkar urged these women to fight the regressive religious practice of offering pubescent girls to gods in temples and become "sexually available for community members

As a policy-maker:

- **The Hindu Code Bill**
- It revolutionised the Hindu domestic sphere by offering women the right to marry by choice and across caste boundaries, give them the right to divorce, and the right to inherit property.
- The Bill became the law in a piecemeal, diluted avatar, in the form of the Hindu Marriage Act, Hindu Succession Act etc.
- He resigned when the Bill was stalled by the upper caste orthodoxy.
- His influence also led to the passage of various other pro-women acts like **The Equal Remuneration Act, 1976**, and **The Dowry Prohibition Act of 1961**, legally entitling women to equal wages and criminalising dowry, respectively.

As an Activist of women's rights:

- Ambedkar felt women, once they become agents of their own fate, will dismantle the caste patriarchy.
- He wrote extensively on women's oppression and set up newspapers like 'Mook Nayak' and 'Bahishkrit Bharat' with sections that exclusively covered women-centric issues.
- Ambedkar pushed for family planning measures for women, and ensured the enactment of **universal adult franchise**, thereby legalising voting rights for women and several other minorities and marginalised people.
- Ambedkar's contribution to women's emancipation is reflected in his In his criticism of texts like Manusmriti.

**ENVIRONMENT****Deforestation in Amazon Basin**

Context: Recently, a report released by the Amazon Network of Georeferenced Socio-Environmental Information in collaboration with MapBiomas shows that the Amazon region has lost 10% of its native vegetation in almost four decades. The forest area lost is mostly tropical rainforest and is roughly the size of Texas.

Key findings of the report:

- **Widening Deforested area:** From 1985 to 2021, the deforested area surged from 490,000 square kilometers to 1,250,000 square kilometers.
 - Brazil accounted for 84% of all forest destruction in this period.
- **Brazil leads with highest loss:** Brazil, which holds about two-thirds of the Amazon, also leads the destruction.
 - In almost four decades, 19% of Brazil's rainforest has been destroyed.
 - Almost half of Brazil's carbon emissions come from deforestation.
 - The forest destruction is mainly due to cattle ranching expansion supported by the opening of roads.
- **Impact on Carbon Emissions:**
 - At least some 75 billion metric tons of carbon are stored across the Amazon.

- If all that carbon ended up immediately in the atmosphere, that would be about seven times global annual emissions.

About the Amazon Rainforests and Amazon basin:

Amazon Rainforests

- These are the world's largest tropical rainforests occupying the drainage basin of the Amazon River and its tributaries in northern South America.
- As of 2021, the Amazon had 74% of its area covered by tropical rainforests and 9% of other natural vegetation types.
- They are home to nearly a fifth of the world's land species and over 45 million people.
- The rainforest of the Amazon is home to 400–500 indigenous Amerindian tribes.
- It is the source of 20% of the oxygen used by the planet.
- Tropical forests are closed-canopy forests growing within 28 degrees north or south of the equator.
- They are very wet places, receiving more than 200 cm rainfall per year, either seasonally or throughout the year.
- Temperatures are uniformly high – between 20°C and 35°C.



The Amazon Basin

- The basin covers over 6 million square km, nearly twice the size of India.
- It is bounded by the Guiana Highlands to the north, the Andes Mountains to the west, the Brazilian central plateau to the south, and the Atlantic Ocean to the east.
- It comprises about 40% of Brazil's total geographical area.
- The basin produces about 20% of the world's flow of freshwater into the oceans.

Significance of Amazon Rainforests in the basin countries:

- **Source of rich biodiversity:** The Amazon forests are highly biodiverse and a wide range of flora and fauna species can be found in the Amazon than in any other terrestrial ecosystem in the world.
 - It is estimated to contain up to 30 percent of all species.
- **Precipitation and climate control:** The Amazon rainforest produces between 50 and 75 percent of the world's precipitation through transpiration.
 - Rainfall in the Western United States and Central America is influenced by moisture from the Amazon.
 - The hydrological cycles that depend on the forests, the Amazon's canopy cover plays an important role in regulating temperature and humidity and is intricately linked to regional climate patterns.
- **Carbon sink potential and a natural air purifier:** Massive amounts of carbon are sequestered by about 350 billion trees that make up the Amazon rainforest.
 - Over 85 billion tonnes of carbon are stored in forests which is more than a third of the carbon stored by tropical forests worldwide.
- **Local and regional benefits:** Millions of people in the Amazon Basin depend on the services provided by the forest and activities such as logging, collection of non-timber forest products.

- **Medicinal values and food security:** The Amazon provides 70% of the plants that are effective against cancer cells.
- Eighty percent of the different types of food we consume worldwide have their roots in the Amazon rainforest.

Concerns and threats to Amazon forests:

- Increased global temperatures coupled with El Niño Southern Oscillation (ENSO) have led to a significant impact on Latin American climate variability and experts predict that the rainforest will perish in just 100 years.
- Increased instances of forest fires, drought and unsustainable agriculture practices have led to massive loss of forest vegetation.
- Poaching, commercial fishing, bio-Piracy and Smuggling has led to decline in flora and fauna numbers rapidly. Many species have become extinct including Amazon River turtle “Paiche”.
- Developmental activities, industrial and mining activities in large forested areas have been responsible for at least 10% of the total deforested area.
- Clearing forests for Soy oil and Cattle ranching has led to a significant amount of vegetation loss — 1.5 acres are lost every second.

Way Forward:

The Amazon is on the verge of functional destruction; not just the Amazon rainforests, but other Southeast Asian forests have also turned into carbon sources in the last few years as a result of formation of plantations and fires. There is an imminent need to reverse the deforestation trends and save the planet which requires active participation of all stakeholders including governments, civil society, industries and corporations in a mission mode.

Importance of Soil Conservation and Management

Context: December 5 marks the **UN Food and Agriculture Organization’s World Soil Day**, and the theme this year is ‘**Soils: where food begins**’, which aims to “raise awareness of the importance of maintaining healthy ecosystems and human wellbeing by addressing the growing challenges in soil management, increasing soil awareness and encouraging societies to improve soil health”.

Introduction:

- Soil conservation promotes sustainable and economic development to meet the **New Sustainable Development Goals (SDGs)**:
 - **SDG 6 — Clean Water and Sanitation:** Through drainage and purification, soil helps to provide clean water for drinking and farming.
 - **SDG 13 — Climate Action:** Through sequestration, soil can play a pivotal part in combating climate change by reducing atmospheric carbon.
 - **SDG 15 — Life on Land:** Healthy soils are essential for sustainable management of forests, fighting desertification, and reversing land degradation.

Need For A Healthy Soil Ecosystem:

- Healthy soils are essential for survival. They support healthy plant growth to enhance both our nutrition and water percolation to maintain groundwater levels.
- Soils help to regulate the planet’s climate by storing carbon and are the second largest carbon sink after the oceans.
- They help maintain a healthy landscape that is more resilient to the impacts of droughts and floods. As soil is the basis of food systems, it is no surprise that soil health is critical for healthy food production.

Govt of India Initiatives for Soil Conservation:

- **Soil Health Card (SHC) Scheme:** The SHC is used to assess the current status of soil health, and when used over time, to determine changes in soil health.
 - The SHC displays soil health indicators and associated descriptive terms, which guide farmers to make necessary soil amendments.
- **Pradhan Mantri Krishi Sinchayee Yojana:** The initiative aims to prevent soil erosion, regeneration of natural vegetation, rainwater harvesting, and recharging of the groundwater table.
- **National Mission for Sustainable Agriculture:** It has schemes promoting traditional indigenous practices such as organic farming and natural farming, thereby reducing dependency on chemicals and other Agri-inputs, and decreasing the monetary burden on smallholder farmers.

International collaboration for soil conservation: The Food and Agriculture Organization of the United Nations (FAO) undertakes multiple activities to support the Government of India's efforts in soil conservation towards fostering sustainable agrifood systems such as-

- **Development of forecasting tools:** The FAO is collaborating with the **National Rainfed Area Authority and the Ministry of Agriculture and Farmers' Welfare (MoA&FW)** to develop forecasting tools using data analytics that will aid vulnerable farmers in making informed decisions on crop choices, particularly in rainfed areas.
- **Capacity Building for the adoption of sustainable and resilient practices:** The FAO, in association with the Ministry of Rural Development, supports the **Deen Dayal Antyodaya Yojana-National Rural Livelihoods Mission's (DAY-NRLM)** Community Resource Persons to increase their capacities towards supporting on-farm livelihoods for the adoption of sustainable and resilient practices, organic certification and Agri-nutri-gardens.
- **Working with states:** The FAO works in eight target States, namely, Madhya Pradesh, Mizoram, Odisha, Rajasthan, Uttarakhand, Chhattisgarh, Haryana and Punjab, for boosting crop diversification and landscape-level planning.
- In Andhra Pradesh, the FAO is partnering with the State government and the Indian Council of Agricultural Research (ICAR) to support farmers in sustainable transitions to agro-ecological approaches and organic farming.

Way Forward:

There is a need to **strengthen communication channels between academia, policymakers and society for the identification, management and restoration of degraded soils**, as well as in the adoption of anticipatory measures. Greater cooperation and partnerships are central to ensure the availability of knowledge, sharing of successful practices, and universal access to clean and sustainable technologies, leaving no one behind.

The consumers and citizens can contribute by planting trees to protect topsoil developing and maintaining home/kitchen gardens, and consuming foods that are mainly locally sourced and seasonal. Building the resilience of our ecosystems is critical to addressing the challenges of a changing climate.

The warming of Arctic Ocean and its impacts

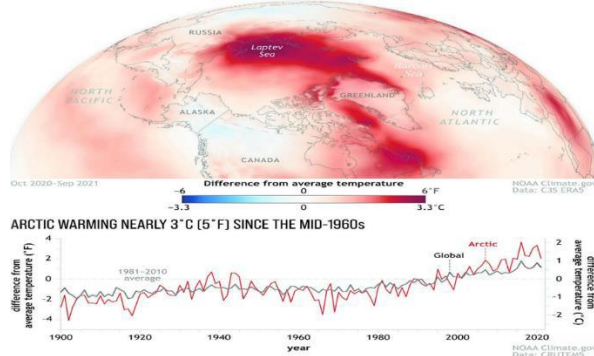
Context: Recently Finnish Meteorological Institute researchers published their study in the Communications Earth & Environment journal, concluding that the Arctic is heating four times faster than the rest of the planet.

