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INDEX

Topic 1. FAMOUS AS AYURVEDIC PARADISE, GANDHAMARDAN HILL RANGE IN ODISHA GETS 'BIODIVERSITY HERITAGE SITE' TAG

Important for subject: Environment

The picturesque Gandhamardan hill range of Odisha has been accorded the tag of 'biodiversity heritage site' — the third such spot in the state **after Mahendragiri hills** in **Gajapati** and **Mandasaru gorge** in **Kandhamal** district.

Issuing a notification to this effect, the **Forest, Environment and Climate Change department** stated that a total 18,963.898 hectares (189.639 square km) of Gandhamardan hill system, spread over 12,431 hectares in Bargarh and 6,532 hectares in Balangir, has been declared a '**biodiversity heritage site'** as per the provisions of Odisha Biodiversity Rules – 2012 to protect its fragile ecosystem.

Why Gandhamardan hill is special?

- A treasure trove of medicinal plants, the hill system within Gandhamardan reserve forest is considered the 'Ayurvedic paradise' of the state.
- As per the government notification, Gandhamardan hill range is famous as 'Ayurvedic paradise' of Odisha' where traditional knowledge holders have been collecting wild medicinal plants to treat different diseases and ailments.
- Two historical monuments — Nrusinghanath temple on the northern slope of the hill and Harishankar temple on the southern slope of the hill — have immense cultural significance, it stated.
- However, the rich biological resources of the cultural landscape are under pressure due to anthropogenic and climatic factors, while the traditional knowledge associated with the bio-resources is also declining, necessitating long-term protection and conservation of the hill range, the department underlined.

Process:

- The Odisha Biodiversity Board (OBB) had sent a proposal to the state government in December last year to declare the threatened and ecologically sensitive landscape as a 'Biodiversity Heritage Site' for long-term protection, conservation and management of biological resources of the hill range having socio-economic, ecological and biological

significance.

- After the Board received proposals from the Biodiversity Management Committee (BMC) of Nandupalla, Telenpalli, Bartunda, Mithapalli as well as proposals from DFO Balangir and Bargarh and other stakeholders to declare the hill range as a biodiversity heritage site, a detailed inventory of the flora and fauna in the hill ecosystem was prepared.
- The board found 1,700 species of plants and animals — 1,200 species of plants and 500 species of animals — in the hill ecosystem. Besides, around 209 trees, 135 shrubs, 473 herbs, 77 climbers and 300 species of medicinal plants were also recorded in the hill ecosystem of which 18 species are tagged as threatened and one species as endemic.

Other Bio heritage sites of Odissa

- Notably, the Odisha government had notified Mahendragiri as the 'biodiversity heritage site' in November 2022, while the Mandasaru gorge in Kandhamal district was the first landscape to be notified as bio heritage site in the state in 2019

Biodiversity Heritage Sites (BHS)-

- Under **Section 37** of **Biological Diversity Act, 2002** the **State Government** in consultation with local bodies may notify the areas of biodiversity importance as Biodiversity Heritage Sites.
- The **Biodiversity Heritage Sites** are the well defined areas that are unique, ecologically fragile ecosystems – terrestrial, coastal and inland waters and, marine having rich biodiversity comprising of any one or more of the following components: richness of wild as well as domesticated species or intra-specific categories high endemism presence of rare and threatened species keystone species species of evolutionary significance wild ancestors of domestic/cultivated species or their varieties past preeminence of biological components represented by fossil beds having significant cultural, ethical or aesthetic values; important for the maintenance of cultural diversity (with or without a long history of human association with them)
- Areas having any of the following characteristics may qualify for inclusion as BHS.

Biodiversity Heritage Site (BHS) – District/State

- Nallur Tamarind Grove – Bangalore, Karnataka
- Hogrekan – Chikmagalur, Karnataka

- University of Agricultural Sciences, – Bengaluru, Karnataka
- Ambaraguda – Karnataka
- Glory of Allapalli – Maharashtra
- Tonglu BHS and Dhotrey BHS under the Darjeeling Forest Division – Darjeeling, West Bengal
- Mandasaru – Odisha
- Dialong Village – Manipur
- Ameenpur lake – Telangana
- Majuli – Assam
- Gharial Rehabilitation Centre – Lucknow, Uttar Pradesh
- Chilkigarh Kanak Durga – West Bengal
- Purvatali Rai – Goa
- Naro Hills – Madhya Pradesh
- Asramam – Kerala
- Schistura Hiranyakeshi – Sindhudurg, Maharashtra
- Arittapatti – Tamilnadu

People's Biodiversity Registers (PBR):

- The **PBRs** focus on participatory documentation of local biodiversity, traditional knowledge and practices.
- The register shall contain comprehensive information on the availability and knowledge of local biological resources, their medicinal or any other use or any other traditional knowledge associated with them.
- They are seen as **key legal documents** in ascertaining the rights of local people over the biological resources and associated traditional knowledge.

Topic 2. INDIA'S DISPUTED COMPENSATORY AFFORESTATION POLICY AT ODDS WITH NEW IPCC REPORT

Important for subject: Environment

The Synthesis Report has found that the climate-mitigating potential of natural ecosystems is second only to solar power.

Not degrading existing ecosystems in the first place **will do more to lower the impact of**

the climate crisis than restoring ecosystems that have been destroyed – a finding that speaks to an increasingly contested policy in India that **has allowed forests in one part of the country to be cut down and 'replaced' with those elsewhere**.

- The finding originates in the Synthesis Report of the Intergovernmental Panel on Climate Change (IPCC), a U.N. expert body that determines the global scientific consensus on the consequences of climate change.
- It is extremely significant that the preservation of natural ecosystems is being recognized as an important means to mitigate climate change. **Sequestered carbon recovers fastest under fast-growing plantations,** but even then, it **will take many decades before it approaches the level of carbon sequestered in a natural forest**.
- In addition to livelihood impacts, biodiversity impacts, and hydrological impacts, the climate impacts of such development projects also **cannot adequately be 'compensated' by compensatory afforestation.**
- IPCC report also found that the **sole option (among those evaluated) with more mitigating potential than "reducing conversion of natural ecosystems" was solar power** and that the third-highest was wind power.
- IPCC report also noted that "**reducing conversion of natural ecosystems" could be more expensive than wind power**, yet still less expensive than "ecosystem restoration, afforestation, [and] restoration", for every GtCO2e.

CAMPA Funds:

- Whenever forest land is diverted for non-forest purposes, it is **mandatory under the Forest (Conservation) Act, 1980 that an equivalent area of non-forest land has to be taken up for compensatory afforestation.**
- In addition to this, funds for raising the forest are also to be imposed on whom so ever is undertaking the diversion. The land chosen for afforestation, if viable, must be in close proximity of reserved or protected forest for ease of management by forest department.
- In 2002, the **Supreme Court (SC) ordered that a Compensatory Afforestation Fund** had to be created in which all the contributions towards **compensatory afforestation and net present value of land had to be deposited.**
- In April 2004, Ministry of Environment and Forests **constituted Compensatory Afforestation Fund Management and Planning Authority (CAMPA)** to overlook and

manage the Compensatory Afforestation Fund (CAF) as directed by the SC.

The authority was termed as the 'custodian' of the fund.

- Further in 2009, the government ordered that **State CAMPAs had to be set up** to boost compensatory afforestation at state level and also manage Green India Fund.
- Despite all these efforts, CAG report in 2013 revealed that the **CAMPA funds remained un-utilized.** The report stated that between 2006 and 2012, CAF with ad hoc CAMPA grew from ₹ 1,200 crores to ₹ 23,607 crores.

Statutory backing

- **Compensatory Afforestation Fund Act, 2016 came into force from 2018**. The Act established a **National Compensatory Afforestation Fund** under the **Public Account of India** and State Compensatory Afforestation Fund under the Public Account of each state.
- The payments made for compensatory afforestation, net present value and others related to the project will be deposited in the fund.
- The **State Funds will receive 90% of the payments while National Fund will receive remaining 10%.** These funds will be regulated by State and National CAMPA.
- The Ministry also stressed that the **fund had to be used for important needs such as Compensatory Afforestation, Catchment Area Treatment, Wildlife Management**, Assisted Natural Regeneration, **Forest Fire Prevention** and Control Operations, Soil and Moisture Conservation Works in the forest, Improvement of Wildlife Habitat, Management of Biological Diversity and Biological Resources, **Research in Forestry and Monitoring of CAMPA works and others.**

Topic 3. GREAT SALT LAKE WON'T GO THE ARAL SEA AND LAKE URMIA WAY

Important for subject: Environment

Down To Earth speaks to Kevin Perry from the University of Utah on the Great Salt Lake in the American West.

- United Nations is holding a global water conference in New York City from March 22-24, 2023. Ironically though, the host of the conference, the **United States has been witnessing an ecological disaster** that now seems to be irreversible. The **Great Salt Lake, in the US state of Utah**, is the largest saltwater lake in the western hemisphere.
- Great Salt Lake (GSL) is a terminal basin lake that has **shrunk dramatically in the last 35 years due to a combination of climate change, drought, and unsustainable water diversion from tributary streams.**
- The **lake elevation has decreased by 17 feet** and the **surface area of GSL has decreased by more than half**, exposing more than 800 square miles of the lakebed to the atmosphere.
- **Strong winds occasionally generate dust plumes** from the exposed lakebed which move into the surrounding communities where more than 2.5 million people reside.
- Utah has received **record snow amounts in the mountains** this year and the lake has already **risen by 2 feet**. The lake will **likely rise by an additional two or three feet** when the mountain snow melts. The **lake typically loses 2.5 feet of water during the summer due to evaporation**. Thus, the net result of the record breaking snow year is

likely to be an increase of 2 to 2.5 feet.

- The people of Utah have let their leaders know that **saving GSL is a priority**. Failure to save the lake will **lead to significant economic losses and threats to human health**.

Great Salt Lake:

- The Great Salt Lake **is located in northern Utah, surrounded by the Wasatch Mountains** to the east and the Great Basin Desert to the west.
- The Great Salt Lake is the **largest saltwater lake** in the Western Hemisphere, **covering an area of approximately 1,700 square miles.**
- The Great Salt Lake was **formed around 10,000 years ago** by the **drying up of prehistoric Lake Bonneville.** The lake's salt content is due to the fact that **it has no natural outlets**, causing the water to become concentrated with salt and other minerals.
- The lake's three major tributaries, the **Jordan, Weber, and Bear rivers.** The Great Salt Lake is extremely salty, with a **salinity level of around 12-15%**.
- This makes it **one of the saltiest bodies of water in the world**, and the high salt content has created unique ecosystems and land formations around the lake.
- The Great Salt Lake is an important economic resource for the state of Utah, providing **opportunities for mineral extraction, salt production, and recreation**.
- The lake is also a popular tourist destination, with several state parks and wildlife refuges located around its shores.
- The Great Salt Lake is **home to a diverse range of wildlife, including several species of migratory birds**, such as the American avocet and the western sandpiper. The lake also supports a number of brine shrimp and brine fly populations, which are important food sources for birds and other wildlife.
- **Environmental concerns**: The Great Salt Lake is facing several environmental challenges, including **water diversions, climate change, and pollution** from human activities such as **mining and agriculture**. These issues have led to declining water levels and ecosystem degradation.

Aral Sea

- The Aral Sea was once the fourth-largest lake in the world. But in the 1960s, the Soviet Union diverted two major rivers to irrigate farmland, cutting off the inland sea from its

source. The Aral Sea has been slowly disappearing ever since. It was an end orheic lake lying between Kazakhstan (Aktobe and Kyzylorda Regions) in the north and Uzbekistan (Karakalpakstan autonomous region) in the south which began shrinking in the 1960s and had largely dried up by the 2010s. The name roughly translates as "Sea of Islands", referring to over 1,100 islands that had dotted its waters. In the Mongolic and Turkic languages, *Aral* means "island, archipelago". The Aral Sea drainage basin encompasses Uzbekistan and parts of Tajikistan, Turkmenistan, Kyrgyzstan, Kazakhstan, Afghanistan, and Iran.

Lake Urmia

- Lake Urmia in the northwestern corner of Iran is one of the largest permanent hypersaline lakes in the world and the largest lake in the Middle East (1,2,3). It extends as much as 140 km from north to south and is as wide as 85 km east to west during high water periods (4). The lake was declared a Wetland of International Importance by the Ramsar Convention in 1971 and designated a UNESCO Biosphere Reserve in 1976 (5,6). The lake itself is home to a unique brine shrimp species, Artemia urmiana, and along with the surrounding wetlands and upland habitat, it supports many species of reptiles, amphibians and mammals. Lake Urmia provides very important seasonal habitat for many species of migrating birds. Around 200 species of birds have been documented on and surrounding the lake including pelicans, egrets, ducks, and flamingos (7). The watershed of the lake is an important agricultural region with a population of around 6.4 million people; an estimated 76 million people live within a radius of 500 km (8).

Topic 4. INDIA'S CAMPA IS AT ODDS WITH IPCC REPORT

Important for subject: Environment

The **Synthesis Report of the IPCC has said that safeguarding and conserving the existing ecosystems in the first place will play a better role in mitigating the impact of the climate crisis rather than efforts to restore ecosystems that have already been degraded.**

These findings of the report by the IPCC have shed focus on CAMPA Law, which has been a controversial policy in India.

CAMPA allows for the cutting down of forests in one part of the country which can be replaced or compensated with afforestation elsewhere.

How India's Compensatory Afforestation Policy is at odds with IPCC's Synthesis Report?

- Afforestation is codified in **the Compensatory Afforestation Fund Management and Planning Authority (CAMPA).**
- CAMPA is meant to promote afforestation and regeneration activities as a way of compensating for forest land diverted to non-forest uses. It was established on the Supreme Court's orders in 2002.
- **Afforestation is also a part of India's climate pledges** – The government has committed to adding "**an additional (cumulative) carbon sink of 2.5-3 GtCO2e through additional forest and tree cover by 2030".**

'**GtCO2e' stands for gigatonne of carbon-dioxide-equivalent**.

- However, the IPCC's latest Synthesis Report has pointed out that not degrading existing ecosystems in the first place will do more to lower the impact of the climate crisis than restoring ecosystems (through afforestation) that have been destroyed.
- When forest land is diverted to non-forest use, such as a dam or a mine, that land can longer provide its historical ecosystem services nor host biodiversity.
- The report also highlights that climate action, such as technologies to combat climate change, renewable energy farms, etc. should not come at the cost of natural ecosystems.