- The warming is more concentrated in the Eurasian part of the Arctic, where the Barents Sea north of Russia and Norway is warming at an alarming rate — seven times faster than the global average.
- Nearly 150 experts from 11 nations compiled this year's assessment of Arctic conditions (the Arctic Report Card) which The National Oceanic and Atmospheric Administration have produced since 2006.

About Arctic Region:

- It is commonly understood to refer to the region above the **Arctic Circle, north of latitude 66° 34' N, which includes the Arctic Ocean with the North Pole at its centre.**

2021 WAS THE ARCTIC'S SEVENTH WARMEST YEAR ON RECORD



- **Eight Arctic States: Canada, Kingdom of Denmark, Finland, Iceland, Norway, Russia, Sweden, and USA form the Arctic Council.**

- The Arctic is home to **almost four million inhabitants**, of which approximately one tenth are considered as indigenous people.
- The Arctic Ocean and its surrounding landmass has been

a topic of immense interest and a high-priority area of research among the global scientific fraternity as well as of importance to policy makers.

- The Arctic influences atmospheric, oceanographic, and biogeochemical cycles of the earth’s ecosystem.

Major challenges associated with arctic warming:

- **Climate Change:** They described how hotter air temperatures, melting sea ice, shorter periods of snow cover, increased wildfire and rising levels of precipitation have forced wildlife and Indigenous people in the region to adapt.
- **Heat wave in Greenland:** It caused the most severe melting of the island’s ice sheet for that time of the year in over four decades of continuous satellite monitoring.
 - In 2021, an August heat wave had caused it to rain at the ice sheet’s summit for the first time.
- **Rising Temperatures are transforming the region’s climate** into one defined less by sea ice, snow, and permafrost and more by open water, rain, and green landscapes.
- **Warming at the top of the Earth raises sea levels worldwide**, changes the way heat and water circulate in the oceans, and might even influence extreme weather events like heat waves and rainstorms.
- **Rate of change:** Over the past four decades, the region has warmed at four times the global average rate. Some parts of the Arctic are warming at up to seven times the global rate.
- **Growth in green cover:** Rising temperatures have helped plants, shrubs and grasses grow in parts of the Arctic tundra.
 - Year 2022 saw levels of green vegetation that were the fourth highest since 2000 particularly in the Canadian Arctic Archipelago, northern Quebec, and central Siberia.
- **Reduced snow cover:** snow cover in the North American Arctic was the second-lowest on record. In the Eurasian Arctic, it was third lowest.
- The Greenland ice sheet has lost ice for the last 25 years.
- **Maritime ship traffic:** Scientists warned that maritime ship traffic is on the rise in the Arctic as sea ice declines, with the most notable increases in traffic occurring among ships travelling from the Pacific Ocean through the Bering Strait and Beaufort Sea.

Significant Implications:

- **Threat to humanity:** Our homes, livelihoods and physical safety are threatened by the rapid-melting ice, thawing permafrost, increasing heat, wildfires, and other changes.
- **Mineral Resources:** Arctic region has rich deposits of coal, gypsum and diamonds and substantial reserves of zinc, lead, placer gold and quartz. Greenland alone possesses about a quarter of the world’s rare earth reserves.

- **Hydrocarbons:** The Arctic also contains a wealth of hydrocarbon resources. India is the third-largest energy-consuming country in the world. The Arctic can therefore potentially address India's energy security needs.
- **Monsoons:** The link between the impact of the changing Arctic and monsoons in India is growing in importance due to the extreme weather events the country faces, and the heavy reliance on rainfall for water and food security.

India's Arctic policy:

- Institutional and human resource capacities will be strengthened within Government and academic, research and business institutions.
- Inter-ministerial coordination in pursuit of India's interests in the Arctic.
- **Enhancing understanding of the impact of climate change in the Arctic on India's climate, economic, and energy security.**
- Contributing better analysis, prediction, and coordinated policymaking on the implications of ice melting in the Arctic on India's economic, military, and strategic interests related to global shipping routes, energy security, and exploitation of mineral wealth.
- Studying linkages between polar regions and the Himalayas.
- Deepen cooperation between India and countries of the Arctic region under various Arctic forums, drawing expertise from scientific and traditional knowledge.
- **Increase India's participation in the Arctic Council** and improve understanding of the complex governance structures in the Arctic, relevant international laws, and geopolitics of the region.

India's Arctic policy would play an essential role in preparing the country for a future where humankind's biggest challenges, such as climate change, can be addressed through collective will and effort.

Way Forward:

The problem is that we do not completely understand the factors that control how rapidly the ice flows and thus enters the ocean. One way to approach the problem of not understanding the process is to study how sea level changed in the past. Earth is nearly as warm now as it was during the last interglacial period, about 125,000 years ago. World must act urgently to **reduce and mitigate the impact of human-made climate change on the glaciers.**

About National Oceanic and Atmospheric Administration:

- It is an American scientific and regulatory agency within the United States Department of Commerce that forecasts weather, monitors oceanic and atmospheric conditions, charts the seas, conducts deep sea exploration, and manages fishing and protection of marine mammals and endangered species in the U.S. exclusive economic zone.
- NOAA's five fundamental activities are:
 - I. Monitoring and observing Earth systems with instruments and data collection networks.
 - II. Understanding and describing Earth systems through research and analysis of data.
 - III. Assessing and predicting the changes in these systems over time.
 - IV. Engaging, advising, and informing the public and partner organizations with relevant information.
 - V. Custodianship of environmental resources.

Compensatory Afforestation Fund Management and Planning Authority (CAMPA)

Context: Recently, the Union government said that Funds from Project Tiger as well as the Compensatory Afforestation Fund Management and Planning Authority (CAMPA) were used to finance the project to bring African cheetahs to India.

About CAMPA Funds:

- Establishment in 2004, the **Ministry of Environment and Forests constituted the Compensatory Afforestation Fund Management and Planning Authority (CAMPA)** to oversee and manage the **Compensatory Afforestation Fund (CAF)** as directed by the Supreme Court.
- **CAMPA Act or Compensatory Afforestation Fund Act** is an Indian legislation that seeks to provide an appropriate institutional mechanism, both at the Centre and in each State and Union Territory,
 - to ensure expeditious utilisation in efficient and transparent manner of amounts released in lieu of forest land diverted for non-forest purpose which would mitigate impact of diversion of such forest land.

Objectives of CAMPA:

- The Funds are meant to promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses.
- **National CAMPA Advisory Council** has been established with the following mandate:
 - Lay down broad guidelines for State CAMPA.
 - Facilitate scientific, technological and other assistance that may be required by State CAMPA.
 - Make recommendations to State CAMPA based on a review of their plans and programmes.
 - Provide a mechanism to State CAMPA to resolve issues of an inter-state or Centre-State character.

About Project Tiger:

- It is a **Centrally Sponsored Scheme** launched in 1973.
- It has the aim of ensuring that the population of Bengal tigers is well-maintained in their natural habitats, this project continues to do everything possible to protect and save the tiger.
- **Tiger protecting force:**
 - The government has also set up a tiger protecting force that ensures there is no poaching of any kind or any human-tiger conflict.
 - This invariably will help in preventing tigers from being extinct.
- **Increasing the number of tigers:**
 - In 2006, surveys suggested that the number of tigers was just 1,411 which was a cause of concern worldwide.
 - In over a decade, India has seen a consistent rise in the number of tigers.
- **Tiger Reserves:**
 - There are **53 tiger reserves across 18 Tiger Range States** in India.

Objectives of Project Tiger:

- To ensure that any factor leading to the reduction of tiger habitats is limited.
- Any damages done to these habitats should be repaired so that the ecosystem is balanced
- Maintain a viable tiger population.

About Project Cheetah:

- The introduction of cheetahs in India is being done under Project Cheetah.
- It is the world's first intercontinental large wild carnivore translocation project.
- **Coexistence approach:**
 - India has opted for this approach.
 - It is even more unique because this is the first-time cheetahs will be reintroduced in an unfenced protected area (PA).
- **Significance of Coexistence approach:**

- The Coexistence approach is considered more favourable by social scientists.
- Fencing has proven to be a valuable tool in eliminating cheetahs' tendency to range over wide distances in **South Africa and Malawi**, thus allowing for population growth.
- The core conservation area of **Kuno National Park** is largely free of anthropogenic threats.
- **Challenges associated with Coexistence approach:**
 - **Kuno National Park** will be more challenging, as it is not enclosed / fenced.
 - There have been no successful cheetah reintroductions into unfenced systems.
 - Anthropogenic threats to cheetah survival include snaring for bush meat and retaliatory killings due to livestock depredation.
 - This would place them at the risk of human-related mortality including snaring and retaliatory killings by livestock farmers.

Way Forward:

CAMPA funds are meant for restoration of forests, particularly the ones that have been diverted for industrial purposes. There have been demands that this money should be given to **Gram Sabhas** so that they can be financially empowered to restore forests. Indigenous and forest-dwelling communities' country-wide are struggling for sustainable finance. Thus, these funds should be used to empower them.



SOCIETY & SOCIAL ISSUES

**Healthcare as a right: Rajasthan Right to Health Bill**

Context: In September 2022, the Rajasthan State government introduced the Rajasthan Right to Health Bill, 2022 in the state legislative assembly. It still being debated in the legislative assembly and has become a major part of public discourse among health care providers as well as different interest groups.

- Being the first such legislative action to have come from a state government, the decision carries with it both novelty and thus it becomes important to understand its legal dimensions, the short term and long term implications of its implementation.

Where can a right to health be located?