Compensatory Afforestation Fund Management and Planning Authority (CAMPA):

- Whenever **forest land is diverted for non-forest purposes**, **it is mandatory under the Forest (Conservation) Act, 1980 that an equivalent area of non-forest land has to be taken up for compensatory afforestation.**
- In addition to this, funds for raising the forest are also to be imposed on whomever is undertaking the diversion. The land chosen for afforestation, if viable, must be in close proximity of reserved or protected forest for ease of management by forest department.
- In 2002, the **Supreme Court (SC) ordered that a Compensatory Afforestation Fund had to be created** in which all the contributions towards compensatory afforestation and net present value of land had to be deposited.

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Statutory backing

- **Compensatory Afforestation Fund Act, 2016** came into force from 2018. The Act established a **National Compensatory Afforestation Fund** under the **Public Account of India and State Compensatory Afforestation Fund under the Public Account of each state.**
- The payments made for compensatory afforestation, net present value and others related to the project will be deposited in the fund.
- The **State Funds will receive 90% of the payments while National Fund will receive remaining 10%.** These funds will be **regulated by State and National CAMPA**.
- The Ministry also stressed that the fund had to be used for important needs such as Compensatory Afforestation, Catchment Area Treatment, Wildlife Management, Assisted Natural Regeneration, Forest Fire Prevention and Control Operations, Soil and Moisture Conservation Works in the forest, Improvement of Wildlife Habitat, Management of Biological Diversity and Biological Resources, Research in Forestry and Monitoring of CAMPA works and others.

Criticism of CAMPA:

- The money paid sits in a fund overseen by the CAMPA. **As of 2019, the fund had ₹47,000 crore.**
- The CAMPA has come under fire for facilitating the destruction of natural ecosystems in exchange for forests to be set up in faraway places.
- Research has found that nature ecosystems sequester more carbon.

About IPCC Assessment Reports:

- The **IPCC prepares comprehensive Assessment Reports** about knowledge on climate

change, its causes, potential impacts and response options.

- **Since its inception in 1988**, the IPCC has had **six assessment cycles and delivered six Assessment Reports,** the most comprehensive scientific reports about climate change produced worldwide.
- The **current report, 6th Assessment Report, is divided into three segments** etc. its three Working Groups and a Synthesis Report.

The three working group reports have already been published.

- This **Synthesis Report of the IPCC Sixth Assessment Report (AR6)** summarizes the state of knowledge of climate change, its widespread impacts and risks, and climate change mitigation and adaptation.
- It integrates the main findings of the Sixth Assessment Report (AR6) based on contributions from the three Working Groups, and the three Special Reports.

Topic 5. BENGALURU'S CIVIC BODY DUMPED MUD ON THE HOSAKEREHALLI LAKE

Important for subject: Environment

The lake located in Rajarajeshwari Nagar has been in need of restoration for the last few years. But residents living in the vicinity of the lake saw BBMP trucks dumping huge mounds of mud into it.

Trucks dumping huge mounds of mud on Bengaluru's Hosakerehalli lake in Rajarajeshwari Nagar recently alarmed local residents and environmentalists, who shared photos on social media and demanded a response from the authorities. In two weeks, it was observed that a 25 feet-wide road was being constructed on the lake.

Initially, officials from the civic body Bruhat Bengaluru MahanagaraPalike (BBMP) denied any project being undertaken but they have now said the mud will be removed.

Hosakerehalli lake

- Hosakerehalli Lake is a **man-made lake** located in the southwestern part of Bengaluru city in the Indian state of Karnataka
- The Hosakerehalli Lake **was built in the 16th century during the reign of Kempe**

Gowda, the founder of Bengaluru. Over time, the lake became an important source of water for irrigation and drinking.

- Hosakerehalli Lake is home to a wide variety of bird species, including migratory birds like the **spot-billed pelican, Eurasian coot, and common teal**.
- The lake is connected to several other water bodies in the area, including the **Vrishabhavathi River, which is a major tributary of the Arkavathy River**.
- The lake provides important **ecosystem services such as groundwater recharge, flood control,** and habitat for a variety of plant and animal species. It is also an important recreational space for local residents.

Threats to lake:

- The **waste collected from houses and poultries is dumped** in the lake.
- Even the medicinal waste is dumped here.
- The **untreated sewage** from Sapthagiri layout **enters** the lake.
- The **borewells have been dug** on the lake bed.
- **Encroachment** of areas around them
- The **funds** which are released in the name of funding **to restore the lake are not being utilised.**

Lakes

- Lakes **are defined by the National Lake Conservation Program** (NLCP) as standing **water bodies with a minimum water depth of 3 m, a water spread of more than ten hectares**, and no or very little aquatic vegetation.
- Lakes are a diverse group of inland freshwater ecosystems found all over the world.

Importance of Lakes

- **Water Cycle:** Lakes are a crucial aspect of the water cycle because **they collect all of the water in a certain area**. The watershed, or all the streams and rivers that feed into a single lake, filters the water.
- **Transportation and Commerce**: Lakes have served as transportation and commercial channels for ages.
- **Source of Water:** Many settlements get their water from lakes. Drought-resistant water is

stored in artificial lakes. **Dam-created lakes also produce hydroelectric power**.

- **Crop Irrigation:** Farmers irrigate their crops with lake water. Farmers benefit from the climate effect of particularly large lakes.
- **Recreation Sites**: Lakes are popular recreation sites because they are quite attractive.
- **Permanent Residence:** Lakes are permanent homes for certain groups of people **Lake Effect: Winds blowing** from lakes help to **make the climate more equal** because water does not heat or cool as quickly as land.

National Lake Conservation Plan (NLCP)

- Since 2001, the Ministry of Environment and Forests has been implementing the National Lake Conservation Plan (NLCP) **to conserve and manage polluted and degraded lakes in urban and semi-urban areas.**
- An integrated scheme, NPCA, **combining the National Lake Conservation Plan and the National Wetlands Conservation Program** was created to avoid overlap, promote better synergies, and ensure conservation and management work.
- The new scheme will include conservation and management of lakes and wetlands in the country, including an inventory and information system on lakes and wetlands, a national level directive on lake and wetlands criteria, a regulatory framework, capacity building at the state government and local body levels, evaluation, and so on.
- Its goal was of conserving aquatic ecosystems (lakes and wetlands) through the implementation of long-term conservation plans governed by uniform policy and guidelines.

NLCP – Aim & Objectives

- The National Lake Conservation Plan **aims at comprehensive conservation and restoration of lakes and wetlands** for **attaining desired water quality** enhancement in addition to improvement in biodiversity and ecosystem.
- It was planned to be conducted through an integrated and interdisciplinary strategy with a shared regulatory framework.
- This program would **promote biodiversity, lower pollutant loads**, and the commodities and services that these bodies of water provide to the stakeholders.
- Through an **integrated ecosystem approach**, to restore and conserve the country's urban

and semi-urban lakes that have degraded due to waste water discharge into the lake, as well as other unique freshwater eco systems.

Topic 6. NGT SLAPS ₹10 CRORE PENALTY ON KERALA GOVERNMENT FOR FAILURE TO PROTECT RAMSAR SITES

Important for subject : Environment

The Principal Bench of the National Green Tribunal in New Delhi has slapped a penalty of ₹10 crore on the Kerala government for its failure to check the indiscriminate pollution of the Vembanad and Ashtamudi lakes, listed as Ramsar sites.

- The Bench, led by its chairperson Adarsh Kumar Goel, said that the penalty imposed **on the basis of the 'polluter pays principle'** had to be deposited in a ring-fenced account to be operated under the authority of the Chief Secretary.
- The deposit had to be made within a month, it said while disposing of a petition alleging **failure of statutory and administrative authorities in taking remedial action for protection of the Vembanad and Ashtamudi lakes hit by illegal waste dumping**.
- The penalty of ₹10 crore had to be utilised for **conservation/restoration measures** by preparing an action plan to be preferably executed within six months.
- The Bench said the report depicted the **disappointing state of affairs in ensuring the mandatory duty of protecting wetlands**, which are Ramsar sites, in spite of binding

orders of the Supreme Court in similar cases.

Action taken at the State level was also inadequate to remedy the situation.

- The State cannot plead helplessness in implementing guaranteed rights of the citizens and also in taking stringent measures for protection of environment and public health.

Polluter Pays Principle

- Polluter Pays Principle (PPP) states that **those who pollute the environment should bear the costs of their actions** to prevent or mitigate damage to the environment. The PPP is based on the idea that the polluter should pay for the costs of pollution, rather than passing them on to others.
- The PPP was **first introduced in 1972 by the Organisation for Economic Cooperation and Development (OECD)** in its Guidelines for Multinational Enterprises. The principle has since been incorporated into various international environmental treaties and agreements, including the Rio Declaration on Environment and Development.

Vembanad Lake

- Vembanad Lake is **also known as**VembanadKayal, VembanadKol, Punnamada Lake (in Kuttanad) and **Kochi Lake** (in Kochi). Spanning several districts of Kerala and covering a territory of more than 2033.02 km2.
- The lake has its **source in four rivers**, Meenachil, Achankovil, Pampa and Manimala It is **separated from the Arabian Sea by a narrow barrier island** and is a popular backwater stretch in Kerala.
- Vallam Kali (i.e Nehru Trophy Boat Race) is a **Snake Boat Race held every year** in the month of August in Vembanad Lake.
- In 2002, it was **included in the list of wetlands of international importance, as defined by the Ramsar Convention.**
- It is the **second-largest Ramsar site in India** only after the Sundarbans in West Bengal.
- The Government of India has identified the Vembanad wetland under the National Wetlands Conservation Programme. The **Kumarakom Bird Sanctuary** is located on the east coast of the lake.
- In 2019, Willingdon Island, a seaport located in the city of Kochi, was carved out of Vembanad Lake.

- One of the most outstanding features of this lake is the 1252 m long saltwater barrier, Thanneermukkom, which was built to stop saltwater intrusion into Kuttanad.

Ashtamudi Lake

- Ashtamudi Lake or Ashtamudi Kayal, in the **Kollam District** of the Indian state of Kerala, is the most visited backwater and lake in the state.
- It **possesses a unique wetland ecosystem** and a large palm-shaped (also described as octopus-shaped) water body, second only in size to the Vembanad estuary ecosystem of the state. Ashtamudi **means 'eight braids'** in the local Malayalam language.
- The name is **indicative of the lake's topography** with its multiple branches.
- The lake is also called **the gateway to the backwaters of Kerala** and is well known for its houseboat and backwater resorts.

  Ashtamudi Wetland was **included in the list of wetlands of internationalimportance**, as defined by the Ramsar Convention for the conservation and sustainable utilization of wetlands.

Topic 7. UN WATER CONFERENCE 2023

Important for subject: Environment

UN 2023 Water Conference in New York culminated with a breakthrough response to the global water crisis, with governments, businesses and civil society committing billions of dollars to **advance the water agenda**, a dealmaker for accelerating sustainable development overall.

- Some 10,000 participants gathered at UN Headquarters and online from 22 to 24 March 2023, to **urgently scale up action to address the water crisis and ensure equitable access to water for all**.
- **Co-hosted by the Kingdom of the Netherlands and the Republic of Tajikistan**, the Conference brought together world leaders, civil society, business leaders, young people, scientists, academics, the UN System and others from across sectors — agriculture, energy, environment and water — around a common goal: **to urgently tackle the water crisis** and set the world back **on track to achieving Sustainable Development Goal 6 – On Clean Water and Sanitation**.
- To achieve this, the Secretary-General highlighted key game-changers: **from reinforcing**

water's place as a fundamental human right and reducing the pressures on the hydrological system, to **developing new, alternative food systems to reduce the unsustainable use of water in food production and agriculture** and designing and implementing a new global water information system to guide plans and priorities by 2030.

- The Secretary-General also advocated for i**ntegrating the approach on water, ecosystems and climate to reduce greenhouse gas emissions** and **strengthen communities — from resilient infrastructure, water pipelines and wastewater treatment plans**, to ensuring every person in the world is protected with early warning systems against natural disasters by 2027; and **continued to press for climate justice** and **global action to limit global warming to a 1.5-degree rise**.
- Lastly, he called for a **dramatic acceleration in resources and investment** into the ability of all countries to reach SDG 6.
- **UN 2023 Water Conference – A watershed moment for the SDGs** Access to safe water, sanitation and hygiene is the **most basic human need for health and well-being**, and a declared human right. But some **2 billion people around the world still lack access to safe drinking water** and 40 per cent of the world's population are affected by water scarcity.
- **Agriculture demands alone account for some 70% of water usage**. Adding to the pressure, more than 90 per cent of disasters are water-related, with climate change hitting hardest through water. And humanity's demand for water keeps growing, with pressure on fresh water projected to increase by more than 40 per cent by 2050.
- Against this background, conference **deliberations ranged from the urgency of the water crisis, including its role in forced migration, climate change and conflicts** to stressing its critical link to good health, poverty reduction and food security.
- Attention was also given to solutions, with **deliberations spanning the need for better data collection, enhanced governance systems, capacity development opportunities** and funding gaps in the water sector.

Transformative Water Action Agenda

- Water Action Agenda, the key outcome of the Conference, **captured over 700 commitments aimed at driving transformation from a global water crisis to a water-secure world**. The agenda represents the global community's bold resolve to address the

water challenges through a more coordinated and results-driven approach. A number of other follow-up steps are also under consideration – including the **appointment of a Special Envoy on Water.**

- The conference outcomes will also receive **concrete follow-up in three key upcoming Summits:** the SDG Summit during the UN General Assembly in September 2023, the Summit of the Future in 2024, the World Social Summit in 2025, and through the annual High- level political forum on sustainable development, Conference of Parties and other United Nations processes, as well as the Dushanbe Water Process.

Commitments of Member States:

- The **US announced a commitment of up to $49 billion** in investments to support climate-resilient water and sanitation infrastructure and services.
- **Japan will proactively contribute to the solution of water-related social issues** faced by the Asia-Pacific region by developing "quality Infrastructure", providing financial assistance worth approximately 500 billion yen ($3.65 billion) over the next five years.
- **Vietnam pledged to develop policies for major river basins management** by 2025 and to ensure all households would have access to clean running water by 2030.
- **Switzerland submitted 5 commitments to contribute to the UN's work**, including in the areas of the Water Convention and transboundary cooperation. Switzerland is the co-chair of the Interactive Dialogue on Water for Cooperation.
- With the **Continental Africa Investment Program** (AIP), the African Union Commission aims to close Africa's water investments gap by mobilizing at least US$30 billion/year by 2030 through a range of initiatives, including the International High-Level Panel on Water
- By 2030, the **EU aims to support the access of 70 million individuals to an improved drinking water sourc**e and/or sanitation facility. The EU will also support Member States with €20 million funding to accelerate the deployment of wastewater surveillance for COVID-19.
- **India** has committed investments of over $240 billion in the water sector and is **implementing the largest dam rehabilitation programme** in the world as well as efforts to restore groundwater level.

Topic 8. IN UTTARAKHAND, POINT AND SHOOT PLASTIC

Important for subject: Environment

The Himalayan State is implementing a **QR code-based project to prevent littering** the Char Dham route with plastic bottles and packets.

The Uttarakhand government has chosen the **CharDham yatra route** that includes temples at Badrinath, Kedarnath, Gangotri, and Yamunotri to implement a **unique waste-disposal system in the Himalayas**.

- Hemkund Sahib and the Valley of Flowers will also see the implementation of a **QR code-based system that will streamline collection of waste and reduction** of garbage along the route.
- **Visitors will scan a QR code on each plastic bottle and multi-layer plastic bag** (of chips or biscuits) **and pay a deposit** over the maximum retail price (MRP). They can **claim this amount back as a refund when they deposit the waste at a point** at the end of the yatra.
- Last year, the project was piloted during the summer months, and executed compulsorily in Kedarnath, en route to the centuries-old Shiva temple on the banks of the Mandakini river.
- The project last year saved 1.63 lakh single-use plastic bottles from entering the fragile mountain ecosystem.

Importance of Himalayas

- **Source of Rivers:** Abundant rainfall and vast snow-fields as well as large glaciers in Himalayas are the feeding grounds of the mighty rivers of India.
- Critical for Energy Security: Almost **33% of the country's thermal electricity** and 52% of its hydropower is dependent on river waters originating in the Himalayas.
- **Sustaining the Monsoon**: The Himalayas play a very significant role in **influencing the climate of India.** By virtue of their high altitude, length and direction, they effectively intercept the summer monsoons coming from the Bay of Bengal and Arabian Sea and cause precipitation in the form of rain or snow.
- **Tourism:** By virtue of their **scenic beauty and healthy environment**, the Himalayan

ranges have developed a large number of tourist spots.

Challenges in the region:

- **No Proper Waste Management**: The cities of the Himalayas are growing and beginning to see the same root as the cities of the plains from **mountains of garbage and plastic, untreated sewage, unplanned urban growth and even local air pollution** because of vehicles.
- **Unsustainable Tourism**: Unfortunately, our mountains are **treated only as tourist destinations without realizing that over draining resources beyond a point can be disastrous**.
- **Climate Change**: **Melting ice and snow due** to climate change form new glacial lakes, as well as increase the volumes of existing ones. This could raise the **threat of glacial-lake outburst floods.**

Extended Producer Responsibility

- Extended Producer Responsibility (EPR) is a **policy approach that holds producers responsible for the entire lifecycle of their products**, including their environmental impact. EPR is based on the principle that the **producer of a product should bear the responsibility for the environmental and social impact** of that product, even after it has been sold and used.
- This includes the **collection, reuse, recycling, and proper disposal** of products and their packaging. EPR **shifts the burden of waste management from local governments and taxpayers** to the producers, who have the knowledge and resources to design and manage a sustainable product life cycle.

EPR typically includes the following components:

- **Product design:** Producers are encouraged to **design products that are more durable, repairable, and recyclable.**
- **Collection and recycling**: Producers are responsible for setting up collection and recycling systems for their products, and ensuring that the products are properly recycled or disposed of.
- **Financing:** Producers are required to finance the collection and recycling of their products, either through direct payment or through contributions to a producer

responsibility organization.

- **Reporting**: Producers are required to report on their EPR activities, including the amount of waste generated, the amount of waste collected and recycled, and the costs of EPR.

Topic 9. CHAR DHAM

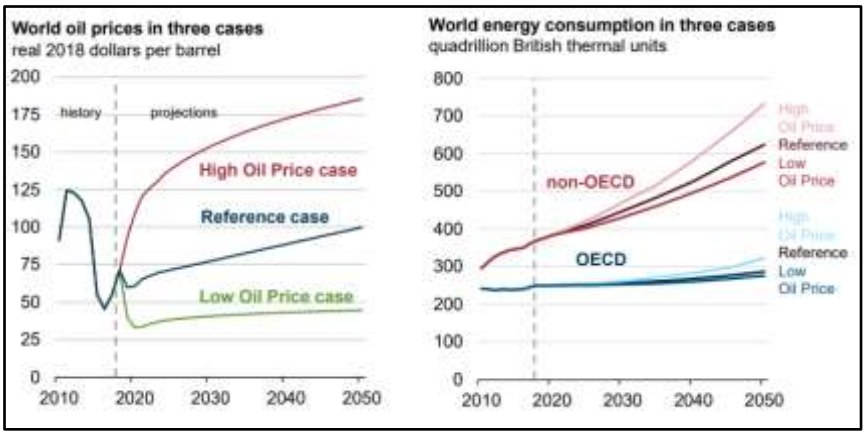
Important for subject : Environment

Char Dham means Four Dhams i.e. **Four religious places**. Char Dham in Uttarakhand is a **collective term used for religous circuit** covering Holy hindu pilgrimage centres of **Badarinath, Kedarnath, Gangotri and Yamunotri.**

- All four temple shrines are located in **Garhwal Himalayas range of Uttarakhand**.
- This is considered as **most sacred religious places to be visited by Hindus**, to get rid of their sins and pave path to ultimate goal of human life – the Moksha. **Yamunotri:** The first shrine of chota chardham, this temple is **dedicated to River Yamuna** (Hindu Goddess, Daughter of Sun God).It is situated in Gharwal Region of Uttarakhand State.
- **Gangotri:** The temple is **devoted to Goddess Ganges** (Most sacred River in India). It is second shrines of chota chardham circuit.
- **Kedarnath:** The temple is **devoted to God Shiva**. There is **12 main Jyotirlinga** of shiva & Kedarnath is one of the main jyotirling. Third shrine of chota chardham.
- **Badrinath:** The temple is **dedicated to God Vishnu**. It is also the part of main Chardham Circuit in India & forth shrine of Chota chardham Yatra.

Topic 10. GLOBAL INITIATIVE "50 BY 2050"

Important for subject: Environment



COP27: Global initiative "50 by 2050" targets waste colonialism in fight against Africa pollution. **Egyptian government** is launching a **global waste initiative dubbed "50 by 2050"** that aims to **ensure at least half of all African waste is treated and recycled** before 2050.

Announced at the COP27 climate summit in Sharm el-Sheikh, proponents say the ambitious targets could **reduce the "waste colonialism" plaguing African countries.**

Global Alliance for Incinerator Alternatives (GAIA) held a press conference with Friends of the Earth Nigeria to provide civil society's perspective on the goals.

A UK-based startup, based at Imperial College in London, claims to have **developed a technology that could alter the state of plastics and make them biodegradable**. The company calls the process **"biotransformation"**. It claims the technology would **digest the plastic packaging waste naturally with the help of microbes and biodegrade** the waste without leaving behind any micro plastics.

Decolonizing packaging waste

- According to Niven Reddy, regional coordinator for GAIA Africa **Waste, pollution and the environmental and human health harms it creates are not only generated in Africa**.
- Large amounts of **waste are created through non-recyclable packaging** coming from companies in the global north. They produce materials that cannot be recycled in places **lacking the necessary waste management infrastructure**.

- Global leaders can support Africa **by bringing an end to waste colonialism**, both by **creating policies to reduce single-use plastic** marketed in the global south and **preventing the transfer trade of waste from the global north to the south.**

Legal waste exportation also opens the doors for illicit waste trafficking.

- Handlers can smuggle illegal forms of toxic waste inside authorized shipping containers. The European Anti-Fraud Office estimates illegal waste trafficking to be worth over US$10 billion annually – more than the human trafficking trade.

Tackling African waste

- Achieving the goals of 2050 can be done by recognizing that we need to embrace the different starting points of each country in Africa and that **improving recycling rates** must be **centered around waste picker integration**.
- Many workers throughout the continent **rely on informal waste collection labor to survive**. This **job market should be protected and improved** before novel solutions like advanced recycling and incineration projects.
- The initiative must focus on job-generating and inclusive solutions, **discarding industry-led initiatives like incineration and chemical recycling and ensuring that waste pickers and waste cooperatives are formative parts** of the models to be adopted.

Topic 11. GLOBAL ALLIANCE FOR INCINERATOR ALTERNATIVES (GAIA)

Important for subject : Environment

The Global Alliance for Incinerator Alternatives (GAIA) is an **international organization working to promote sustainable and just solutions** to waste management. GAIA **works with community-based organizations, nongovernmental organizations, and policy makers** to promote waste reduction, recycling, and composting, and to oppose incineration and landfills as harmful waste management practices.

- GAIA was **founded in 2000** as a global network of grassroots organizations working on waste issues. Its mission is to promote sustainable waste management solutions that protect public health, the environment, and human rights.
- GAIA **works on a range of issues related to waste management, including zero waste, toxic pollution, climate change, and the circular economy**. Its programs include

research and policy advocacy, capacity building and training, and media and communications.

- GAIA **promotes the concept of zero waste**, which aims to reduce waste generation and maximize recycling and composting. This **approach prioritizes waste reduction and reuse, and encourages the development of local, community-based solutions** to waste management.
- GAIA opposes the **use of incineration and landfills as harmful and unsustainable waste management practices**. Incineration releases toxic pollutants into the air and generates greenhouse gas emissions, while landfills can lead to soil and water contamination and contribute to climate change.
- GAIA **works with policy makers at the local, national, and international levels to** promote sustainable waste management policies and regulations. This includes **advocating for extended producer responsibility** (EPR) policies that hold manufacturers responsible for the end-of-life management of their products.

Biotransformation technology:

- Biotransformation technology is a process that **uses microorganisms to transform organic compounds into less toxic or more useful products**. It is a sustainable alternative to traditional chemical synthesis methods, as it is typically less energy-intensive and generates less waste.
- Biotransformation can be **used to transform a variety of organic compounds**, including chemicals used in pharmaceuticals, pesticides, and food additives. The two main types of biotransformation are **biodegradation**, which **breaks down complex organic molecules into simpler compounds**, and **biotransformation**, which **modifies the structure of organic compounds to produce more useful or less toxic products**.
- Biotransformation **relies on microorganisms, such as bacteria and fungi**, to carry out the chemical transformations. These microorganisms can be found in a variety of environments, including soil, water, and the human gut.
- Plastics **made using this technology are given a pre-programmed** time during which the manufactured material looks and feels like conventional plastics without compromising on quality. **Once the product expires and is exposed to the external environment, it self-destructs and bio-transforms** into bioavailable wax.
- This wax is then consumed by microorganisms, converting waste into water, CO2, and

biomass. Biotransformation technology is the **world's first that ensures polyole fins fully biodegrade in an open environment** causing no micro-plastics.

Topic 12. MPS' GROUP MULLS OVER CHARTER OF DEMANDS TO COMBAT AIR POLLUTION

Important for subject: Environment

Taking note of the poor air quality in various parts of the country and its impacts on human health, the PGCA held a two-day 'Clean Air workshop' with the MPs in Gurgaon over the weekend.

- Parliamentarians Group for Clean Air (PGCA), a consortium of 35 MPs across party lines, **launched a compendium to empower their peers to monitor factors impacting levels of air pollution in their constituencies** and seek answers for better implementation of government policies.
- The effort was facilitated by Swaniti Initiative, which serves as the secretariat to the PGCA.
- Taking note of the poor air quality in various parts of the country and its impacts on human health, the **PGCA held a two-day 'Clean Air workshop' with the MPs** in Gurgaon over the weekend.
- The group **deliberated on a charter of demands** that will be presented to the Union Minister for Environment, Forest and Climate Change.
- The charter framed by the MPs says that **there should be an integration of air quality with public health in policy matters and pushes for the installation of infrastructure** in rural and urban areas alike to capture even finer pollutants.
- The charter says that governments **need to encapsulate an airshed approach at the municipal or city-level**. It has also **recommended international cooperation to reduce the effects of trans boundary effects of air pollution.**
- The MPs have further **recommended partnerships of industries with the government** and other stakeholders to adopt clean air initiatives.

Topic 13. INDIA SUPPORTS MARINE PROTECTED AREAS IN ANTARCTICA TO CONSERVE OCEAN LIFE

Important for subject: Environment

India will continue to support setting up two Marine Protected Areas (MPA) in Antarctica to protect marine life and its ecosystem services, Union minister of state (independent charge) for science and technology and earth sciences.

- A 2022 study that analysed over forty years of krill fishery data found that **krill fishing was highest in the regions** surrounding the Western Antarctic Peninsula and near the South Orkney Islands.
- The **Southern Ocean has two MPAs** — one in the **southern shelf of the South Orkney Islands and the other in the Ross Sea**. These fully protect only 5 per cent of the ocean.
- **All types of fishing, other than scientific research, are prohibited** within the southern shelf of the South Orkney Islands MPA. Discharges and dumping from fishing vessels are also not allowed.
- In the Ross MPA, **72 per cent of the waters are closed to commercial fishing**. **No further MPAs have been established** despite three further MPAs being at advanced stages of development.
- Since 2012, the **European Union and Australia have proposed an MPA in East Antarctica**. An MPA was proposed in the **Weddell Sea by the EU and Norway** and in the waters surrounding the Antarctic Peninsula by Chile and Argentina.
- In 2021, India extended its support for designating East Antarctica and the Weddell Sea as MPA.

- **China and Russia blocked these efforts** at the 41st annual meeting of the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR).
- If the proposed MPAs take form in Antarctica, **they will contribute to the United Nations 30×30 Framework**, which aims to protect 30 per cent of the world's land and sea.

Commission for the Conservation of Antarctic Marine Living Resources

- The Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR) is an **international organization established in 1982** to manage and conserve the marine living resources in the Southern Ocean.
- The **Southern Ocean surrounding Antarctica is one of the last remaining wilderness** areas on earth, with unique and fragile ecosystems that support a diverse range of marine species, including whales, seals, and penguins.
- CCAMLR was established **under the Convention on the Conservation of Antarctic Marine Living Resources** (CAMLR Convention) to **ensure the sustainable management of the living resources in the Southern Ocean.**
- CCAMLR is **made up of 26 member countries and the European Union**, representing the majority of the countries with an interest in the Southern Ocean.

Membership is open to all countries that accede to the CAMLR Convention.

- CCAMLR **has adopted a number of measures to protect the Southern Ocean ecosystem**, including the establishment of large-scale marine protected areas and conservation measures for vulnerable marine ecosystems.
- CCAMLR **has also taken measures to manage fisheries in the Southern Ocean**, including **setting catch limits** for key species such as krill and tooth-fish, and requiring fishing vessels to adhere to strict environmental and conservation regulations.

Topic 14. MANUL: THE 'GRUMPIEST CAT'

Important for subject: Environment

The presence of the manul, a cold-adapted wild cat the size of a domestic cat, has been confirmed on the slopes of the world's highest mountain. The confirmation by DNA testing **marks the first time the elusive cat has been formally recorded in Nepal's eastern**

Himalayan region.