- **Article 21** of the Constitution protects and upholds the right to life and liberty. Courts have often taken a progressive stance in expanding the scope of the right to life to include the right to health.
- In **State of Punjab and Ors versus Mohinder Singh Chawla (1996)**, the Supreme Court proclaimed the right to life includes within its fold the right to health, and also pointed out the obligations of the government to provide health services.
- Courts have also taken recourse to the **Directive Principles of State Policy** to highlight the State's obligations in promoting and protecting the health of its citizens, particularly through **Articles 38, 41, 42 and 47** of the Constitution.
 - Article 38 says that the state to secure a social order for the promotion of welfare of the people
 - Article 41 says that the State shall make effective provision for securing the right to work, to education and to public assistance in cases of unemployment, old age, sickness and disablement, and in other cases of undeserved want.
 - Article 42 says that the State shall make provision for securing just and humane conditions of work and for maternity relief
 - Article 47 deals with the duty of the State to raise the level of nutrition and the standard of living and to improve public health
- In **State of Punjab versus Ram Lubhaya Bagga (1998)**, the Supreme Court held that every right had a corresponding duty, and in this case the right to life in Article 21 attracted the State's duty as mentioned in Article 47 in improving public health standards.
- In **Pashchim Banga Khet Mazdoor Samity versus State of West Bengal (1996)**, the Supreme Court had further opined that in the interest of improving public health, it is the government's responsibility to provide medical aid.
- Falling under Item 6 of the **state list in the Seventh Schedule of the Constitution**, the state governments have the duty to ensure the promotion of public health and provision of medical services.
 - In bringing forth the right to health bill, the Rajasthan government has acted on its constitutional mandate by providing health care services to residents of the state, while upholding the values laid out in multiple Supreme Court judgments in the past

What are the rights and duties prescribed in the Bill?

- The preamble of the Bill at the outset makes the intentions of the government clear -promoting health care without causing catastrophic out-of-pocket expenditure.

- In the **twenty rights** laid down for state residents in the Bill, we see principles of equity, justice and good conscience reflected, as were earlier perceived by the Supreme Court in the judgment referred to earlier.
- The Bill provides for **free and affordable health check-ups**, and surgery in both **private and public hospitals**. It makes it a **matter of right for the residents** to avail free services as laid down in various insurance schemes.
 - While this goes a long way in codifying what had earlier been perceived as mere expectations, the state takes the burden of providing adequate medical services to the residents.
- The Bill goes one step further in tackling another thorny issue of the right to medical information in medical establishments. The bill gives the residents the **right to seek information regarding the diagnosis and treatment**. At the same time, the Bill makes all such information confidential in nature.
- The Bill has also provided rights for health care providers such as **exemption from liability in bona fide acts**, a safe working environment, and access to protective gears.
- The Bill, in giving rights and duties to both sets of stakeholders, has sought to balance the counterclaims that could have made the implementation of a Right to Health Act problematic.
- While the residents have enough incentives and protection to seek medical care and information about the same, health care providers would not be at a disadvantage in doing their duty.
- If followed in other states, this balance of rights and duties can help in creating a robust health infrastructure and improving overall public health levels.

What are the governmental obligations provided in the Bill?

- With rights come duties, and this is visible in the Bill. The government would be obligated to
 - provide funds
 - set up institutions
 - Set up grievance redressal systems.
- The government has the responsibility to coordinate among different departments and offices for adequate and safe drinking water and sanitation.
- The Bill has set out the constitution of a **state health authority and district health authorities** to carry out functions such as formulating plans, assessing preparedness and developing systems for clinical, medical and social audits.
- The district health authority plays a greater role in the implementation of these plans.
- In creating this demarcation, the bill relies on the old **logic of decentralisation** where localised measures and strategies would be more cognisant of the problems and would be better able to provide solutions for the same.

Why is the Bill's bar on jurisdiction of civil courts controversial?

- The provision of this Bill that has received considerable backlash from the public is Clause 14, which **disallows any civil court to have jurisdiction** in matters where the appellate authority, as mentioned in the bill, has the power to decide matters.
- It has been argued that these appellate authorities would not have adequate resources or legal expertise to decide complicated matters, and such a blanket ban would go against the principles of justice.
- It also disallows the seeking of an injunction from any court against the actions carried out under the bill. This appears to be an **arbitrary restriction on the right to go to court**.
- In the absence of any scope for government intervention, it becomes extremely difficult to avoid the **threat of executive overreach or arbitrariness**.

- While the intent of the lawmakers might be in good faith to allow matters to be settled quickly without the costs and delays of the court process, it must not bar any recourse to judicial proceedings.

What is the major takeaway from the Bill?

- While there is still an absence of clarity on certain aspects of the Bill that require clarifications based on rules and regulations to be released later, the overall mandate of the government seems clear as far as providing **affordable medical care** to all residents.
- Other than a few problematic provisions such as the bar on jurisdiction of court, the Bill appears to be an **ideal starting point** for making the right to health a more attainable and tangible fundamental right.

National Tourism Policy

Context: Recently, a Report of the Department-related Parliamentary Standing Committee on Transport, Tourism and Culture was released.

- National Tourism Day is celebrated across the country on January 25 every year to appreciate India’s beauty and spread awareness about the importance of tourism and its impact on the economy.
- This year’s theme: for National Tourism Day is ‘Rural and Community Centric Tourism’.
- The central government is organizing the main event in Telangana’s Pochampally village, a weavers’ hamlet on the outskirts of Hyderabad.
- Known for its famous hand-woven Ikat sarees, Pochampally was selected as one of the best tourism villages by the United Nations World Tourism Organization (UNWTO) in 2021.

Tourism sector in India

- Travel and Tourism in India was the largest service industry: and was worth \$234 bn in 2018.
- According to The World Travel and Tourism Council (WTTC): the tourism industry in India generated \$194 bn or 6.8% of India’s GDP in 2019.
- The tourism sector in India: is predicted to grow at an annual rate of 6.9% to \$460 bn by 2028 which is 9.9% of GDP.

About National Tourism Policy:

- As per the draft National Tourism Policy, five key areas would be given significant focus in next 10 years that are:

- I. green tourism
- II. digital tourism
- III. destination management
- IV. skilling the hospitality sector and
- V. Supporting tourism-related MSMEs.
- VI. It include ‘perceptions related to safety and security’, and weak engagement between the Centre and the states.

VII. Government has also identified factors that hamper the growth of the tourism sector in the country.

VIII. It also mentions ‘the menace of touts’ and ‘low standards of cleanliness and hygiene’ as other factors that deter the industry from leveraging its full potential.

IX. To promote investment in the tourism sector, draft mentions granting of industry status to the sector, along with formally granting infrastructure status to hotels.

X. The draft policy offers framework conditions to help this sector, especially in the wake of the pandemic.



Tourism Industry

Key recommendations of committee:

- National Tourism Council (NTC): Government should create National Tourism Council (NTC) on the model of GST council.
- Aim: To give recommendations to the Central and State governments on various issues of the tourism sector and its stakeholders.

Tourism, Travel and Hospitality sector:

- Spending Capex above Rs. 25 crores will reduce operating costs for hospitality players through subsidized rates of electricity and water charges, property tax, development tax etc.
- It will also attract investments in the Sector.
- It praises eight States Maharashtra, Gujarat, Madhya Pradesh, Kerala, Karnataka, Punjab, Rajasthan and Uttarakhand which have accorded industry status to hospitality projects.

Tourism in Concurrent List:

- It recommended to include Tourism in concurrent list.
- It will help in simplifying issues of the pandemic-hit Indian tourism sector since tourism is a multi-sectoral activity.
- It raised concerns over delay in final UC (Utilization Certificate) submission in project.
- It includes projects like “Infrastructure Development at Puri, Shree Jagannath Dham-Ramachandi-Prachi River front at Deuli under Mega Circuit” of the PRASHAD Scheme and Integrated Development of tourist circuit around specific themes (SWADESH DARSHAN) has been pending since 2015.
- It recommends Ministry to identify the issues causing delay in payment of various expenditure items with the ITDC (India Trade Development Corporation).

Government of India's recent Initiatives:

Development of tourist's circuit around specific themes (SWADESH DARSHAN):

- Ministry should take the advantage of the regional, national and international linkages developed in North Eastern States so far in the tourism front.
- All the states and UT/s should be given the exact same amount as per its budgeted allocation.
- The Tourism Ministry has launched the Incredible India Tourist Facilitator Certification (IITFC) portal.
- It is an online programme where one can learn about tourism at their own time, space, path and pace.
- The successful completion of this programme would enable the learner to become a Certified Tourist Facilitator of Ministry of Tourism, government of India.
- Facilitative visa regime is a prerequisite for increasing inbound tourism.
- Ministry of Tourism takes the initiative with Ministry of Home Affairs and Ministry of External Affairs for achieving the same.
- The “Incredible India 2.0” Campaign of the Ministry marks a shift from the generic promotions being undertaken across the world to market specific promotional plans and content creation.
- Recently, in order to promote night tourism, the Culture Ministry has decided to open 10 historical monuments till 9 PM for common visitors across the country.
- Further, it urged all the states and UTs to open their important monuments till late night for visitors.
- Government promotes states to organize surveys in their respective states to understand how the foreign tourists perceive India and should work towards removing negative impressions.
- This will lead to change the perception of India in the mind of foreign tourists which will yield us good results for promotion of tourism.

Way Forward:

As a travel destination, few other nations can offer the diversity of products and experiences found in India. The travel and tourism industry offers significant opportunity for fulfilment of key national growth imperatives including employment generation across all regions of the country, and growth in the sector can contribute to overall economic development in the country. However, tourism in India, though growing consistently, is yet to realize its full potential due to several challenges that plagued the sector. Alleviation of these challenges will be essential for the industry to realize its full potential.

Languages of India

In News: The 11th volume of the Report of the Official Language Committee headed by Union Home Minister was submitted to President recently.

- The committee **recommended Hindi as the language of instruction and examinations in technical courses.**
- It has triggered angry reactions from the Chief Ministers of Tamil Nadu and Kerala, who have described the report as an attempt by the Union government to impose Hindi on non-Hindi-speaking states.

Languages of India:

- As per 2011 Census, India has **123** major languages, of which 30 were spoken by more than a million native speakers.
- Mother tongue survey of India- There are **19,500 “mother tongues”** – including 103 foreign mother tongues.
- **English** is used in higher education and in some areas of the Indian government.
- **Hindi** is the most spoken mother tongue or primary language (43.6%) and serves as the lingua franca across much of north and central India.
- **Hindi** is also the second most spoken language in the world, Bengali is at 7th and Punjabi at 10th.
- **Bengali** is the second most spoken primary language (8%), with a significant number of speakers in eastern and northeaster regions.
- Roughly, 12% of Indian speak **local, least recognised** languages
- There is **no official language** of India.
- India is home to the **Indo-Aryan and Dravidian** language families, two of the world’s largest.