Manuls were first recorded in the western Himalayas, in India, in the late 80s, and again in early 2000s. Then, in September 2007, conservationist Pranav Chanchani, from the Wildlife Institute of India, photographed one of the cats in the eastern Himalayas, in Sikkim.

Conservationists say the latest finding can help inform conservation actions for the species, including the protection of its prey.

Manul

- The manul, also known as Pallas's cat, is a **small wild cat that is adapted to life in cold and arid environments**. It is **roughly the size of a domestic cat** and **is found in the high-altitude grasslands and montane steppe** regions of Central Asia.
- The manul belongs to the Felidae family and the Otocolobus genus. It is one of the oldest known cat species, with a lineage that dates back over 5 million years.
- The manul is found in **high-altitude grasslands and montane steppe regions of Central Asia,** including parts of China, Mongolia, Kazakhstan, Kyrgyzstan, and Russia. It **prefers rocky terrain with sparse vegetatio**n, and is well adapted to the harsh, cold climate of these regions.
- The manul has a **stocky build and a round face** with broad cheeks and a short, flattened snout. Its **fur is dense and long**, with a grayish-brown base color and dark spots and stripes on the face, neck, and legs. Its ears are short and tufted, and its tail is thick and banded.
- The manul is **adapted to survive in cold and arid environments**. Its dense fur provides insulation against the cold, and it has **a low metabolic rate** that allows it to conserve energy in times of scarcity. Its broad, padded paws help it move over snow and ice, and its short, wide head and body help it retain heat.
- The manul is a **solitary animal that is primarily active at dawn and dusk**. It is territorial and marks its range with scent marks and claw scratches. It is also **known for its distinctive vocalizations**, which include growls, hisses, and purrs.
- The manul is a **carnivorous predator that feeds on small mammals such as rodents, pikas**, and birds. It is a **skilled hunter that stalks and pounces** on its prey, and it is also able to climb trees and hunt from elevated positions.

Threats: It includes habitat loss, hunting, and fragmentation of populations.

- **Conservation Status:** The Manul is listed as **Least Concern** by the International Union for Conservation of Nature (IUCN)

Topic 15. UNLEASHING THE POTENTIAL OF RHODODENDRONS

Important for subject: Environment

Rhododendron arboreum from the Garhwal Himalaya's, stands tall as an emblem of hope, contributing to the alleviation of poverty and nurturing sustainable development in these communities.

Rhododendrons:

- Rhododendron owes its name to the Greek words "rhodo," meaning "rose," and "dendron," meaning "tree."
- The species is a **member of the Ericaceae family** and predominantly found in the Himalayas, ranging from 1200 to 4000 meters. The tree can **grow up to a towering height of 20 meters**, **bearing dark green leaves** that measure between 3-7 inches, coated with silvery or brown fur underneath.
- This species is **primarily grown in the North Temperate Zone** and thrives in moist acidic soils. It originates from the valley of the Himalayas and some regions of Southeast Asia. The Rhododendron arboreum species holds the **distinction of being the state tree of Uttarakhand, the state flower of Nagaland and Himachal Pradesh** in India, and the national flower of Nepal.

Rhododendron flowers

- Rhododendron flowers are either scented or not, and typically **tubular or funnel-shaped**, displaying an array of colours such as white, pink, and red, blooming from February to April.
- The flowers of this plant are **traditionally used to make a variety of delicious products** such as **pickles, juice, jams, syrups, honey, and squash**, and are even offered to deities during religious ceremonies. The **production of Guranse, a wine** made from Rhododendron flowers, is a popular village industry in some parts of the Himalayas.

Wood Product

- The stem wood of this tree is a **valuable source of fuel**, and its durable wood is crafted into various products like **tool handles, gift boxes, and packsaddles, renowned for their usefulness and unique aroma**.
- **Rich in potassium, calcium, iron, and vitamin C**, Rhododendron products are often consumed as appetizers, traditionally known to provide relief from Mountain and seasonal sickness.
- The fruit capsules are cylindrical, curved, and longitudinally ribbed, producing ellipsoid-shaped seeds that mature from September to October.

Medicinal Benefits:

- The **phytochemicals** present in Rhododendron, such as **flavonoids, saponins, and tannins**, have been reported to imbue it with a range of medicinal properties, including **anti-inflammatory, antioxidant, anti-diabetic, and hepato protective benefits.**
- Rhododendron has been used **extensively in Ayurveda, Traditional Chinese Medicine, and Tibetan Medicine** due to its medicinal properties.

Challenges in reaping the Potential

- Most of the value addition process is **carried out without proper branding and labelling**, mainly by village-level enterprises, NGOs, and individuals. Due to **poor infrastructure and traditional processing methods**, these products do not have proper quality standards.

Solution to reap the Potential

- **Sustainable harvesting practices** are crucial for Rhododendron conservation. To achieve this, **only 60% of flowers should be harvested** from each tree, leaving the **remaining 40% to mature into seeds**. **Harvesting should be done by climbing trees** without cutting branches.
- The potential **commercial use of Rhododendron in food and pharmaceutical products should be explored**.
- **Promoting village industries** with proper branding and targeting healthoriented customers can boost the sector.

Topic 16. THE SARUS CASE

Important for subject: Environment

Under Section 39 of the Wildlife (Protection) Act, no person is allowed to acquire or keep in his possession, custody or control any wildlife which is state property. If anyone does so—for example, to treat an injured bird as in the present case — she must report it to the nearest police station or the authorized officer within forty-eight hours of obtaining such possession.

- Further,under Section 57 of the Act, if a person is found in possession, custody or control of any wildlife, the burden of proof for establishing that the possession, custody or control is not illegal is on the person.
- Clearly, WLPA does not allow anyone to take home an injured wild bird and keep it for months without written permission from the state's chief wildlife warden. But it gets a little complicated when the bird in question is a Sarus crane and the caregiver is a farmer in Uttar Pradesh.

Topic 17. ORISSA HC STAYS ALIENATION OF FOREST-CLASSIFIED LAND FOR JSW STEEL PROJECT

Important for subject: Environment

The National Green Tribunal recently suspended environmental clearances granted to the mega steel project.

- Villagers had moved the Orissa High Court, stating that the Tahsildar of Erasama **had initiated land alienation under the Orissa Government Land Settlement Act, 1962without settling their rights** under the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006.
- High Court lawyer, **had contended that Sub-section(5) in Section 4 of Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 says no Scheduled Tribe (ST) or other traditional forest dweller shall be evicted or removed from forest land under his occupation till the recognition and verification procedure is complete.**
- The petitioners submitted that between 2009 and 2013, the Odisha Government had **forcibly taken over the possession of 2,700 acres of forest land** for a mega steel plant proposed by South Korean steel major POSCO by deploying police force near the port

town of Paradip.

- Due to widespread opposition by the people, **POSCO had shelved the project in 2017.**
- Instead of returning the land to the people, the State government, through the Infrastructure Development Corporation (IDCO) had constructed boundary walls around 'illegally' acquired forest land, they pointed out. When the JSW Group proposed the **establishment of a steel plant on the same place, the same patch of land was decided to be handed over to the company**.
- The Union Ministry of Environment, Forest and Climate Change had approved the **transfer of the final forest clearance** for 1,083.69 Ha (2,677.85 acres) of forest area out of 1,253.225 Ha (3,096.78 acres**) in favour of the JSW Group.**
- A Division Bench of the Orissa HC, directed for the purpose of alienation of lands pending with the office of the Tahsildar, Erasama, **that there must first be compliance with requirements of Forest Right Act.**
- Till compliance of the requirements, including recognition of traditional forest dwellers, is complete as filed in the lease cases, they will remain stayed, said Orissa HC

18 . CARBON PRICING DASHBOARD

Important for subject: Environment

Carbon Pricing Dashboard

Carbon Pricing Dashboard is a **tool developed by the World Bank** to **track carbon pricing initiatives around the world**. The dashboard provides information on carbon pricing policies and initiatives, including **carbon taxes and emissions trading schemes,** and is **designed to help policymakers and stakeholders assess the effectiveness of different carbon pricing approaches**.

- The Carbon Pricing Dashboard is an **important tool for promoting global efforts to address climate change.** By tracking carbon pricing initiatives around the world and providing information on their effectiveness, the dashboard can **help to promote the adoption of effective and efficient carbon pricing policies**, and to support efforts to reduce greenhouse gas emissions and mitigate the impacts of climate change.
- It **builds on the data** and analyses of the **annual State and Trends of Carbon Pricing report series.** This interactive tool complements World Bank Group activities to advance well designed carbon pricing systems around the world:

- The **Partnership for Market Implementation** (PMI): PMI **assists countries to design, pilot, and implement pricing instruments aligned with their development priorities.** A 10-year program with a capitalization target of US$250 million, the Partnership brings an ambitious and long-term vision for the viability of carbon markets to its support for programs and policies — across jurisdictions and sectors — that introduce a strong price signal on carbon emissions and contribute to the Paris Agreement goal of limiting temperature rise to 1.5°C.
- The **Carbon Pricing Leadership Coalition** (CPLC): Launched in 2015, the CPLC **brings together leaders from government, business and civil society**, with the **goal of putting in place effective carbon pricing policies** that maintain competitiveness, create jobs, encourage innovation, and deliver meaningful emissions reductions.
- The **Mitigation Action Assessment Protocol** (MAAP): the MAAP is an online interface a tool that **establishes a transparent and independent framework** to help governments, project developers, investors and other relevant stakeholders to **design, assess and compare the relative risks and performance of mitigation efforts** across the globe.
- The **International Carbon Action Partnership** (ICAP) Secretariat **supports the Carbon Pricing Dashboard by providing the latest data for mandatory cap-and-trade systems**—building off the ICAP ETS Map.
- ICAP is an international forum for governments and public authorities that have implemented or are planning to implement emissions trading systems (ETS). **Founded in 2007 and now counting 40 jurisdictions** from four continents among its Members and Observers, ICAP f**acilitates the exchange of experience and best practices** among jurisdictions, with a view to improving collaboration and support in the gradual alignment and linking of domestic carbon markets.

What is carbon pricing?

- **Carbon pricing is the value ascribed to the external costs – usually social costs – of pollution emitted by an industry**
- Carbon pricing is done either through **a carbon tax** or an **emission trading system.**
- Carbon tax is the price that **governments impose on polluters for each metric ton of carbon dioxide emissions generated**.
- **Carbon trading is a market-based approach** in which each **polluter is allotted a specific quota (permit)** or allowance of pollution that it can emit and **trade these**

permits.

Why a price on carbon?

- Carbon is priced because CO2 being the most emitted GHGs. According to the latest IPCC report, the window of action for reducing emissions to limit global warming to 1.5 – 2 deg C above pre industrial level is rapidly closing.
- And global warming & climate change create conditions beyond human tolerance
- **Currently, Carbon pricing is done in two ways: (1) carbon tax, (2) Cap-and trading or emission trading system (ETS)**

What is Carbon tax?

- Governments impose on polluters for each metric ton of CO2 emissions (mt CO2e) generated Levied on coal, oil products, and natural gases, according to their carbon content. It motivates industries to improve energy efficiencies, move towards low-carbon fuels and renewable energy sources.
- Carbon taxes are fairly easy to administer as add-ons to already existent fuel taxes Generate revenue for governments that can be utilised for achieving sustainable development goals.
- However, Carbon tax affects people of lower income groups as it increases fuel prices, and carbon taxes on industries trickle down to consumers
- In addition, carbon taxes may discourage investment and economic growth as businesses may shift production into countries without carbon taxes
- Finally, the administrative costs of monitoring and measuring emissions, and uncertainties in measuring the social costs of carbon pollution can make carbon taxation a difficult task.

What is carbon trading?

- **Market-based approach to pricing carbon emissions** and to limit the total amount of carbon-based pollution that can be produced.
- Governments **allocate a limited number (set as a cap) of permits** that allow a specified amount of emissions over a period of time.
- Polluters are then **allowed to trade these permits with each other.** if a polluter manages to maintains emission levels lower than its assigned permit values, it can sell the right to

emit carbon to another polluter which may be emitting more that its quota

What are carbon credits?

- A carbon credit is a generic term for a tradeable certificate or permit to emit a 1 metric tonCO2 or an equivalent amount of different GHGs. It is the basic trading unit for carbon markets.
- The carbon trading market **was set up in 1997, after the Kyoto Protocol was signed.** Under this protocol, all participating countries were to set and adhere to a limit on their carbon emissions over a series of commitment periods.
- However, the protocol also allowed countries to trade emissions permits with each other.
- Apart from these permits, carbon removal units (from activities such as reforestation), emission reduction units, and certified emission reductions (from clean development mechanism projects) can also be traded
- The prices in cap-and-trade schemes, which use carbon credits, are market driven (meaning that their prices vary according to demand and supply), although the government controls how many units/credits are allotted to each industry/stakeholder, and so how many credits are available for sale on the whole.

Topic 19. GREEN CORRIDORS

Important for subject: Environment

If Green Corridors succeed, in 2030 zero-emission shipping will be a commercially viable option anywhere.

Green Corridors for Shipping:

- Green corridors for shipping involves the **creation of shipping routes that are environmentally sustainable and optimized for low-carbon shipping.**
- The idea behind green corridors **is to facilitate the movement of goods and people while minimizing the environmental impact** of shipping activities.
- Green corridors for shipping typically **involve a range of measures**, including the **use of clean energy sources,** such as wind, solar, and hydrogen, the **optimization of shipping routes** to minimize fuel consumption and emissions, the **use of eco-friendly ship designs and technologies**, and the **adoption of sustainable shipping practices**.
- The idea of Green Corridors **took root in the public consciousness at COP26 in**

Glasgow, with the **signing of the Clydebank Declaration** by governments and the publication of the report The Next Wave: Green Corridors, which described the concept in detail.

- Since then several initiatives and projects are underway around the world to develop green corridors for shipping. These include the **'Motorways of the Sea'** project in Europe, which **aims to create a network of sustainable shipping routes**, the **'Green Corridor Joint Industry Project' in Asia**, which focuses on the development of low-emission shipping technologies and practices, and the **'Zero Emission Vessels 2030' project in Norway, w**hich aims to develop and demonstrate zero-emission shipping technologies.

Importance of Green Corridors for Shipping

- **Reducing greenhouse gas emissions:** The **shipping industry** is a significant contributor to greenhouse gas emissions, **accounting for around 2-3% of global emissions**. Green corridors for shipping can help reduce these emissions by **promoting the use of low-carbon shipping technologies**, such as hybrid and electric vessels, and optimizing shipping routes to reduce fuel consumption.
- **Improving air quality:** Shipping activities can also have negative impacts on local air quality, **particularly in port cities**. Green corridors for shipping can help reduce these impacts by promoting the use of low-emission technologies, such as shore power, and encouraging the adoption of sustainable shipping practices.
- Supporting sustainable development: The development of green corridors for shipping can also support sustainable development goals **by promoting the use of renewable energy sources, reducing dependence on fossil fuels, and promoting sustainable transport systems.**
- **Meeting climate targets**: The development of green corridors for shipping is also essential for meeting global climate targets, such as those outlined in the Paris Agreement.

Green Corridors at COP27

- Among other discussions, the **24 governments that have signed the Clydebank Declaration** are marking its one-year anniversary by **taking stock of progress so far**, in part by discussing the Annual Progress Report on Green Shipping Corridors that the Global Maritime Forum and Getting to Zero Coalition are publishing.
- The **Zero-Emission Shipping Mission** have **also launched a Green Corridors Hub**,

with a set of **useful tools for governments and companies** who are interested in the topic. One of the most interesting is **public-domain data set and evaluation method** developed by University Maritime Advisory Services for the Getting to Zero Coalition. It's **introducing a new approach to deciding which routes are best suited to become Green Corridors.**

Clydebank Declaration:

- The Clydebank Declaration **aims to set up green shipping corridors**, which are zero-emission maritime routes between 2 (or more) ports.

Launched at COP26 by UK.

- As part of the declaration, the signatory countries will support the establishment of at least six green shipping corridors by 2050. **India has not signed the declaration yet.**
- In the pursuit of these goals signatories have pledged to: **facilitate the establishment of partnerships**, with participation from ports, operators and others along the value chain, to **accelerate the decarbonization of the shipping sector** and its fuel supply through green shipping corridor projects; **identify and explore actions to address barriers to the formation of green corridors.** This could cover, for example, regulatory frameworks, incentives, information sharing or infrastructure; **consider the inclusion of provisions for green corridors in the development or review of National Action Plans**; **work to ensure that wider consideration is taken for environmental impacts and sustainability** when pursuing green shipping corridors.

Topic 20. ORPHANED TIGER CUBS SHIFTED TO PENCH RESERVE FOR "REWILDING"

Important for subject: Environment

Two orphaned tiger cubs rescued from the Pandharkawada forest range in Maharashtra's Yavatmal district have been moved to Pench Tiger Reserve for "rewilding".

Pench Tiger Reserve (PTR), Maharashtra, has launched the **rewilding experiment** of two orphaned tiger cubs at Titralmangi in a bigger enclosure in the reserve.

- The two eight-month-old cubs, one male and one female, of tigress PKT-7, were **rescued**

on March 14, 2023, from Mandwa in the **Ghatanji forest range adjoining Tipeshwar** wildlife sanctuary near Pandharkawda.

- The **tigress died under mysterious circumstances** on January 28.Belatedly, the **two cubs were shifted to a bigger enclosure in Pench** on Wednesday after a gap of 15 days.
- Rewilding process will be carried as per the NTCA SOPs and all precautions will be taken.
- In December 2018, PKT-1 aka **Avni's one-year-old cub was rescued** from Pandharkawda and **shifted to Pench** where it was trained for two years. On March 5, 2021, the **three-year-old Avni's offspring PTRF84 was released in the wild** in Pench itself. However, three days after its release it was **attacked by another tiger** in which the feline suffered serious injuries and died four days later.
- Prior to this experiment, in **June 2015, a tigress TF2 that was rewilded** in the Pench enclosure was captured after 24 days post its release. The villagers from Khapa threatened to attack the tigress after it came close to the village.

Rewilding of Wild animals:

- Rewilding is a **conservation approach** that involves **reintroducing or restoring wild animals** and their habitats to areas where they have been previously extirpated or degraded.
- As per the Standard Operating Procedures/Guidelines laid down by the **National Tiger Conservation Authority (NTCA)** under Section 38(O) of The Wildlife
- Protection Act, 1972, there are three ways to deal with orphaned or abandoned tiger cubs. The first is to make an effort **to reunite the abandoned cubs with their mother**.
- Second, if a reunion of the cub with its mother is not possible, then **shift the cub to a suitable zoo.**
- Third, reintroduction of the cub into the wild **after a certain time** when it appears that the **cub is capable of surviving in the wild independently**.
- This is what is known as're-wilding'.
- NTCA stresses that the **tiger cub should be reared in an in situ enclosure** for a **minimum of two years**, and during this time, each cub should have a successful record of at least 50 'kills'.

Pench Tiger Reserve:

- Pench Tiger Reserve or Pench National Park is one of the premier tiger reserves of India and the first one to **straddle across two states – Madhya Pradesh and Maharashtra**.
- The portion of the reserve that is in Madhya Pradesh is **nestled in the southern slopes of the Satpura range of Central India.** Pench Tiger Reserve was the **inspiration behind Rudyard Kipling's famous novel, "The Jungle Book".** The area was declared a wildlife sanctuary in 1977, and later a national park and tiger reserve in 1983 and 1992 respectively.
- The vegetation in the Pench Tiger Reserve is predominantly **southern tropical dry deciduous forest**. It is home to a variety of tree species, such **as teak, sal, saja, achar, and dhawada**. There are **also bamboo forests** and grasslands in the reserve.
- **River pench flows into reserve cutting** it into two from North to South before going on to join the Kanhan River, The Pench River which emerges from Mahadeo Hills of Satpura Ranges.
- Apart from tigers and Indian bison, the Pench Tiger Reserve is **also home to other large carnivores such as leopards, wild dogs, and hyenas.** Other wildlife species found in the reserve include jackals, foxes, sloth bears, sambar deer, chital, and wild boars. The reserve is also a birdwatcher's paradise with over 285 species of birds.

Topic 21. MORE THAN 90% OF THE WORLD'S SALT MARSHES MAY SOON SUCCUMB TO SEA LEVEL RISE

Important for subject : Environment

Salt marshes have been playing an outsized role in stabilising the environment.

But more than 90 per cent of these biologically productive ecosystems may soon succumb to sea level rise by the turn of the century, according to a new research. Scientists from the Marine Biological Laboratory (MBL) have been tracking vegetative cover in Great Sippewissett Marsh in Falmouth, Massachusetts, for the last 50 years to **analyse the implications of higher nitrogen levels on marsh grass species**.

- **Increased nitrogen favoured higher levels of vegetation** and accretion of the marsh surface. **However, these ecosystems won't be able to outpace submergence** from global sea level rise, noted the study.

- The only choice for salt marshes then **would be to migrate landward.** But even this **choice can be impacted by anthropogenic activities** and other factors.
- Marshes all over the globe experience **'coastal squeeze**,' where their movement is obstructed by sea level rise, anthropogenic activities and geographical factors. For instance, a **seawall that protects a home from inundation will prevent a wetland from naturally migrating to higher ground**.
- These barriers, whether they be geographic like a hill or a cliff, or people building along the edges of the ecosystem, constrain the potential for landward marsh migration.

Salt marshes

- Salt marshes are **coastal wetlands that are flooded and drained by salt water** brought in by the tides. They are marshy because the **soil may be composed of deep mud and peat**.
- Because salt marshes are frequently submerged by the tides and contain a lot of **decomposing plant material, oxygen levels in the peat can be extremely low— a condition called hypoxia.** Hypoxia is caused by the growth of bacteria which produce the sulfurous rotten-egg smell that is often associated with marshes and mud flats.
- Salt marshes occur worldwide, particularly in **middle to high latitudes**. Thriving along protected shorelines, they are a common habitat in estuaries.
- These **intertidal habitats** are essential for healthy fisheries, coastlines, and communities—and they are an integral part of our economy and culture.

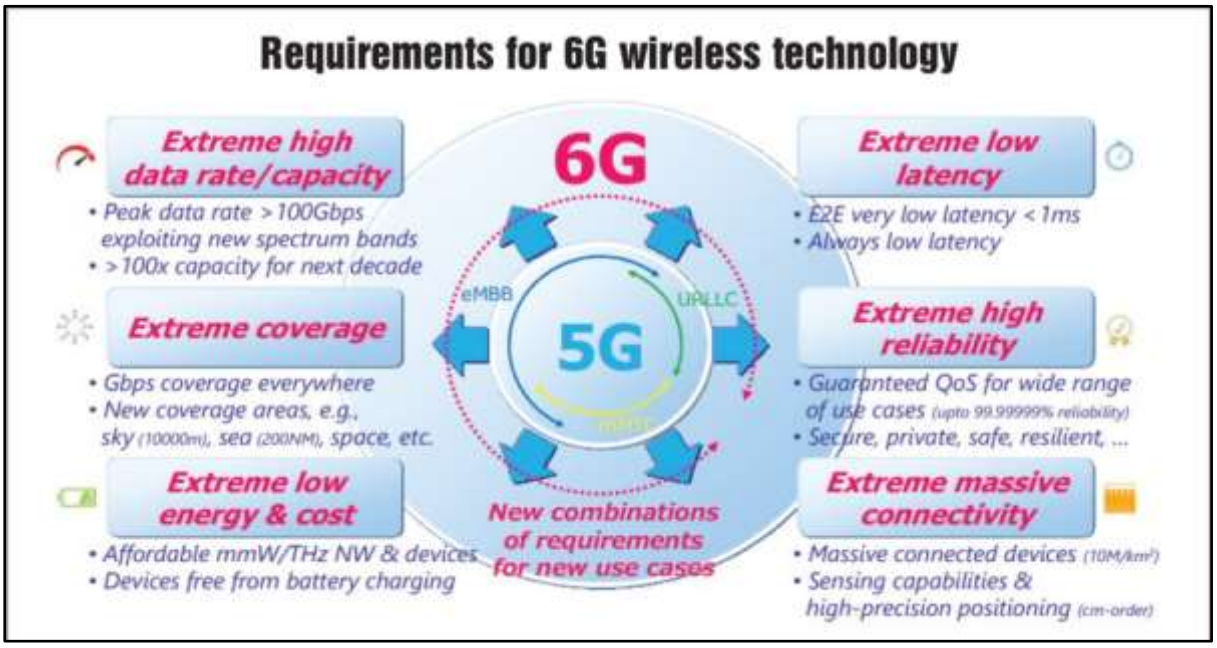
Ecological Function of Salt Marshes

- **Habitat**: Salt marshes provide important habitat for a variety of fish and wildlife species. They serve as nurseries for commercially **important fish and shellfish species, as well as a variety of birds, reptiles, and mammals**.
- **Nutrient cycling**: Salt marshes are highly productive ecosystems that play an important role in nutrient cycling. They **absorb excess nutrients** from the water, such as nitrogen and phosphorus, and convert them into organic matter, which can be used by other organisms.
- **Water quality:** Salt marshes are **natural filters that help improve water quality**. They absorb pollutants and excess nutrients from the water, which can help reduce the risk of harmful algal blooms and other water quality problems.

- **Carbon storage:** Salt marshes are **important carbon sinks** that store large amounts of carbon in their soils and plant biomass. This can **help mitigate climate change** by reducing the amount of carbon dioxide in the atmosphere.
- **Coastal protection:** Salt marshes serve as **natural buffers against storms** and floods. They help reduce the impact of waves and storm surge, which can help prevent erosion and protect coastal communities.
- **Threats:** Salt marshes are under threat from a variety of human activities, including **coastal development, dredging, and pollution**. **Climate change** is also a major threat to salt marshes, as rising sea levels and increased storm activity can lead to **erosion and inundation of the marsh.**

Topic 22. 6G TECHNOLOGY

Important for subject: Science and technology



Minister Ashwini Vaishnaw has said that India registered 127 patents for 6G Technology.

About 6G Technology

- G (sixth-generation wireless) is the **successor to 5G cellular technology**. 6G networks will be able to **use higher frequencies than 5G networks and provide substantially higher capacity and much lower latency.**
- One of the goals of 6G internet will be to support one microsecond-latency

communication. This is 1,000 times faster — or 1/1000th the latency — than one millisecond throughput.

- **Working in conjunction with artificial intelligence** (AI), the computational infrastructure of 6G will autonomously determine the best location for computing to occur; this includes decisions about data storage, processing and sharing.
- 6G is expected to **support data rates of 1 terabyte per second**. It seeks to utilize the **terahertz band of frequency** which is **currently unutilized.** Terahertz waves **fall between infrared waves and microwaves** on the electromagnetic spectrum.
- These waves are **extremely tiny and fragile, but there's a huge amount of free spectrum up there** that would allow for spectacular data rates.

India's 6G Roadmap

- The Bharat 6G project will be **implemented in two phases** and the government has also appointed an apex council to oversee the project and focus on issues such as Standardisation,
- Identification of the spectrum for 6G usage, Create an ecosystem for devices and systems, and Figure out finances for research and development, etc.
- In **phase one (from 2023 to 2025), s**upport will be provided to explorative ideas, risky pathways and proof-of-concept tests.
- Ideas and concepts that show promise and potential for acceptance by the global peer community will be adequately supported to develop them to completion, leading to commercialisation as part of **phase two (from 2025 to 2030**).
- To fund research and innovation on 6G, the document recommended the creation of a corpus of Rs 10,000 crore to facilitate various funding instruments such as grants, loans, VC fund, etc.
- To decide on standardisation around 6G and related technologies, the document called for India to take on a greater role in various international bodies such as 3GPP, ITU, IEC, and IEEE.

Topic 23. CHANDRAYAAN 3 MISSION TO BE LAUNCHED IN MID-2023: ISRO CHIEF

Important for subject: Science and technology

Indian Space Research Organization (ISRO) Chairman S. Somanath announced that the launch **of Chandrayaan-3 and the Aditya L1 will likely take place by the middle of 2023**at the **inagural talks of 4th Indian planetary conference.**

Chandrayaan-3 is India's third lunar mission and Aditya L1 is India's first-ever solar mission. ISRO is also discussing a **possible mission to the moon with the Japan Aerospace Exploration Agency (JAXA).** ISRO Chairman also **confirmed that there is a good opportunity to launch a mission to explore Venus by 2028.**

4th Indian planetary conference

- The **Indian Planetary Science Association (IPSA**) is hosting the 4th Indian Planetary Science Conference (IPSC-2023) at the **Physical Research Laboratory in Ahmedabad**.

It is a three-day conference scheduled for March 22-24, 2023.

- In the context of upcoming planetary missions to the Moon, Mars, Venus, and other planetary bodies that will be launched by the Indian Space Research Organisation (ISRO), DOS, IPSA was established to promote planetary science activities in India with an important task to create a much-needed planetary science community in India.
- With the participation of all stakeholders, IPSA will encourage Indian scientists and academies to develop a long-term vision.
- The primary goal of IPSC is to provide a **single platform for planetary researchers to present and discuss their research accomplishment**s and thus drive India's planetary exploration.
- **The IPSC-2023 conference will discuss the Indian planetary missions that have already been launche**d, and the **science that has been derived from them**, and **provide a framework for future Indian missions** and related challenges in instrument development and exploration.