Constitutional provisions on language:

- **Constituent Assembly:** The question of expressing national identity in a linguistically diverse society anxious was debated by the Constitution-makers and even linked to national prestige.
- The **Eighth Schedule** consists of the **22 languages** from length and breadth of the country.
- **Article 345** allows the **States to choose** their official language. Practically, many states have chosen English.
- **Article 348** mandates **English** language in all proceedings in the Supreme Court and High Court, Bills, acts, amendments, ordinances, rules, etc., until Parliament by law provides otherwise.
- Article 351 provides that it shall be the duty of the Union to **promote** the spread of **Hindi** as a medium of expression for all the elements of the **composite culture of India.**
- The Official Languages Act, 1963 and its Rules provide for the **continuation of English** language for **official purposes** of the Union and for use in Parliament.



Challenges of single language:

- **In Education:** Implications and practicality in terms of the availability of course material and of teachers qualified to communicate it adequately.
- Competence of candidates undertaking examinations in Hindi language and competing in equal measure with those whose mother tongue it is.
- Lack of proper curriculum
- **In Unity:** SK Dhar Commission set up in 1948 argued against a linguistic basis of reorganisation of states, as it could lead to further division
- **Linguistic chauvinism** i.e. exercising power and superiority of one language over others or having excessive pride in one's own language which may breed resentment and division.
- **Economic implications:** may reduce competitiveness in the job market since English is the global language

Way forward:

- Indian Union is an agglomeration of ethnolinguistic nationalities that have their own languages and cultures
- The unity of India would be strengthened through the acceptance of regional ambitions.
- All languages and mother tongues of India are a repository of its rich cultural heritage and must be encouraged and developed equally.

Addition of Tribes in ST List

Context: Recently, government has approved the inclusion of certain communities in the lists of Scheduled Tribes in Chhattisgarh, Tamil Nadu, Karnataka, Himachal Pradesh and Uttar Pradesh, fulfilling long-pending demands from these states which led to debates in the Parliament.

About newly added tribal groups:

Narikoravan and Kurivikkaran (Tamil Nadu): Nomadic tribes like the Narikuravas and Kuruvikaras (jackal catchers and bird eaters) pride themselves on their traditional occupations of hunting and gathering.

Gond Community (Uttar Pradesh): The Cabinet approved a proposal to bring the Gond community residing in 13 districts of Uttar Pradesh, under the ST list from the Scheduled Caste list.

- This includes the five subcategories of the Gond community (Dhuria, Nayak, Ojha, Pathari, and Rajgond).

'Betta-Kuruba' (Karnataka): The ST status granted to the Betta-Kuruba community as a synonym of Kadu Kuruba of Karnataka.

- Betta-Kuruba community has been demanding to include in the ST category for the last 30 years.

Hatti Tribe (Himachal Pradesh): The Hattis are a close-knit community who got their name from their tradition of selling homegrown vegetables, crops, meat and wool etc. at small markets called 'haat' in towns.

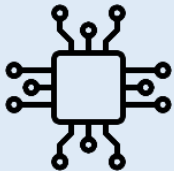
- The community has been making the demand since 1967, when tribal status was accorded to people living in the Jaunsar Bawar area of Uttarakhand, which shares a border with Sirmaur district.
- Their demand for tribal status gained strength because of resolutions passed at various maha Khumbliis over the years.

Binjhia (Chhattisgarh): The Binjhia in Chhattisgarh were listed as ST in Jharkhand and Odisha but not in Chhattisgarh.

- The Binjhia are non-vegetarians and agriculture is the mainstay of their economy. They do not eat beef and pork but consume alcoholic drinks including the handia (rice beer).

Process of inclusion in the ST list:

- The process to include tribes in the ST list begins with the recommendation from the respective State governments, which are then sent to the Tribal Affairs Ministry, which reviews and sends them to the Registrar General of India for approval.
- This is followed by the National Commission for Scheduled Tribes' approval before the list is sent to the Cabinet for a final decision.



SECURITY ISSUES



Cyber Attacks in India

Context: Recently, the premier medical institute in the country, the All India Institute of Medical Sciences New Delhi (AIIMS) was crippled by a major cyberattack.

About Cyberattacks:

- Cyberattacks are **unwelcome attempts to steal, expose, alter, disable or destroy information through unauthorized access to computer systems.**
- Typically, such forms of attacks to keep networks from functioning after encrypting data, are carried out by ransomware-seeking entities and organisations are sent demands which are often negotiated and paid without informing law enforcement.
- **Cyberterrorism:** It is often defined as any premeditated, politically motivated attack against information systems, programs and data that threatens violence or results in violence.



Reasons for increasing Cyber Attacks in India

- **Increasing dependency on technology:** As we grow faster, more and more systems are being shifted to virtual space to promote access and ease of use.
 - However, the downside to this trend is the increased vulnerability of such systems to cyber-attacks.
 - For e.g., there is a concern of widespread damage and huge loss if hackers are able to intrude into the nuclear, financial or energy systems of a country.
 - **Growing digital reliance in the post-COVID era** has exposed digital disparities which must be bridged through capacity building.
- **There's a sophisticated use of cyberspace by terrorists** to broaden their propaganda and incite hatred.
- **Lack of robust law enforcement mechanisms:** India's approach to cyber security has so far been ad hoc and unsystematic.
 - Despite a number of agencies, policies and initiatives, their implementation has been far from satisfactory.
- **Adverse relations with China:** China is considered one of the world leaders in information technology. Therefore, it is expected to have capabilities to disable or partially interrupt the information technology services in another country.

- Combined with the recent border standoff and violent incidents between the armies of the two countries, the adversity in relations is expected to spill over to attacking each other's critical information infrastructure.
- **Asymmetric and covert warfare:** Unlike conventional warfare with loss of lives and eyeball to eyeball situations, cyber warfare is covert warfare with the scope of plausible deniability, i.e., the governments can deny their involvement even when they are caught.
 - Similarly, even a small nation with advanced systems and skilled resources can launch an attack on a bigger power, without the fear of heavy losses.
 - Therefore, cyber warfare has increasingly become the chosen space for conflict between nations.
- **Lack of International Coordination:** International cooperation and consensus is missing in this field.
 - Low digital literacy among the general public and digital gaps amongst nations create an unsustainable environment in the cyber domain.
 - It is often reported that people are duped easily by click-baiting them into clicking interesting content, which often has malware attached to itself.

Major Government Initiatives for Cyber Security:

- **CERT-In:** It is an organisation of the Ministry of Electronics and Information Technology with the objective of securing Indian cyberspace.
- **Cyber Surakshit Bharat Initiative:** It is an initiative from the Ministry of Electronics and Information Technology (MeitY) that aims at creating a robust cybersecurity ecosystem in India. This program was in association with the National e-Governance Division (NeGD).
- **National Critical Information Infrastructure Protection Centre:** NCIIPC is a central government establishment, formed to protect critical information of our country, which has an enormous impact on national security, economic growth, or public healthcare.
- **Indian Cyber Crime Coordination Centre (I4C):** The MHA launched this I4C Indian Cyber Crime Coordination Centre program to combat cybercrime in the country, through a coordinated and efficient method.
- **Cyber Swachhta Kendra (Botnet Cleaning and Malware Analysis Centre):** It is an installation under the Ministry of Electronics and Information Technology (MeitY).
- **Information Technology Act, 2000:** IT Act of 2000 came into effect in India on 09 June 2000. IT Act states in its preamble that the purpose of the legislation is to provide legal recognition to electronic transactions.

Way Forward:

Human resource is crucial and there is an urgent need to create an **informal Indian team of Cyber Warriors**. The critical infrastructure managers should also be well trained in cyber warfare and well equipped with **all the technologies for isolating viruses and attacks**.

There should be a reward for white hackers who can highlight their shortcomings. The managers and Common mass must be made aware. There is also a need to enhance the general awareness levels of the government installations as well as the general public to counter such threats.

Separate wing under Army or Navy as Cyber Command on lines of US is required to establish along with a futuristic **National Cyber-Security Policy** which allocates adequate resources and addresses the concerns of the stakeholders. Similarly, there is a need for **quicker up-gradation of the existing infrastructure as information technology** is a fast-evolving field and there is a need to stay ahead of the competition.

National Cybersecurity Strategy

Context: The National Security Council Secretariat (NSCS) has formulated a draft National Cyber Security Strategy which looks at addressing the issue of security of national cyberspace.

About National Security Council:

- The National Security Council (NSC) of India is an executive government agency tasked with advising the Prime Minister's Office on matters of national security and strategic interest.
- It was established by the former Prime Minister of India Atal Bihari Vajpayee on 19 November 1998, with Brajesh Mishra as the first National Security Advisor.
- Prior to the formation of the NSC, these activities were overseen by the Principal Secretary to the preceding Prime Minister.

Members:

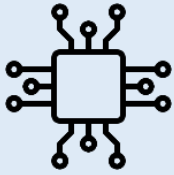
- Besides the **National Security Advisor (NSA), the Deputy National Security Advisors, the Ministers of Defence, External Affairs, Home, Finance of the Government of India, and the Vice Chairman of the NITI Aayog** are members of the National Security Council.

Organisational structure

- The NSC is the **apex body of the three-tiered structure** of the national security management system in India.
- The three tiers are the **Strategic Policy Group, the National Security Advisory Board and a secretariat from the Joint Intelligence Committee.**

About National Cyber Security Strategy:

- **Aim:** It proposes a separate legislative framework for cyberspace and the creation of an apex body to address threats, responses and complaints.
- **Need:** The existing legal and regulatory frameworks do not address the evolving threat scenarios or processes to combat the cyber incidents.
- There is no dedicated body to look after cyber security at present and no one that you can hold accountable.
- Currently, the response to cyber security threats can be taken under the information technology act and the Indian Penal Code.



SCIENCE & TECHNOLOGY



Deepfake technology & China

Context: The Cyberspace Administration of China is rolling out new regulations, to be effective from January 10, to restrict the use of deep synthesis technology and curb disinformation.

- Deep synthesis is defined as the use of technologies, including deep learning and augmented reality, to generate text, images, audio and video to create virtual scenes.
- One of the most notorious applications of the technology is deepfakes, where synthetic media is used to swap the face or voice of one person for another.
- **Deepfakes are getting harder to detect** with the advancement of technology. It is used to generate celebrity porn videos, produce fake news, and commit financial fraud among other wrongdoings

What is a deepfake?