Topic 24. INDIA REJECTS J&J'S ATTEMPT TO EXTEND PATENT ON TB DRUG

Important for subject: Science and technology

The Indian Patent Office rejected S. pharmaceutical giant **Johnson & Johnson's (J&J) attempt to extend its monopoly on the manufacturing of the antituberculosis drug Bedaquiline in India beyond July 2023**.

This **will pave the way for generic drug manufacturers** (Lupin and Macleods) to **produce Bedaquiline tablets**, **thus ensuring cheaper** (currently priced at $400 per six-month course) and **wider access** to the drug.

- **Indian Patent Office Decision Bedaquiline is a crucial drug in the treatment of multi-drug resistant TB patients** for whom the first-line drug treatment (using Isoniazid, Rifampicin, Pyrazinamide and Ethambutol) has stopped working.
- According to the latest estimates, over 55,000 patients who had developed multidrug resistant TB could have benefited from access to Bedaquiline in 2019.
- Therefore, it is high time that alternate manufacturers start supplying Bedaquiline at lower prices, especially as TB programmes around the world plan to scale-up the all-oral, shorter, six-month drug-resistant TB regimen.
- **Since 2007, J&J has indulged in 'evergreening' by making multiple claims in its applications for patent extensions.**
- When the company filed for evergreening of its patent on fumarate salt (a formulation of Bedaquiline), the practice was challenged by two TB survivors in 2019.
- The **Indian Patent Office, in the order passed**, stated that the **invention claimed was obvious and does not involve any inventive step** (under **Section 3(e) of the Patents Act), and is therefore non-patentable. Section 3(d) of the Patents Act states that salt forms and derivatives** of known substances are **not patentable.**
- Hence, the applicant cannot claim a patent on these methods and compositions of salt forms that have been known in the scientific world for more than three decades.
- However**, J&J will continue to hold the patent on Bedaquiline in other major markets such as South Africa,** meaning that **Indian generic manufacturers will be unable to export the drug there.**

Ever greening of Patents

- The ever greening of patents is a practice of tweaking drugs in order to extend their patent term and thus their profitability.
- The **Indian Patents Act 1970** introduced **many provisions [Sections 3(d), 53(4) and 107A]** to **prevent** the mischievous practice of **"evergreening" of patents**.
- This is to aid millions of people who can't afford the expensive modified drugs, as well as the development of the domestic generic drug market.
- However, evergreening patents on drugs (diabetes, cancers, cardiovascular diseases, etc) continue to be granted to pharmaceutical innovator companies by the Indian Patent Office and enforced through courts.

Why is Patent Monopoly/Evergreening Granted?

- The economic assumption behind the Patent Bargain (private risk is rewarded and incentivised in return for a limited private monopoly right) is to have a trickle-down impact that benefits the general population.
- Therefore, **patent monopolies are granted to innovators** in the hope **that they disclose something new, inventive and of industrial value to the public.**
- However, the Patent Bargain becomes a Faustian bargain (in which a person abandons his or her moral principles to obtain benefits), Undermining competition in the market and Enables patentees to extract more from the society than permitted.

Supreme Court's Verdict in this Regard

- In Novartis AG v. Union of India & Others (2013), the apex court held that the legislative intent is to prevent evergreening of a patent monopoly that in no way enhances the drug's therapeutic efficacy.
- However, the SC's verdict has not yielded any positive outcomes both from the Patent Office and subordinate courts, rather it delayed entry of generic versions, adversely affecting the availability of affordable medicines.

Topic 25. INDIA'S PUSH FOR SEMICONDUCTORS

Important for subject: Science and technology

As part of its efforts to encourage the electronics supply chain to India, **the Union Government has disbursed close to ₹1,645 crores through performance linked**

incentives (PLI) for **electronics manufacturers.**

There is a growing need for semiconductors as they are used in almost all modern electronics. Many countries are moving away from China's dominance in the sector due to supply chain vulnerabilities and geopolitical pressures.

Semiconductor manufacturing

- Semiconductor fabrication units or fabs are **manufacturing plants that help turn raw materials such as silicon into integrated circuits** which are a **part of almost all electronic hardware.**
- Semiconductor fabrication units or fabs are **highly capital-intensive undertakings** and **require billions of dollars in the case of large facilities.**
- Fabs also require a highly reliable and high-quality supply of water, electricity, and insulation from the elements and a high degree of precision, cost and capital are required to make the sophisticated circuits.
- Countries across the world have now realised strategic value associated with the segments of the value chain for fabs.
- As per a report by the Semiconductor Industry Association (SIA), **in 2022 China surpassed Taiwan in terms of share of global sales from fabs.**
- The U**.S. enacted the CHIPS Act in August 2022,** which extends about $280 billion in subsidies and investments to encourage manufacturers to set up fabs and make semiconductors in the U.S.
- The government's **Invest India agency** says that **electronics manufacturing as a whole sector would be worth $300 billion by FY 25–26.**
- Further, facilities for assembling finished products have been steadily increasing in number in India.
- However, the number of fabs for making chipsets and displays, which are essential parts of the manufacturing process for electronic devices in the country, is a cause of concern.
- According to the Minister of Electronics and Information Technology, the first semiconductor manufacturing fab will be announced in the coming future.

Opportunities for India

- The Semiconductor Industry Association (SIA) has said that India must rely on its

strengths in the electronics manufacturing value chain.

- A significant portion of semiconductor manufacturing involves design and intellectual labour. India is said to have an advantage as a large share of semiconductor design engineers working across the world are either Indians or of Indian origin.
- Further, top chipmaking firms like Intel and NVIDIA have already established large facilities in India and have provided the required exposure to Indian talent.
- Experts feel that China is losing control over such an advantage on account of sanctions and an ageing population.

India Semiconductor Mission

- The ISM was **launched in 2021** with a **total financial outlay of Rs76, 000 crore** under the aegis of the **Ministry of Electronics and IT (Meit Y**).
- It is part of the comprehensive program for the development of sustainable semiconductor and display ecosystem in the country.
- The program aims to provide financial support to companies investing in semiconductors, display manufacturing and design ecosystem.
- Envisioned to be led by global experts in the Semiconductor and Display industry, **ISM will serve as the nodal agency for efficient, coherent and smooth implementation of the schemes.**

Components:

Scheme for setting up of Semiconductor Fabs in India:

- It provides fiscal support to eligible applicants for setting up of Semiconductor Fabs which is aimed at attracting large investments for setting up semiconductor wafer fabrication facilities in the country.
- The Scheme **extends a fiscal support of 50% of the project cost** on *pari-passu* basis for setting up of Silicon CMOS based Semiconductor Fab in India.

Scheme for setting up of Display Fabs in India:

- It provides fiscal support to eligible applicants for setting up of Display Fabs which is aimed at attracting large investments for setting up TFT LCD / AMOLED based display fabrication facilities in the country.

- Scheme **extends fiscal support of 50% of Project Cost** on *pari-passu* basis for setting up of Display Fabs in India.
- **Scheme for setting up of Compound Semiconductors / Silicon Photonics / Sensors Fab and Semiconductor Assembly, Testing, Marking and Packaging (ATMP) / OSAT facilities in India:**
- The Scheme provides a **fiscal support of 30% of the Capital Expenditure to the eligible applicants** for setting up of Compound Semiconductors / Silicon Photonics (SiPh) / Sensors (including MEMS) Fab and Semiconductor ATMP / OSAT(Outsourced Semiconductor Assembly and Test) facilities in India.

Design Linked Incentive (DLI) Scheme:

- It offers financial incentives, design infrastructure support across various stages of development and deployment of semiconductor design for Integrated Circuits (ICs), Chipsets, System on Chips (SoCs), Systems & IP Cores and semiconductor linked design.
- The scheme provides "**Product Design Linked Incentive" of up to 50% of the eligible expenditure Important for subject to a ceiling of ₹15 Crore per application** and **"Deployment Linked Incentive" of 6% to 4% of net sales turnover over 5 years Important for subject to a ceiling of ₹30 Crore per application.**

Topic 26. THE ROAD TO ENDING TUBERCULOSIS

Important for subject: Science and technology

The existing target of **ending tuberculosis (TB) by 2030 lacks implementation** and clarity about definitions of "end".

Tuberculosis (TB)

- Tuberculosis (TB) is an infectious disease caused by Mycobacterium tuberculosis.
- TB commonly affects the lungs (pulmonary TB) but can also affect other parts (extra pulmonary TB)
- Tuberculosis spreads from person to person through the air, when people who are infected with TB infection cough, sneeze or otherwise transmit respiratory fluids through the air.
- The most common risk factor associated with TB is HIV & other conditions that impair the immune system.

- Common symptoms of tuberculosis are Chronic cough with blood-tinged sputum, Loss of weight, Loss of appetite, Fever and night sweats, Fatigue, etc.

TB Treatment: consists of four drugs:

1. Isoniazid (INH)
2. Rifampicin
3. Pyrazinamide
4. Ethambutol

Multidrug-Resistant TB (MDR-TB)

- In MDR-TB, the bacteria that cause TB develop resistance to antimicrobial drugs used to cure the disease.
- MDR-TB does not respond to at least isoniazid and rifampicin, the 2 most powerful anti-TB drugs.
- Treatment options for MDR-TB are limited and expensive. CBNAAT (Cartridges Based Nucleic Acid Amplification Test) is used for early diagnosis of MDR-TB.

Extensively Drug-Resistant TB (XDR-TB)

- XDR-TB is a form of multidrug-resistant TB with additional resistance to more anti TB drugs.
- People who are resistant to isoniazid and rifampicin, plus any fluoroquinolone and at least one of three injectable second-line drugs (amikacin, kanamycin, capreomycin) are said to have XDR-TB.
- To achieve goal: To end TB by 2025

Background:

- In **1993, the World Health Organisation (WHO) declared TB a global health emergency.**
- Founded in 2001, the **Stop TB Partnership** (a UN-hosted organisation) takes bold and smart risks to serve the needs and amplify the voices of the people, communities, and countries affected by TB.
- The **Stop TB board meets in Varanasi, India, and will coincide with World TB Day 2023 (March 24).** The **Global Fund to Fight AIDS, TB and Malaria (2002) began**

disbursing money directed towards the global TB epidemic in 2003. However,the response has been short on urgency and long on processes.

- For example, The Global Fund remains hostage to the zero-sum games imposed by donors and the champions of the three diseases.

Key areas that remain under-served:

- **Development and wide use of an adult TB vaccine**: The current vaccine is delivered at birth.

Getting newer therapeutic agents for TB.

- Moving to an injection-free and shorter all-oral pills regimen for TB (the current standard is for at least six months) will improve compliance and reduce patient fatigue.

The space of diagnostics:

- There are exciting developments for use of AI-assisted handheld radiology with 90-second reporting and 95% plus accuracy for diagnosing TB.
- This is a mature technology and should be rolled out universally immediately.

Best practices in India:

- The COVID-19 vaccine development process shows what can be done with the help of collective will and action. India convened the InDx diagnostics coalition in Bengaluru for COVID-19. TN-KET (Tamil Nadu KasanoiErappilaThittam/TB death-free project)

Measures taken by India to eradicate TB

- The **National Tuberculosis Elimination Programme(NTEP) –** Aims to strategically reduce TB burden in India by 2025.
- It was previously known as Revised National Tuberculosis Control Programme (RNTCP). The government reached over a billion people in 632 districts/reporting units.
- The **National Strategic Plan for TB Elimination** – It was launched to achieve the target of **ending TB by 2025 in a mission mode.**
- It is a multi-pronged approach which aims to detect all TB patients with an emphasis on reaching TB patients seeking care from private providers and undiagnosed TB in high-risk populations

- **Ni-kshay Poshan Yojana(NPY)(Nutritional Support to TB**) – It helps to meet the nutritional requirements of TB patients, especially the underserved From 2018 till present, around Rs. 1,707 crore has been disbursed to more than 65 lakh people on TB treatment across the country
- **Patient Provider Support Agencies (PPSA**) – To engage the private sector, Patient Provider Support Agencies (PPSA) have been rolled out across 250 districts through the domestic setup and JEET initiative
- **Universal Drug Susceptibility Testing (UDST**) – To ensure every diagnosed TB patient is tested to rule out drug resistance before or at the time of treatment initiation itself.
- **Pradhan Mantri TB Mukt Bharat Abhiyaan** – To bring together all community stakeholders to support those on TB treatment and accelerate the country's progress towards TB elimination.
- **Ayushman Bharat** – Health and Wellness Centres – To decentralize comprehensive primary healthcare including TB care services at the grassroots level.
- Bedaquiline and Delamanid -Newer drugs like Bedaquiline and Delamanid have also been made available for management of DRTB.

What are the global measures to eradicate TB?

End TB Strategy – by World Health Organization (WHO)

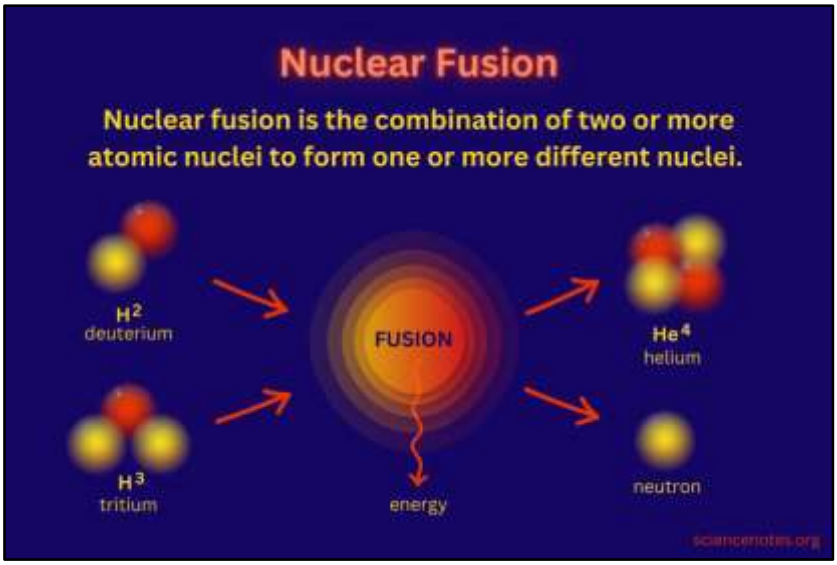
- It serves as a blueprint for countries to reduce TB incidence by 80%, TB deaths by 90%, and to eliminate catastrophic costs for TB-affected households by 2030.