- Deepfakes are a compilation of **artificial images and audio** put together with machine-learning algorithms to spread misinformation and replace a real person's appearance, voice, or both with similar artificial likenesses or voices.
- It can create people who do not exist and it can fake real people saying and doing things they did not say or do.
- The term deepfake originated in 2017, when an anonymous Reddit user called himself "Deepfakes." This user manipulated Google's open-source, deep-learning technology to create and post pornographic videos.
 - The videos were doctored with a technique known as face-swapping.
 - The user "Deepfakes" replaced real faces with celebrity faces.
- It has become one of the **modern frauds of cyberspace**, along with fake news, spam/phishing attacks, social engineering fraud, catfishing and academic fraud.
- Deepfake technology has been used to impersonate notable personalities like former U.S. Presidents Barack Obama and Donald Trump, India's Prime Minister Narendra Modi, Facebook chief Mark Zuckerberg and Hollywood celebrity Tom Cruise, among others.

Why Deep fakes are increasingly becoming a menace for the society?

- With the **improvement in technology**, deep fakes are also getting better. Initially, an individual with advanced knowledge of machine learning and access to the victim's publicly-available social media profile could only make deep fakes.
- However, the easy availability of apps/software has made it possible even for a person with basic computer knowledge to create such fakes. **Development of apps and websites** capable of such editing became more frequent and easily accessible to an average user.
- In other words, access to commodity cloud computing, algorithms, and abundant data has created a perfect storm to democratise media creation and manipulation.
- Deepfakes is now being used as a tool to spread computational propaganda and **disinformation at scale and with speed**.
- Disinformation and hoaxes have evolved from mere annoyance to high stake warfare for creating social discord, increasing polarization, and in some cases, influencing an election outcome.

What are the concerns regarding Deep Fakes?

Such technologies can give people a voice, purpose, and ability to make an impact at scale and with speed. But as with any new innovative technology, it can be weaponised to inflict harm.

- **Damage to Personal Reputation:** Deepfake can depict a person indulging in antisocial behaviours and saying vile things. These can have severe implications on their reputation, sabotaging their professional and personal life.
 - It can be used to create fake pornographic videos and to make politicians appear to say things they did not, so the potential for damage to individuals, organisations and societies is vast.
- **Targeting Women:** The malicious use of a deepfake can be seen in pornography, inflicting emotional, reputational, and in some cases, violence towards the individual
- **Issue of Fait Accompli:** Even if the victim could debunk the deep fake, it may come too late to remedy the initial harm.
- **Blackmailing Tool:** Further, Deepfakes can be deployed to extract money, confidential information, or exact favours from individuals.
- **Destabilise Society:** Deepfakes can become a very effective tool to sow the seeds of polarisation, amplifying division in society, and suppressing dissent.
- **Public Warfare:** A deepfake could act as a powerful tool by a nation-state to undermine public safety and create uncertainty and chaos in the target country. Nation-state actors with geopolitical aspirations, ideological believers, violent extremists, and economically motivated enterprises can manipulate media narratives using deepfakes.
- **Anti-state sentiment:** Nation-state actors with geopolitical aspirations, ideological believers, violent extremists, and economically motivated enterprises can manipulate media narratives using deepfakes. It can be used by insurgent groups and terrorist organisations, to represent their adversaries as making inflammatory speeches or engaging in provocative actions to stir up anti-state sentiments among people.
- **Undermining democracy:** A deep fake can also aid in altering the democratic discourse and undermine trust in institutions and impair diplomacy. False information about institutions, public policy, and politicians powered by a deepfake can be exploited to spin the story and manipulate belief.
 - A deep fake of a political candidate can sabotage their image and reputation.
 - Leaders can also use them to increase populism and consolidate power.
- **Liar's Dividend:** It is a situation where an undesirable truth is dismissed as deep fake or fake news. It can also help public figures hide their immoral acts in the veil of deepfakes and fake news, calling their actual harmful actions false.
- **Creation of Echo Chambers in Social Media:** Falsity is profitable, and goes viral more than the truth on social platforms. Combined with distrust, the existing biases and political disagreement can help create echo chambers and filter bubbles, creating discord in society.
- **Disrupt the right to privacy:** Given the increasing affordability of smartphone & internet, substantive population of any given country have their digital presence in one or more social media platforms. The content shared over these platforms can be misused for creating Deepfakes which is clearing a violation of right to Privacy.

Quantum Computing

Context: The allure of quantum computers (QC) is their ability to take advantage of quantum physics to solve problems too complex for computers that use classical physics.

- The 2022 Nobel Prize for physics was awarded for work that rigorously tested one such ‘experience’ and paved the way for its applications in computing – which speaks to the contemporary importance of QCs
- In 2021 alone, the Indian government launched a National Mission to study quantum technologies with an allocation of ₹8,000 crore; the army opened a quantum research facility in Madhya Pradesh; and the Department of Science and Technology co-launched another facility in Pune.
- Given the wide range of applications, understanding what QCs really is crucial to sidestep the misinformation surrounding it and develop expectations that are closer to reality.

How does a computer use physics?

- A macroscopic object – like a ball, a chair or a person – can be at **only one location at a time**; this location **can be predicted accurately**; and the object’s effects on its surroundings can’t be transmitted faster than at the speed of light. This is the classical ‘experience’ of reality.
- For example, you can observe a ball flying through the air and plot its trajectory according to Newton’s laws. You can predict exactly where the ball will be at a given time. If the ball strikes the ground, you will see it doing so in the time it takes light to travel through the atmosphere to you.
- Quantum physics describes **reality at the subatomic scale**, where the objects are particles like electrons. In this realm, **you can’t pinpoint the location of an electron**.
- You can only know that it will be present in a given volume of space, with a probability attached to each point in the volume – like 10% at point A and 5% at point B. When you probe this volume in a stronger way, you might find the electron at point B. If you repeatedly probe this volume, you will find the electron at point B 5% of the time.
- There are many interpretations of the laws of quantum physics. One is the ‘**Copenhagen interpretation**’, which Erwin Schrödinger popularised using a thought-experiment he devised in 1935.
 - There is a cat in a closed box with a bowl of poison. There is no way to know whether the cat is alive or dead without opening the box. In this time, the cat is said to exist in a **superposition of two states: alive and dead**.
 - When you open the box, you force the superposition to collapse to a single state. The state to which it collapses depends on the probability of each state.
 - Similarly, when you probe the volume, you **force the superposition of the electrons’ states to collapse to one** depending on the probability of each state.
- The other ‘experience’ relevant to quantum-computing is **entanglement**. When two particles are entangled and then separated by an arbitrary distance (even more than 1,000 km), making an observation on one particle, and thus causing its superposition to collapse, will instantaneously cause the superposition of the other particle to collapse as well.
 - This phenomenon seems to violate the notion that the speed of light is the universe’s ultimate speed limit.
 - That is, the second particle’s superposition will collapse to a single state in **less than three hundredths of a second**, which is the time light takes to travel 1,000 km.

How would a computer use superposition?

- The bit is the fundamental unit of a classical computer. Its value is 1 if a corresponding transistor is on and 0 if the transistor is off.

- The transistor can be in one of two states at a time – on or off – so a bit can have one of two values at a time, 0 or 1.
- The **qubit** is the fundamental unit of a Quantum Computing. It's typically a particle like an electron.
 - Google and IBM have been known to use transmons, where pairs of bound electrons oscillate between two superconductors to designate the two states.
- Some information is directly encoded on the qubit: if the spin of an electron is pointing up, it means 1; when the spin is pointing down, it means 0.
- But instead of being either 1 or 0, the **information is encoded in a superposition**: say, 45% 0 plus 55% 1. This is entirely unlike the two separate states of 0 and 1 and is a third kind of state.
- The **qubits are entangled** to ensure they work together. If one qubit is probed to reveal its state, so will some of or all the other qubits, depending on the calculation being performed. The computer's final output is the state to which all the qubits have collapsed.
- One qubit can encode two states. Five qubits can encode 32 states. A computer with N qubits can encode 2^N states – whereas a computer with N transistors can only encode $2 \times N$ states.
- So a qubit-based computer can access more states than a transistor-based computer, and thus access **more computational pathways** and solutions to more complex problems.

What is India's National Mission on Quantum Technologies & Applications (NM-QTA)?

- The mission will oversee the development of quantum technologies for communications, computing, materials development and cryptography.
- The mission addresses the constraints (listed above) that led to slow progression of country in quantum field, through adoption of holistic approach.
- Announced in Budget 2020
- Period: Five years (2020-25)
- Total Funds: Rs 8000 years
- Implementing Body: Department of Science & Technology (DST)

Significance of the mission:

- The mission may eventually lead to the creation of a **super-secure communication network**
- It will help prepare next generation **skilled manpower**, boost translational research and also encourage entrepreneurship and start-up ecosystem development.
- It will find utility in finding **solution for complex problems** in fields of computing, communications, sensing, chemistry, cryptography, imaging and mechanic
- The mission will enable **India to emerge as Global leader** in the field through increased investment & focus in Quantum Technologies

Rare Diseases

In News: Rajya Sabha MP from the Nationalist Congress Party Fauzia Khan on Friday raised concerns over the benefits of the National Policy of Rare Diseases (NPRD) not reaching any patient with rare diseases even after several months since its introduction.

Context:

- The Union Ministry of Health and Family Welfare notified the **NPRD in March 2021**.
- An estimated 5000 to 8000 rare diseases have been identified worldwide, affecting approximately 6 to 8% of the population.
- Individual rare diseases affect few people, but cumulatively have a major impact on public health.

What are Rare diseases:

- A rare disease is any disease that affects a small percentage of the population such as fewer than 200,000 people across a broad range of possible disorders.
- These rare diseases are majorly thought to be genetic and are passed on from one generation to the next.
- In India, Haemophilia, Thalassemia, Sickle cell anaemia and Primary Immuno Deficiency in children, auto-immune diseases, Lysosomal storage disorders such as Pompe disease and Gaucher’s disease are in the rare diseases list.

National Policy of Rare Diseases (NPRD) 2021

- Objectives – promotion of research and development for diagnosis and treatment of rare diseases.
- Promotion of local development and manufacture of drugs and creation of conducive environment for indigenous manufacturing of drugs for rare diseases at affordable prices.
- The rare diseases have been identified and categorized into 3 groups.
- Group 1: Disorders amenable to one-time curative treatment.
- Group-2: Diseases requiring long term/lifelong treatment having relatively lower cost of treatment and benefit has been documented in literature and annual or more frequent surveillance is required.
- Group 3:- Diseases for which definitive treatment is available but challenges are to make optimal patient selection for benefit, very high cost and lifelong therapy.
- Eight (08) Centres of Excellence (CoEs) have been identified for diagnosis, prevention and treatment of rare diseases.
- Five Nidan Kendras have been set up for genetic testing and counselling services.



Challenges in India:

- **Lack of treatment:** About 95% rare diseases have no approved treatment and less than 1 in 10 patients receive disease specific treatment.
- **Loss of lives** due to delayed and misdiagnoses, limited access to resources, and absence of specific therapies often preclude patients from receiving proper, timely care.
- **Impact on children:** Children are disproportionately affected by these diseases as compared to adults
- 50 percent of new cases are observed to be in children, out of which 35 percent of children die before the age of one year, 10 percent die between the ages of 1 to 5 years, and 12 percent between the ages of 5 to 15 years. (Ministry of Health and Family Welfare 2017)
- **High cost:** The cost of treatment of rare diseases may vary from INR 10 lakhs to INR 1 crore on an annual basis.
- **Issues in policy design:** India does not have its standard definition for rare disease and neither does sufficient data on prevalence exists.
- The Government of India launched the Indian Rare Disease Registry only in April 2017.
- Only 450 rare diseases have been recorded in the registry as per data available from tertiary hospitals
- **Unending delay and lack of urgency in policy implementation**
- Eg: lack of will of Centres of Excellence (CoE), designated as per the NPRD policy, has endangered the survival prospects of 415 patients, largely children, diagnosed with rare diseases.
- Majority of these patients have been diagnosed with Gaucher disease, for which therapy approved by Drug Controller General of India is available for many years.

- **Lack of governance**
- In NPRD policy, many CoEs were yet to seek financial support as per the policy for treating the patients.

Way forward

- The private initiatives are leading the war, but without support from the Government, such solutions are not sustainable.
- Strength of policy making is integral to the strength of the government as a whole, and that of the country at large.

End-to-end encryption

In News: Apple announced it will be increasing the number of data points protected by end-to-end encryption on iCloud from 14 to 23 categories.

Context:

- With end-to-end encryption, user data will be protected even in case data is breached in the cloud. Similarly, Elon Musk wanted Twitter DMs to be encrypted.
- However, the government agencies are not happy with above developments.
- Such as , the FBI is deeply concerned with the threat of end-to-end encryption and user-only access pose as they hinder its ability to protect citizens from cyber-attacks, violence against children, and terrorism.

What is end-to-end encryption:

- End-to-end encryption is a **communication process** that encrypts data being shared between two devices.
- It **prevents third parties** like cloud service providers, internet service providers (ISPs) and cybercriminals from accessing data while it is being transferred.
- The process of end-to-end encryption uses an **algorithm** that transforms standard text into an unreadable format.
- This format can only be unscrambled and read by those with the **decryption keys**, which are only stored on endpoints and not with any third parties including companies providing the service.
- Apple shared that end-to-end encrypted data can only be **decrypted by trusted devices** where users are signed with their Apple ID. No one else can access this data and it **remains secure even in the case of a data breach** in the cloud storage.



Applications:

- End-to-end encryption is used to **secure communications**.
- Some of the popular instant-messaging apps that use it are Signal, WhatsApp, iMessage, and Google messages.
- It is also used to **secure passwords**, protect stored data and safeguard data on cloud storage.
- It has long been used when transferring business documents, **financial details**, legal proceedings, and personal conversations.
- It can also be used to **control users' authorisation** when accessing stored data, which seems to be what Apple intends to do.

DNA technology Regulation Bill

Context:

- In April 2022, The Ministry of Science and Technology (MST) announced the draft **DNA Technology (Use and Application) Regulation Bill**.
- With the recent introduction of the new Digital Personal Data Privacy Bill removing differences between sensitive personal data and personal data and adding to it the nuance of only governing digital data, **privacy has become a popular concern**.
- While stakeholders have enquired about the expansion of DNA use across the **justice system**, the MST has yet to confirm such plans.

DNA Technology Regulation Bill:

- The Bill creates an **umbrella databank** for multiple purposes
- It aims to set up **DNA data banks** across the country and **DNA laboratories** for testing and storing **DNA profiles** and use these for case resolution in **crimes (primarily sexual assault)**.
- It includes training over 20,000 investigation officers, prosecution officers, and medical professionals to collect forensic evidence in cases of sexual assault using standardised sexual assault evidence collection kits.
- Preceding the draft, there was no specific legislation in India to outline the guidelines on DNA collection, storage and use in law enforcement. However, DNA evidence was covered under Section 45 of the Indian Evidence Act 1872 under 'scientific evidence.'
- The Bill has **not introduced DNA evidence into the Indian legal system**.
- However, **DNA profiling is used** in law enforcement have been seen in India since **Kunhiraman vs Manoj, 1991, on proof of paternity**.
- It aims to address the existing gap in regulating the use of **biological sample evidence**
- It also covers offences under special laws such as The Immoral Traffic (Prevention) Act, 1956; The Medical Termination of Pregnancy Act, 1971; The Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989, amongst others.

Challenges of the bill:

- **Data bias:** The Bill lists civil matters where lawful procedures can use DNA profiling.
- The application areas cover **controversial disputes** relating to pedigree, issues pertaining to **reproductive technologies, immigration or emigration**, and issues relating to **establishing national identity**.
- **Enhancing discrimination** against the groups it claims to protect. For example, The Immoral Traffic (Prevention) Act discriminates against transsexual people who cannot access formal employment and are thus consigned to sex work and solicitation.
- **Lack of privacy and dignity of individuals:** The photographic forensic data is used in combination with other digitised data and lack of collection guidelines within this regulation is a concern.
- DNA can reveal sensitive information used to criminalise a community and disclose information on ancestry, feeding into social discrimination.
- **Insecurity over DNA laboratories** hosting data – biases in artificial intelligence, algorithms it monitors, and the policies that use these,
- **Data storage:** It is unclear how the Bill intends to regulate data storage in such DNA laboratories.
- **Lacunae in design:** Incongruity in the Bill's understanding of DNA evidence as biological samples to further include photographic forensic samples.

- The integration of photographic or video material in this legislation has created an unnecessary caveat in how this evidence can be collected, stored, and used, especially since such samples may go against privacy requirement.
- **Biases in law enforcement:**
- Much like **automated policing**, where crime is registered in higher numbers because of the **increased surveillance** and dispatch of police officers, the results of DNA database categorisation are often **inaccurate** due to **unequal testing of certain disadvantaged communities** over others.
- Facial Recognition Technology (FRT) used in law enforcement also displays these biases, aside from previously mentioned privacy concerns, churning up inaccurate outcomes (in one case, 138 out of 140 faces were misidentified by an FRT)
- **Accuracy of DNA evidence** – Lack of standardised analysis in hair, fibre and different crime scene samples can lead to wrongful convictions.
- For example, fingerprint analysts often alter their conclusions on prints and identification with additional and incremental information on prints.
- **Issues of injustice:** A single DNA profile might be mistakenly generated when samples from multiple people are combined or collected from a crime scene.
- Partial profiles can match many more people than complete profiles.
- Full profiles may also match a person other than the guilty individual.
- These outcomes are further complicated by different rates of DNA shedding, contamination issues, investigator biases etc., all of which still need to be fully addressed by the legislation in question.
- **Others** – DNA profiles will likely include virtually everyone since DNA is left at the crime scene before and after the crime by several persons who may not have been involved in the crime.

Way forward:

- Thus, if combined with existing data biases in law enforcement, the DNA profiling bill can contribute to data that can be misused for caste-based or community profiling in the country, especially in cases where minority groups are disproportionately criminalised.
- The eventual extension of DNA profiling in other cases beyond sexual assault can be included as part of changes.



ETHICS

**Corruption in India**

Context: Recently the International Anti-Corruption Day-2022 was organised by the CBI on 'Anti-Corruption efforts – A sine qua non for Development and Security.

About the Corruption:

- Corruption refers to misusing public power for personal gain. It can be done by an elected politician, civil servant, journalist, administrator of a school, or anyone in authority.
- Apart from public corruption, we also have private corruption between individuals and businesses.

Global surveys and indices:

- India has the highest rate of bribery and use of personal links to access public services such as healthcare and education in Asia, according to a survey released by global civil society Transparency International.
- India is in the 85th position among 180 countries in the Corruption Perception Index, 2021.

Causes of corruption:

- **Legacy issues:** Rampant poverty and empty coffers of the government at the dawn of independence leading to chronic low salaries of the government officials
 - Pre liberalization license permit raj catered by Monopolies and restrictive trade practices facilitated the corruption.
 - The lack of economic freedom led to abuse of the system.
 - Necessities of development overshadowed vigilance procedures.
- **Political system:** Use of black money in elections to win at any cost creates the need for the recovery of that cost through malpractices.
 - Election funding is not transparent making it prone to the usage of black money and funding based on quid pro quo.
 - It leads to crony capitalism, an unholy nexus between politicians and corporates.
 - Criminalization of politics- when the rule-breakers become rule makers, the casualty is the rule of law.
- **Economic structure:** Low levels of formalization (merely 10%) of the economy breed black money.
 - Stringent compliance rules for entry and exit for businesses result in bribery.
 - Unequal distribution of wealth – Transparency International data suggests that corruption is directly proportionate to the economic gap in a nation.
- **Legal lacunae:** Archaic laws like IPC 1860 don't capture the complexities of administration and lead to the escape of wrongdoers.
 - Lacunae in the Lokpal act and delays in the appointments both at the state and central levels
 - Dilution of the RTI act and political misuse of CBI and other agencies.
- **Administrative lacunae:** Loopholes give discretionary powers to the officials making working prone to corruption.
 - Lack of resources, funding, infrastructure and manpower in the vigilance institutions.
 - Lack of incorporation of standard practices by organizations like Banks, sports organizations which results in multi-billion-rupee scams.