World Development Report (1993) – Published by the **World Health Organization (WHO).**

- The 1993 World Development Report labelled TB treatment for adults as the best buy among all developmental interventions.
- **The Global Fund** – A worldwide movement to defeat HIV, TB and malaria and ensure a healthier, safer, more equitable future for all.
- **The Stop TB Partnership** – Brings together expertise from a broad spectrum of country, regional, and global partners in our shared mission to revolutionize the TB space and end TB by 2030. **Sustainable Development Goal 3 – To end TB epidemic by 2030**

Topic 27. NUCLEAR FUSION

Important for subject : Science and Technology



Three major developments are behind this optimism about nuclear fusion

What is a fusion reaction

- In a **fusion reaction,** two light nuclei merge to form a single heavier nucleus. The process **releases energy** because the total mass of the resulting single nucleus is less than the mass of the two original nuclei.
- Fusion is a different but more powerful way of harnessing the immense energy trapped in the nucleus of an atom. The nuclear fusion reaction occurs in the sun and other stars, which makes it able to shine and radiate energy.

Nuclear fission process-

- In this process, the nucleus of a heavier element is split into those of lighter elements in a controlled manner.
- Currently, the nuclear energy in use across the world comes from the **fission process.**

Energy from nuclear fusion reaction

- A large amount of energy is released in both these processes, but substantially more in fusion than fission reaction.
- 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.

- Attempts to master this process begins in the **1950s,** but it is incredibly difficult and is still at an experimental stage.
- Besides greater energy yield, fusion is also a **carbon-free source of energy** and has **negligible radiation risks.**
- **Challenges in harnessing energy from fusion reaction**These 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.

What the U.S scientists have achieved

- So, far, the energy released in such experimental fusion reaction has been lower than what is consumed to create the enabling high temperatures.
- At best, some of these reactions have produced **'near-break-even'** energies. But in the latest experiment conducted at the **Lawrence Livermore National Laboratory** in **California**, the scientist has **gained the net positive energy** i.e. produced more energy from fission reaction than what is consumed to produce that energy.
- Scientists use **high-energy laser beams** to achieve those temperatures, also called **'inertial fusion'.** But producing it on a commercial scale is still two to three decades away.

Previous achievements

- In december last year, **UK-based JET laboratory,** which uses **magnetic fusion**, had improved its previous record for the amount of energy produced from a fusion reaction.
- The reaction had run for five seconds and produced 59 megajoules of energy, more than double the previous record.

Experiments in other countries-

- The International **Thermonuclear Experimental Reactor (ITER) project** is going on in **southern France,** in which **France, India** and **USA** are partners. They are using very strong magnetic fields to enable very high temperatures.
- India joined the ITER project in The **Institute for Plasma Research in Ahmedabad**, a laboratory under the **Department of Atomic energy,** is the lead institution from the

Indian side participating in the project.

- As a member country, **India** is building several components of the ITER reactor, while also carrying out a number of experiments and R&D activities related to the project.
- ITER, when operational, would become the **biggest machine anywhere in the world,** more complex than the Large Hadron Collider at CERN or the LIGO project to detect gravitational waves.
- Several countries like **China, Japan, South Korea** and **the UK** are working on this technology separately.

Joint European Torus and Tokamak

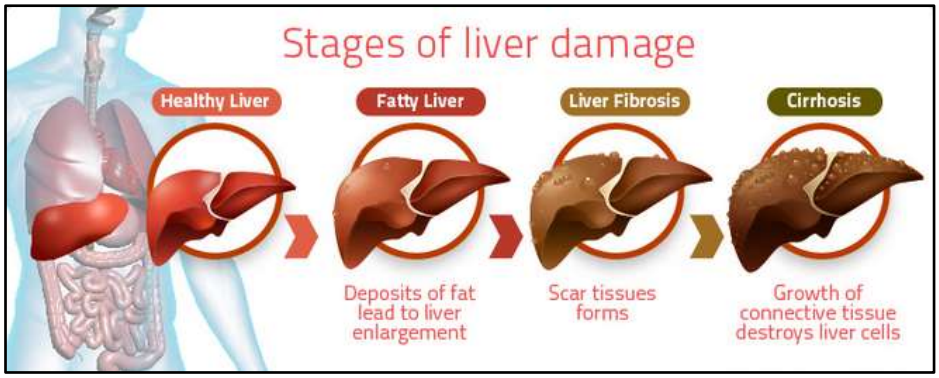
- The **Joint European Torus (JET – pictured),** located at **Culham Centre for Fusion Energy,** is the largest and most powerful tokamak experiment currently operating. MAST Upgrade, also located at Culham, is a more compact and efficient type of device known as a 'spherical tokamak'.
- The tokamak uses powerful external magnetic fields to confine and control the hot plasma of fusion fuels in a ring-shaped container called **a 'torus'.**
- It was **first developed in the Soviet Union** in the 1960s and was soon adopted by researchers around the world due to its enhanced performance compared with other approaches.

US National Ignition Facility

- The **'breakthrough'** announced by the **US National Ignition Facility** has focused the spotlight on nuclear fusion. NIF reported a **net energy gain** (more output than input), which is deduced to have come from **two nuclei of hydrogen atoms fusing to form a helium nucleus.**
- **Commonwealth Fusion Systems (CFS)** is building the **world's first fusion device** that **produces plasmas** which **generate more energy than they consume,** becoming the world's first net-energy fusion machine. The device, named **SPARC,** is for demonstration but a commercial plant is expected to follow.
- Headquartered in **Cambridge, Massachusetts, USA**, Commonwealth Fusion Systems (CFS) was set up in **2018. CFS** aims to build the demonstration plant, **SPARC, by 2025** and the commercial plant by **2030**.

Topic 28. FATTY LIVER DISEASE

Important for subject : Science and technology



A high-quality study showed that **inadequate sleep duration was strongly associated with an elevated risk of developing non-alcoholic fatty liver disease, and adequate sleep helped prevent it.** Several experiments on lab mice and rats have shown the impact of inadequate sleep which increased Liver enzymes, blood, and liver fat.

- Sleep deprivation stresses liver cells and the activity of certain genes that escalate insulin resistance and fat content within liver cells also increased with sleep deprivation. The sympathetic nerves that supplied the liver, best known for their role in responding to stress and danger, were hyperactive in sleep deprived people.
- With every one-hour decrease in sleep time from the recommended seven-eight hours, the risk of fat deposition in the liver increased by 24% compared with those who slept adequately.

Importance of sleep:

- Sleep is a vital function of human life and accounts for up to one-third of the lifespan. Contrary to normal belief, during sleep, the brain is not ‘resting’ but is engaged in various activities necessary to improve well-being, increase life, and especially impact the liver.
- A study of nearly 55,500 people from Europe showed that those who slept 7-8.5 hours daily had higher life expectancy than those who slept less than seven hours.
- In those between ages 50 and 75 without sleep disturbances, the expectation of living longer without chronic disease development was significantly higher.

Non-alcoholic fatty liver disease:

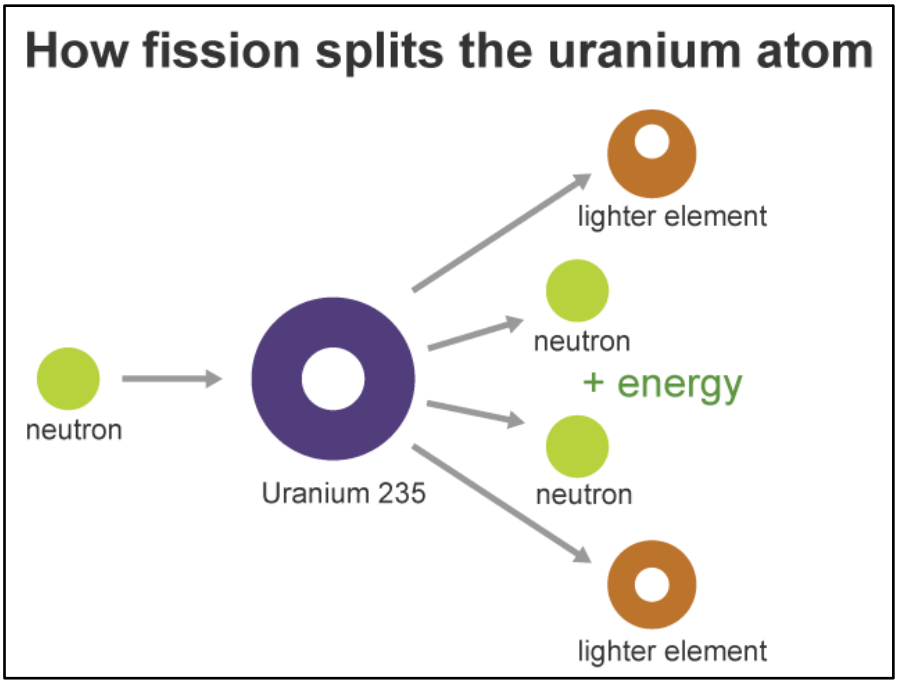
- Nonalcoholic fatty liver disease (NAFLD) is an **umbrella term for a range of liver conditions affecting people who drink little to no alcohol.**

The main characteristic of NAFLD is **too much fat stored in liver cells.**

- Early-stage NAFLD does not usually cause any harm, however, **individuals with NAFLD can develop nonalcoholic steatohepatitis (NASH), an aggressive form of fatty liver disease, which is marked by liver inflammation and may progress to advanced scarring (cirrhosis) and liver failure.**
- This damage is **similar to the damage caused by heavy alcohol use**. Having high levels of fat in the liver is also associated with an increased risk of serious health problems, such as diabetes, high blood pressure and kidney disease.
- Increase in NAFLD in diabetic patients will heighten the chances of developing heart problems.
- If detected and managed at an early stage, it's possible to stop NAFLD getting worse and reduce the amount of fat in the liver.

Topic 29. ORIGIN OF NUCLEAR FUEL

Important for subject: Science and technology



Scientists in China have developed a **technique to reliably identify whether some nuclear fuel originated in one of two common kinds of nuclear reactors using experimental data**

and machine-learning (ML).

- The reactor type, the fuel's exposure time inside the reactor, and the extent of the fuel's enrichment can uniquely identify spent nuclear fuel.

Nuclear fuel is a highly regulated material because of its destructive potential.

- Countries maintain detailed inventories to safeguard it.
- Identifying the origin of nuclear fuel is a difficult task in nuclear forensics. **Nuclear forensics** uses analytical methods to identify the origins of nuclear materials and whether they were used for military applications.
- **Spent fuel from boiling water reactors (BWRs) is hard to differentiate from that from pressurised water reactors (PWRs) b**ecause both "use water as moderator and have similar thermal neutron spectra, so they are quite similar in neutron reaction mechanism.
- Therefore, scientists from China have **trained data from the database to develop three ML models to distinguish fuel from BWRs from that from PWRs.**
- In BWRs, the fuel rods are submerged in water. When the fuel fissions, the water boils and the steam drives a turbine. In PWRs, the fuel rods aren't exposed to the water; only the heat is exchanged.

Topic 30. ISRO PUTS 36 SATELLITES INTO ORBIT

Important for subject: Science and Technology

Indian Space Research Organisation's (ISRO) **GSLV-Mk3/LVM3 successfully put into space 36 satellites of Bharti-backed OneWeb enabling the completion of the UK firm's first generation (Gen-1) Low Earth Orbit (LEO) constellation.** The mission was the **second (1st – GSAT-24) dedicated commercial satellite mission** undertaken **by Space PSU NewSpace India Limited (NSIL)** for Network Access Associates Ltd (OneWeb).

Geosynchronous Satellite Launch Vehicle (GSLV)

- It is a (49 meters tall) is a 3-stage space launch vehicle designed, developed and operated by the ISRO to launch satellites and other space objects into Geosynchronous Transfer Orbits (GTO ~37,000 km).
- **The 1st stage** (S139) generates maximum thrust.

- **The 2nd stage** uses a liquid rocket engine which is known as Vikas engine.
- **The 3rd stage** uses a Cryogenic engine, which uses liquefied oxygen and hydrogen as fuel.
- GSLV has the capability to put a **heavier payload (up to 5,000 kg up to 37,000 km) in** orbit than the Polar Satellite Launch Vehicle (PSLV can carry up to 2000 kg into space up to 600-900 km).
- PSLV is designed mainly to deliver earth observation or remote sensing satellites, whereas **GSLV has been designed for launching communication satellites.**
- GSLV delivers **satellites into a higher elliptical orbit – Geostationary transfer orbit (GTO).** GSLV-D5 – launched in 2014 – was the first successful flight of the GSLV using the indigenous cryogenic engine (CE-7.5).
- The current configuration of GSLV with a CE-7.5 cryogenic engine, can put a payload of up to – 2500 kg in the GTO 5000 kg in Low Earth Orbits (LEO – altitude 2000 km or less)

GSLV MKIII /Launch Vehicle 3

- GSLV MKIII Project was approved in 2002, with a mandate of achieving the capability to **launch a 4-ton (4000 kg) class satellite to Geo-Synchronous orbit, by realizing an indigenously developed launch vehicle.**
- GSLV MKIII (43.5 m height and a gross lift-off weight of 640 tonnes) is configured as a **three-stage vehicle with two solid strap-on motors (S200), one liquid core stage (L110) and a high thrust CUS (configured with the fully indigenous cryogenic engine – CE20).**

Characteristics of GSLV MkIII:

- Performance capability of 4.3 ton to GTO
- Payload capability to support 10 ton to LEO missions Cost effective
- Improved reliability, operability and redundancy management
- Future growth potential of payload with minimal design changes
- To **support manned missions (like Gaganyaan mission) of Indian Space Program**
- The maiden operational flight of GSLV MKIII has successfully launched Chandrayaan-2 spacecraft into the Super Geo-Synchronous Transfer Orbit in 2019.

Details of the Mission

- **NSIL – a central public sector enterprise (CPSE**) under the Department of Space and the commercial arm of the ISRO, **has signed two launch service contracts with M/s One Web, United Kingdom.**
- One Web is a (Bharti group-backed) global communications network, powered from space, enabling connectivity for governments, businesses, and communities.
- As part of this contract**, 36 communication satellites were placed into orbit by LVM3 – ISRO's heaviest launcher**, from Satish Dhawan Space Centre, under the **One Web India-1 Mission.**
- This is the **second LVM3 dedicated commercial launch** (earning the agency upwards of Rs 1,000 crore) and **through this launch LVM3 is making its entry into the Global commercial launch service market**.
- This is the **third (operational) flight of the GSLV MKIII, since it carried India's second lunar mission Chandrayaan-2.**
- The One Web has set a significant benchmark for the Indian space industry in downstream application of satellite communication in India.
- It will pave the way for India to move towards benefiting from remarkable capabilities of LEO connectivity and the spread of space-based internet, bridging the digital divide in the country's most remote areas.

ISRO's Future End eavours

- The space agency is looking at a PSLV commercial mission, GSLV-Mk3 (for Chandrayaan-3) mission and a GSLV-Mk2 mission (for Nisar) in the coming months.
- The **LVM3 mission has also given ISRO more confidence about the rocket** which will be **used for Gaganyaan mission** (Human Spaceflight Programme).