- g. Punjab National Bank scam, commonwealth scam.
- **Judicial delays:** Lack of protection to good Samaritans
 - Targeting of upright and non-corrupt officials and rewards to corrupt officials
 - Near non-existent whistleblowers protection
- **Social problems:** The mindset of the citizenry that doesn't look at the problems seriously and even accepts it as a necessary part of the system.
 - Increasing consumerism in the new middle class that is ready to bribe to get things done.
 - Failure of social morality, education system to inculcate the values

Impacts of corruption:

- **Hindrances to developmental process:** Loss of wealth due to corruption and siphoning away of taxpayers' money leave little to spend in the social sector.
- Corruption in the social sectors like PDS, health and education schemes lead to demographic disadvantage.
- **Economic loss:** Undermines ease of doing business.
 - Corruption in the public services sector carries high risks for conducting good businesses.
 - Companies are likely to unwanted red tapes, petty corruption, bribes for finalizing any procedures or deals.
 - Wrong allocation policies result in undervaluation of resources like Coal blocks, Hydrocarbon projects, Spectrum allocation. Eg. 2G scam, Coalgate.
 - This mismanagement of resources leads to environmental degradation and exploitation.
 - Corruption of financial sector officials like Banks, the stock market erodes the strength of the economy. E.g. PNB scam, PMC scam, Harshad Mehta scandal
- **Social sector losses:** Corruption in government projects targeting poor and vulnerable section of the society increases the economic gap between the rich and the poor
- The corrupt system denies the poor a chance to improve their status rendering them eternally poor

Legal Framework for Fighting Corruption:

- **Prevention of Corruption Act, 1988** provides for penalties in relation to corruption by public servants and also for those who are involved in the abetment of an act of corruption.
 - Amendment of 2018 criminalised both bribe-taking by public servants as well as bribe giving by any person.
- **The Prevention of Money Laundering Act, 2002** aims to prevent instances of money laundering and prohibits use of the 'proceeds of crime' in India.
- **The Companies Act, 2013** provides for corporate governance and prevention of corruption and fraud in the corporate sector.
 - The term 'fraud' has been given a broad definition and is a criminal offence under the Companies Act.
- **The Indian Penal Code, 1860** sets out provisions which can be interpreted to cover bribery and fraud matters, including offences relating to criminal breach of trust and cheating.
- **The Foreign Contribution (Regulation) Act, 2010** regulates the acceptance and use of foreign contributions and hospitality by individuals and corporations.

Regulatory Framework:

- **The Lokpal and Lokayuktas Act, 2013** provides for an establishment of an ombudsman for the central and state governments (**Lokpal and Lokayuktas, respectively**).

- These bodies are required to act independently from the government and have been empowered to investigate allegations of corruption against public servants, which include the prime minister and other ministers.
- **The Central Vigilance Commission** is mandate is to oversee the vigilance administration and to advise and assist the executive in matters relating to corruption.

Suggestive Measures:

- **Education:** Education is one of the most critical steps. It can help in reinforcing the correct business practices.
 - Mandatory education courses like anti-money laundering must be introduced.
- **Accountability:** Accountability mechanisms can also help in curbing corruption.
- **Efficient Reporting:** Furthermore, it can be easier to reduce corruption if reporting it becomes simple.
- **Leading by the best practices:** The senior employees in the management department must lead by example and cultivate an open and transparent culture.
- **Encouraging ethical culture:** Similarly, rewards and incentives must be granted to encourage people to cultivate an ethical culture.
- **Need for innovative anti-corruption solutions:** There is the need for real-time information sharing between law enforcement agencies.

There is a need for windfall reforms in each and every section of the system to fight the menace. Every aspect of governance must be improved for efficiency, economy, and effectiveness.

About International Anti-Corruption Day (IACD):

- It has been observed annually, on 9 December, since the passage of the United Nations Convention Against Corruption on 31 October 2003

Significance of 2022 IACD:

- The 2022 IACD also marks the beginning of the twentieth anniversary of the UN Convention Against Corruption – UNCAC.
- This is reflected by the theme of this year's international day, 'UNCAC at 20: Uniting the World Against Corruption.'
- It seeks to highlight the crucial link between anti-corruption and peace, security, and development



PRACTICE QUESTIONS



Q.1) With reference to the Indian climate, consider the following statements:

1. In recent years, excessive rainfall in southern peninsular is due to El Nino.
2. Ocean warming is strong in the Arabian Sea because it receives excess heat through atmospheric tunnels and bridges.

Which of the statements given below is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.2) With reference to 'INS Vikrant', consider the following statements:

1. It is India's first 100% indigenous aircraft carrier.
2. It was built by Mazagaon Shipyard limited.
3. It is nuclear powered generating around 80MW of energy.

Which of the following statements are correct:

- a. 1 only
- b. 1 and 2 only
- c. 1, 2 and 3
- d. None of the above

Q.3) Consider the following statements regarding Indian Knowledge System (IKS):

1. Indian Knowledge System (IKS) is an innovative cell under Ministry of Tribal Welfare
2. It will actively engage in spreading the rich heritage of our country and traditional knowledge in the field of Arts and literature, Agriculture, Basic Sciences, Engineering & Technology, etc.

Which of the above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.4) Consider the following statements:

1. The Wildlife Trust of India was formed in 2008.
2. India's First Eco Bridge was built in Tadoba-Andhari Tiger Reserve.

Which of the statements given below is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.5) Consider the following statements:

1. Under The Foreign Exchange Management (FEMA) act, offences related to foreign exchange are criminal offenses.
2. The offenses under the Prevention of Money Laundering Act(PMLA) are civil offenses.
3. The Enforcement Directorate was formed under the FEMA Act.

Which of the following statements are correct:

- a. 1 only
- b. 2 only
- c. 2 and 3 only
- d. None of the above

Q.6) With reference to Indian economy, consider the following:

1. Commercial Banks
2. Merchant Bankers
3. Stock Brokers
4. Non-Banking Financial Companies

Which of the above are regulated by Reserve Bank of India?

- 1 and 3 only
- 2 and 4 only
- 1 and 4 only
- All of the above

Q.7) Consider the following:

- Sulphur Dioxide
- Nitrogen Dioxide
- Mercury
- Particulate matter

Which of the above pollutants can be released by the coal based power plants?

- 1 2 and 3 only
- 2 3 and 4 only
- 1 3 and 4 only
- All of the above

Q.8) Consider the following statements regarding National Statistical Commission (NSC):

- It is an autonomous organization works under Ministry of Statistics and Programme Implementation.
- It was established on the recommendations of the Raghu Ram Rajan Commission.
- The Commission has a part-time Chairperson, four part-time Members and an ex-officio Member.

Which of the above are correct?

- 1 and 2 only
- 1 and 3 only
- 2 and 3 only
- 1 2 and 3

Q.9) Consider the following statements regarding Geological Survey of India:

- It was set up in 1851 primarily to find coal deposits for the Railways.

- It works under the Ministry of Earth Sciences
- It is headquartered in Delhi

Which of the statements given above is/are correct?

- 1 only
- 2 and 3 only
- 2 only
- 1 and 3 only

Q.10) With reference to “National Financial Reporting Authority”, consider the following statements:

- It was formed in 2008 under the National Financial Reporting Authority Act.
- It is the sole audit regulator for listed and unlisted companies in India.
- It comes under Ministry of Commerce and Industry.

Which of the statements given below is/are correct?

- 1 and 2 only
- 2 only
- 1 and 3 only
- 3 only

Q.11) Recently in news, the “Wassenaar arrangement” is related to which of the following:

- To prohibit development, production, and transfer of biological weapons.
- To prevent the spread of nuclear weapons and its technologies.
- To establish accountability and compensation for loss and destruction.
- To facilitate exchange of information on transfer of conventional weapons.

Q.12) Consider the following statements regarding Indian Council for Cultural Relations (ICCR):

- It was founded in 1950 by Maulana Abul Kalam Azad.
- It is headquartered in Hyderabad.

3. In addition to organising cultural festivals in India and overseas, the ICCR financially supports a number of cultural institutions across India, and sponsors individual performers.

Which of the statements given above is/are correct?

- 1 and 2 only
- 2 and 3 only
- 1 and 3 only
- 1 2 and 3

Q.13) He wrote States and Minorities: What are Their Rights and how to Secure Them in the Constitution of Free India and The problem of rupee: its origin or solution. He was

- Bipin Chandra Pal
- Lala Lajpat Rai
- B R Ambedkar
- Motilal Nehru

Q.14) With reference to “Mission Prarambh”, consider the following statements:

- It is the first private rocket launch by Indian Space Research Organisation (ISRO)
- It is an orbital rocket with a payload capacity of up to 300 kilograms.

Which of the following statements are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Q.15) Consider the following statements regarding Directorate of Revenue Intelligence (DRI):

- DRI is the apex anti-smuggling agency of India, working under the Central Board of Indirect Taxes & Customs, Ministry of Finance, Government of India.
- It is headquartered in Mumbai.

Which of the above statements is/are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Q.16) Which of the following statements regarding black soils of India are correct?

- They are rich in potash and lime
- They are poor in nitrogen and phosphorous
- They are well-developed in Rajasthan and UP.
- Their characteristic feature is to develop cracks upon drying.

Select the correct answer using the codes given below.

- 1, 2 and 4
- 2, 3 and 4
- 1 and 4
- 2 and 3 only

Q.17) With reference to “Digi Yatra”, consider the following statements:

- It replaces the boarding pass completely.
- It has been launched by the Airport Authority of India

Which of the following statements are correct?

- 1 only
- 2 only
- Both 1 and 2
- Neither 1 nor 2

Q.18) Consider the following statements regarding National Crisis Management Committee (NCMC):

- It is a committee set up by the Government of India in the wake of a natural calamity for effective coordination and implementation of relief measures and operations.
- It is headed by the Prime Minister of India.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.19) With reference to ChatGPT, consider the following statements :

1. ChatGPT is a kind of computer language model based on deep learning techniques
2. ChatGPT, among other things, can be used to write fiction.
3. ChatGPT has been developed by Elon Musk's Tesla

Which of the statements given above are correct?

- a. 1 only
- b. 1 and 3 only
- c. 1 and 2
- d. 2 and 3

Q.20) Consider the following statements:

1. Exit polls are conducted after the votes have been cast, while opinion polls are conducted before.
2. Exit polls asks voters which political party they voted for.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.21) Consider the following states:

1. Karnataka
2. Assam
3. Tamil Nadu
4. Kerala

How many of the above are generally known as coffee-producing States?

- a. Only one State
- b. Only two States
- c. Only three States
- d. All four States

Q.22) Consider the following statements regarding Rajya Sabha:

1. Vice-President of India is ex-officio Chairman of the Council of States i.e., Rajya Sabha.
2. The Fourth Schedule to the Constitution provides for allocation of Rajya Sabha seats to the states and Union Territories, on the basis of the population of each state.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.23) Koundinya Wildlife Sanctuary is often mentioned in news in

- a. Telangana
- b. Karnataka
- c. Odisha
- d. Andhra Pradesh

Q.24) Consider the following statements regarding Krishi Udaan Scheme:

1. The scheme was launched in 2014 to assist farmers in transporting agricultural products so that it improves their value realisation.
2. It is a convergence scheme where three Ministries/Departments namely Ministry of Civil Aviation, Department of Agriculture & Farmers' Welfare would leverage their existing schemes to strengthen the logistics for transportation of Agri-produce.
2. E-KUSHAL (Krishi UDAN for Sustainable Holistic Agri-Logistics) platform to be developed facilitate in information dissemination to all the stakeholders.

Which of the statements given above is/are correct?

- a. 1 and 2 only
- b. 2 only
- c. 3 only
- d. 1 and 3 only

Q.25) With reference to Indian judiciary, consider the following statements:

1. The Chief Justice of a High Court for any State may at any time, with the previous consent of the President can appoint ad hoc judges in high court
2. Article 236 of the Indian Constitution deals with the appointment of ad hoc judges to the high courts

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.26) The term Multi-tranche financing facility is often mentioned in news is an Initiative of

- a. World Bank
- b. International Monetary Fund
- c. Asian Infrastructure Investment Bank
- d. Asian Development Bank

Q.27) Consider the following:

1. e-Green Watch portal serves as a single point source for the information related to forest fires in India.
2. Van Agni Geo-portal is an advanced technology based platform designed to facilitate automation, streamlining and effective management of works taken up under CAMPA fund.
3. PARIVESH portal is a single-window integrated environmental management system for online submission and monitoring of the proposals submitted by the proponents for seeking Environment, Forest,

Wildlife and Coastal Regulation Zone clearances from Central Government.

Which of the statements given above is/are correct?

- a. 1 and 2 only
- b. 2 only
- c. 3 only
- d. 1 and 3 only

Q.28) The term “KAZA” often heard in the news roughly corresponds to which of the following regions ?

- a. Region along the border of Gaza strip near the Mediterranean shores
- b. Region along southern Africa stretching from Angola to Zimbabwe
- c. Region along Persian Gulf and Horn of Africa
- d. The entire coastal areas of the Mediterranean Sea.

Q.29) With reference to “Patwa” sometimes mentioned in the news, consider the following statements:

1. It is a medicinal shrub.
2. It grows in the Western Ghats.
3. It is a strong anti-oxidant that can be used in pharmaceutical industries.

Which of the statements given above is/are

- a. 1 only
- b. 3 only
- c. 1 and 3
- d. 2 and 3

Q.30) With reference to ‘Global Environment Facility’, which of the following statements is/are correct?

1. The Global Environment Facility (GEF) is a multilateral environmental fund that provides grants and blended finance in developing countries for projects related to biodiversity.

2. It was established ahead of the 1972 Rio Earth Summit.
3. It also supports implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer.

Select the correct answer by using the code given below:

- a. 1 and 3 only
- b. 2 and 3 only
- c. 1 and 2 only
- d. 1 2 and 3

Q.31) Consider the following pairs:

Pass	Area
1. Mana Pass	Old silk route
2. Nathu La Pass Reserve	Nanda Devi Biosphere
3. Sela Pass	Tawang

Which of the statements given above is/are correctly matched?

- a. 1 and 2
- b. 2 only
- c. 1 and 3
- d. 3 only

Q.32) With reference to “NavIC”, consider the following statements:

1. Presently, it has 7 satellites.
2. Its new satellites will use S and L2 band of frequency.
3. Among other things, it helps in weather forecasting for fishermen folk.

Which of the following statements are correct:

- a. 1 only
- b. 1 and 2 only
- c. 3 only
- d. 2 only

Q.33) Which of the below given pairs is/are correctly matched?

Lunar Mission	Country
1. Artemis 1	NASA
2. Beresheet	Japan
3. Hope	UAE

Choose the correct code:

- a. 1 and 3
- b. 2 and 3
- c. 1, 2 and 3
- d. 1 only

Q.34) With respect to T lymphocytes (T cells), consider the following statements:

1. T-Cell blood cancer incidence increases with age.
2. They are found in the stem cells of bone marrow.

Which of the statements are correct:

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.35) Recently seen in news, “The 3200 Phaethon” is

- a. A meteor shower
- b. An asteroid
- c. A natural satellite
- d. A new galaxy

Q.36) Which of the following organization is/are constituted under Wildlife (Protection) Act (WPA), 1972

1. Wildlife Crime Control Bureau
2. Central Zoo Authority
3. National Board for Wildlife

Choose the correct code:

- a. 1, 2 and 3
- b. 3 only
- c. 1 and 3
- d. 2 and 3

Q.37) With respect to Autonomous District Councils (ADCs), consider the following statements:

1. ADC are formed under article 244 in the Fifth Schedule of the constitution.
2. ADC are applicable to only four states.
3. ADC can make laws on social customs.

Which of the statements are correct:

- a. 2 only
- b. 2 and 3 only
- c. 1 only
- d. 1 and 2 only

Q.38) Which of the following are factors of production:

1. Real estate
2. Gig workers
3. Entrepreneurship
4. Angel investors
5. Management Information System
6. Trade Unions

Select the correct answer using the code given below:

- a. 1, 2,3 and 4
- b. 1, 2, 3 and 6
- c. 1, 2, 3 and 5
- d. 1, 2, 3, 4, 5 and 6

Q.39) Consider the following statements about Pharmaceutical Technology Upgradation Assistance (PTUAS) Scheme

1. It aims to facilitate MSMEs of proven track record to meet national and international regulatory standards.

2. It includes interest subvention or capital subsidy on their capital loans.

Choose the correct statements:

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.40) Rashtriya Gram Swaraj Abhiyan is set up under the

- a. Respective State Governments
- b. Ministry of Rural Development
- c. NITI Aayog
- d. Ministry of Panchayati Raj

Q.41) With reference to the Parliament of India, which of the following Parliamentary Committees scrutinizes moneys shown in the accounts as having been disbursed were legally available for, and applicable to, the service or purpose to which have been applied or charged and that the expenditure conforms to the authority which governs it?

- a. Estimates committee
- b. Committee on Public Undertakings
- c. Committee on Government Assurances
- d. Committee on Public Accounts

Q.42) Consider the following statements regarding central consumer protection authority (CCPA):

1. CCPA is a regulatory body established in 2020 based on the provisions of the Consumer Protection Act, 2019.
2. CCPA works under the administrative control of the Department of Administrative Reforms and Public Grievances.

Which of the above statements is/are correct?

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.43) With reference to solar system, consider the following statements:

1. Saturn's atmosphere is composed mostly of molecular hydrogen and helium.
2. Jupiter is the biggest planet in our solar system.
3. Saturn has 79 confirmed moons.
4. Titan is the Jupiter's largest satellite.

Which of the statements given above are correct?

- a. 1 and 2 only
- b. 1 and 4 only
- c. 2 and 3 only
- d. 2 and 4 only

Q.44) With reference to mammals, consider the following statements:

1. Monotremes or Prototherians are egg laying (oviparous) mammals.
2. Kangaroos, wallabies, koala, possums, opossums, wombats are examples of Marsupials.
3. Whales and dolphins are examples of cetaceans are aquatic mammals without posterior limbs.

Which of the statements given above is/are correct?

- a. 1 and 2 only
- b. 2 only
- c. 1 and 3 only
- d. 1 2 and 3

Q.45) With reference to leather industry in India, consider the following statements:

1. India is the largest producer of footwear and leather garments in the world.
2. It is the second largest exporter of leather garments in the world.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 only

- c. Both 1 and 2
- d. Neither 1 nor 2

Q.46) With reference to 'INS Murmagao', consider the following statement

1. It is developed by Cochin Dock Shipbuilders Limited.
2. It is fully indigenous and has state-of-art stealth capabilities
3. It is equipped with surface-to-surface missiles weapon system only.

Choose the correct statement

- a. 1 and 2 only
- b. 1 and 3 only
- c. 1 only
- d. None

Q.47) With reference to the use of synNotch therapy in health sector, which of the following statement(s) is/are correct?

1. It can target cancer cells more effectively without harming healthy cells.
2. It produces cytokines outside the tumor cells.

Select the correct answer using the codes given below.

- a. 1 only
- b. 2 only
- c. Both 1 and 2
- d. Neither 1 nor 2

Q.48) Consider the following freedom fighters:

1. Ram Prasad Bismil
2. Ashfaqulla Khan
3. Chandrashekhar Azad
4. Sachindra Bakshi

Who of the above was/were actively associated with the Kakori Conspiracy?

- a. 1 and 3 only

- b. 2 and 4 only
- c. 1 2 and 4 only
- d. All of the above

Q.49) There is some concern regarding the deepfake and deep synthesis technology. Why?

1. They can be used in criminal activities like scams and pornography.
2. They can create people that do not exist.
3. They can alter any online content.

Select the correct answer using the codes given below:

- a. 1 and 3 only
- b. 1,2 and 3
- c. 1 only

- d. 2 and 3 only

Q.50) Consider the following statements:

1. The Zonal Councils are established under the State's Reorganization Act 1956
2. The state of Sikkim is included in Zonal councils.
3. All the Zonal Councils are headed by the Union Home Minister.

Which of the statements given above is/are correct?

- a. 1 only
- b. 2 and 3 only
- c. 1 and 3 only
- d. 1, 2 and 3

Key Answers

1	b	21	d	41	d
2	d	22	c	42	a
3	b	23	d	43	a
4	b	24	c	44	d
5	d	25	a	45	b
6	c	26	d	46	d
7	d	27	c	47	a
8	b	28	b	48	d
9	a	29	c	49	b
10	b	30	a	50	c
11	d	31	d		
12	c	32	c		
13	c	33	a		
14	d	34	b		
15	a	35	b		
16	a	36	a		
17	b	37	b		
18	a	38	a		
19	a	39	c		
20	a	40	d		