Topic 31. MOORE'S LAW

Important for subject: Science and technology

"Coordinating concept" was used to imply that the law's existence served as one of the things that kept it in place, producing a kind of self-fulfilling prediction.

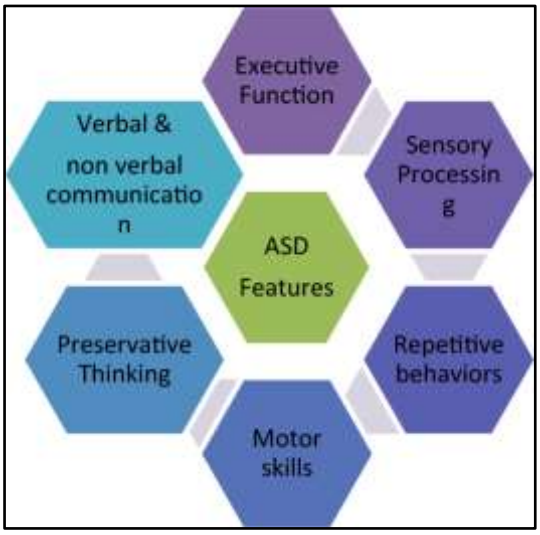
The co-founder of Intel Corporation and the businessman and engineer Gordon Moore, for

whom the law is named, passed away on March 24.

- **Moore's Law** Dr Moore observed that the **number of transistors on an integrated circuit (IC) would double every year**
- Ten years later, he changed it to suggest that the **number will double roughly every two years**.
- **Moore's law has since been proven to be accurate**: the number of transistors on an IC did rise in that way, as several papers, articles, and books have noted.
- According to Moore and Carver Mead, if a **microchip's size is reduced by a certain amount, its efficiency rises by the cube of that amount**, resulting in an exponential gain.
- Moore's law gave the semiconductor sector a means to establish goals and advised militaries and governments on where and how much to invest.
- The law makes it easier for software developers to predict how much larger their releases should be.
- Consumer prices for computer power are falling, while producers' expenses to implement Moore's law are increasing instead of decreasing with each new chip generation.
- These expenditures include R&D, manufacturing, and testing. For Moore's law to continue, rising production costs must be taken into account.

Topic 32. AUTISM SPECTRUM DISORDER (ASD)

Important for subject : Science and technology



Autism spectrum disorder

- Autism spectrum disorder (ASD) is a **neurodevelopmental disability** caused by **differences in the brain.** ASD is a **complicated developmental disorder** characterised by difficulty in social interaction, verbal and nonverbal communication, repetitive behaviour, and a narrow focus of interest.
- ASD is referred to as a "**developmental disorder**" because **symptoms usually appear in the first 2 years of the child.**
- Autism is also termed a "spectrum" disorder because there is **wide variation in the type and severity of symptoms people experience.** Currently, there is **no cure or therapy available to treat or reverse ASD**.

Levels of ASD

- The **Diagnostic and Statistical Manual of Mental Disorders** (DSM-5) considers ASD as a single disorder. The earlier system of classifying various levels of autism is no longer used.
- The **DSM-5 examines the severity of ASD** by **assessing social communication and restricted, repetitive behaviours.**
- Further, the severity of ASD is determined by **assigning a level of support such as 1, 2 or 3based on the individual's need for assistance** and the impact of their symptoms on their daily lives.
- **Level 1**: Patients with autism may have social challenges that need some help as they face trouble starting conversations, responding to others, making friends, etc.
- **Level 2**: At level 2, the individuals require more support as they face communication challenges owing to difficulties to comprehend coherent conversations or understand nonverbal cues.
- **Level 3**: Individuals require the highest level of support as they avoid interacting with others, have aggravated communication challenges and also have repetitive behaviours which affect their ability to function.

Screening tools

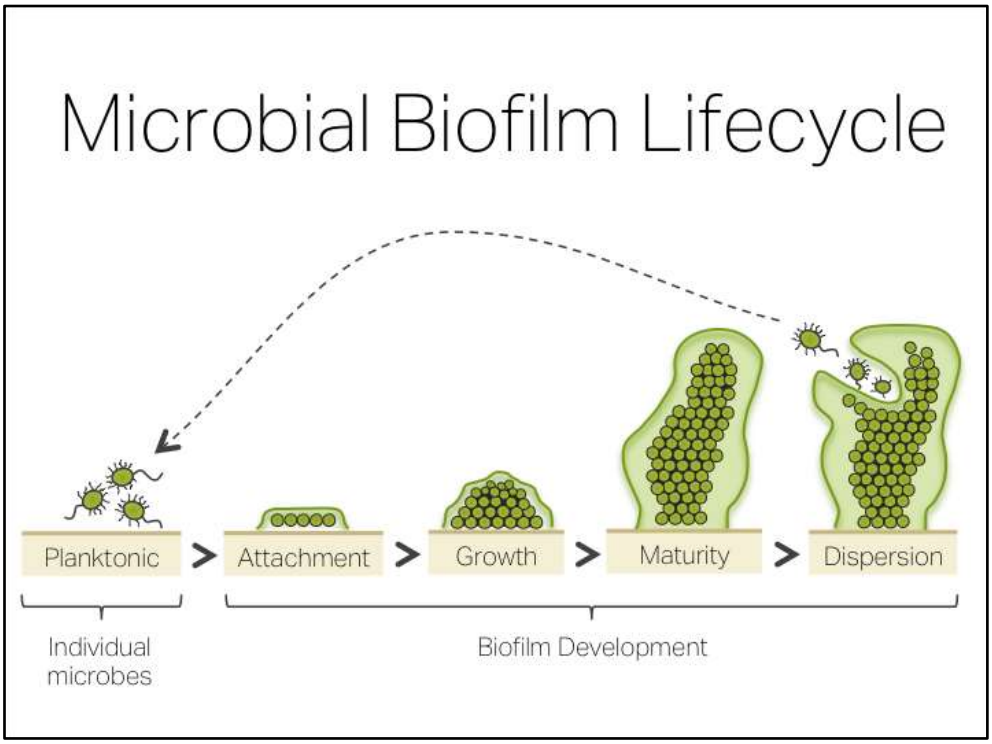
- Doctors have adopted various methods of screening for autism such as informal observations, formal assessments and structured tests.
- **Modified Checklist for Autism in Toddlers (M-CHAT**) is one of the most common

screening tools used to **test children aged 16-30 months**. M-CHAT is a 20- question test.

- The **Ages and Stages Questionnaire** (ASQ) is another general developmental screen that assesses developmental challenges at specific ages.
- The **Screening Tool for Autism in Toddlers & Young Children** (STAT) has 12 activities to assess play, communication, and imitation among toddlers and young children.
- Further, the Childhood Autism Rating Scale uses ratings such as "normal" and "severe" to indicate a level of autism.

Topic 33. BIOFILM BUSTER

Important for subject: Science and Technology



Nano composite coating inhibits biofilm formation during post-operative care. A newly developed **nano composite coating can inhibit biofilm formation and kill attached bacteria**, thereby **helping tackle growing post-operative infections**, a common occurrence these days due to antibiotic resistance in bacteria.

- These **post-operative surgical site infections (SSIs), which, according to WHO, affect 11 per cent of patients in low- and middle-income countries**, are caused by the development of biofilms (groups of bacteria growing in formation that are highly resistant to antibiotics) on the incision site or in the soft tissue inside the site.

- The biofilm matrix, which may **come from existing infections in the patient's body** or transferred from the hospital environment through potential carriers like surgical equipment, wound dressing, or bandage/surgical sutures, **acts as a physical shield against the antibiotics given during operation**, thereby slowing their penetration.
- Antibacterial coating on the surface of these materials can act as potential sources of SSI.
- Conventionally, **antibacterial coatings containing biocides like nanosilver, nanocopper, triclosan, and chlorhexidine have been used to prevent bacterial infections**. Although triclosan and chlorhexidine exhibit antibacterial effects towards a broad spectrum of bacteria, they and other biocides are **found to produce cytotoxicity**. As a result, there is an increasing focus on developing alternative non-cytotoxic materials with antibacterial properties.
- Researchers from ARCI, Hyderabad, have developed a nanocomposite coating (named by ARCI as ATL), **by combining water repellence and biocidal property** (combinatorial approach).
- The **developed coating not only inhibits biofilm formation by restricting bacterial and water adhesion but also kills attached bacteria**.
- ATL was deposited on different surgical sutures made of silk, nylon, and polyglactin 910 (vicryl) in addition to surgical instrument-grade stainless steel 420 coupons and **tested for biofilm inhibition against American Type Culture Collection (**ATCC) and clinical isolate **strains of proven biofilm-forming bacteria such as**
- **Pseudomonas aeruginosa, Acinetobacter baumannii, Staphylococcus aureus and Escherichia coli.**

Biofilms:

- Biofilm formation is a **complex process by which groups of microorganisms**, such as bacteria, **adhere to surfaces and form a slimy layer of cells**.
- Biofilm formation is a **natural process** that occurs in many different environments, including aquatic systems, soil, and the human body.
- Biofilm formation occurs in **several stages**. In the first stage, free-**floating microorganisms attach to a surface** using appendages such as pili or fimbriae.
- This is **followed by the formation of microcolonies**, which grow and produce EPS that hold the cells together. As the biofilm matures, it **becomes more complex and resistant**

to environmental stressors such as antibiotics or immune cells. Eventually, some cells may detach from the biofilm and colonize new surfaces.

- Biofilm matrix is **composed of polysaccharides, proteins, lipids, and nucleic acids**, and provides structural support and protection for the microorganisms. The microorganisms within the biofilm can communicate with each other through a process known as **quorum sensing**, which **allows them to coordinate their behavior** and adapt to changing environmental conditions.
- Biofilms can have both positive and negative impacts on human health and the environment. **Positive impacts include their role in bioremediation, wastewater treatment, and nutrient cycling.** Negative impacts include the formation of bio fouling on surfaces such as **ship hulls and pipes, the development of antibiotic resistance**, and the formation of biofilm-related infections in medical settings.
- The **detection and characterization of biofilms can be challenging due to their complex structure and composition**. Techniques such as confocal microscopy, DNA sequencing, and proteomics can be used to study the composition and behavior of biofilms.

Garcinia pedunculata

- Garcinia pedunculata, **a medicinal plant** commonly called '**borthekera' in Assamese** and **traditionally forbidden for raw consumption**, has been found to protect from heart disease.
- Administration of the **dried pulp of the ripe fruit of the medicinal plant reduced cardiac hypertrophy indicators** and oxidative stress and heart inflammation.
- The **sun-dried slices of the ripe fruit are used for culinary and medicinal purposes** and are known to have therapeutic properties like anti-inflammatory, anthelmintic, antibacterial, antifungal, antidiabetic, hypolipidemic, nephroprotective, and even neuroprotective activity.

Topic 34. ISRO RELEASES IMAGES OF EARTH CAPTURED BY ITS EOS-06 SATELLITE

Important for subject: Science and technology

The Indian Space Research Organisation (ISRO) has released images of Earth captured by the EOS-06 satellite.

Details

- The images are a mosaic generated by the ISRO's National Remote Sensing Centre (NRSC).
- NRSC/ISRO has generated a global False Colour Composite (FCC) mosaic from the images captured by the Ocean Colour Monitor (OCM) payload on board EOS- 06.
- Mosaic with 1 km spatial resolution is generated by combining 2939 individual images, after processing 300 GB data to show the Earth as seen during February 1 and 15.

About EOS-06 satellite:

- The EOS-06 **third generation satellite in the Oceansat series was launched by ISRO** on board the PSLV-C54 along with eight Nano-satellites on November 26, 2022.
- EOS-06 **provides continued services of Oceansat-2 with enhanced payload capability** and carries four payloads OCM-, Sea Surface Temperature Monitor, Ku Band Scattero meter, and ARGOS.
- The EOS-06 is **envisaged to observe ocean color data, sea surface temperature** and **wind vector data to use in Oceanography, climatic and meteorological applications.**
- The satellite also supports value added products such as potential fishing zone using chlorophyll, SST and wind speed and land based geophysical parameters.

Earth Observation satellite

- Earth Observation (EO) satellites are designed for earth observation from space, which includes military use like spying and civilian use like, meteorology and cartography.
- These satellites make essential information available on a vast number of areas, including; ocean salinity, ice thickness, crop health, and air quality.

- The data from these satellites are used for several applications like agriculture, urban planning, rural development, mineral prospecting, environment, forestry, ocean resources and disaster management.

Topic 35. EXEMPTION FOR RARE DISEASES DRUGS

Important for subject : Science and tech / Governance

The Union government declared that all the drugs **and food for special medical purposes imported for personal use for the treatment of all rare diseases** listed under the **National Policy for Rare Diseases, 2021 will be fully exempted from basic customs duty.**

The Union government has **further fully exempted pembrolizumab (Keytruda**), used for **treating various types of cancers, from basic customs duty.** Drugs or medicines usually attract basic customs duty of 10%, while some categories of life-saving drugs/vaccines attract a concessional rate of 5% or nil.

As per the announcements by the government, exemptions are already available for certain drugs for the treatment of spinal muscular atrophy or Duchenne muscular dystrophy.

Since the drugs or special foods used for treating a few diseases are expensive and often need to be imported, the exemption will help reduce the cost and provide much-needed relief to the patients.

What are 'rare diseases?

These are often **serious, chronic, and life-threatening conditions**.

- WHO defines a **rare disease as an often-debilitating lifelong disease or disorder with a prevalence of 1 or less, per 1000 population.** However, different countries have their own definitions.
- A disease or disorder is defined as rare **in India when it affects fewer than 1 in 2500 individuals.**
- There may be as many as 7,000 rare diseases, individual diseases may be rare, and the total number of people with a rare disease is large.
- Examples: **Lysosomal Storage Disorders** (LSD**), Gaucher disease, Pompe disease, cystic fibrosis, muscular dystrophy, spina bifida, haemophilia, MPS 1 and 2, and**

Fabry disease.

Treatment:

- About 95% of rare diseases have no approved treatment even when a correct diagnosis is made.
- Rare diseases are also called 'orphan diseases' and drugs to treat them are called "orphan drugs" because of the expensive nature of available drugs.

About National Policy of Rare Diseases (NPRD):

- The National Policy of Rare Diseases (NPRD) was notified in March 2021.

Aim:

- To increase focus on indigenous research and local production of medicines.
- To lower the cost of treatment of rare diseases.
- To screen and detect rare diseases early at early stages, which will in turn help in their prevention.

Categorization: The policy has categorized rare diseases into three groups:

- **Group 1:** Disorders amenable to one-time curative treatment.
- **Group 2**: Those requiring long-term or lifelong treatment.
- **Group 3**: Diseases for which definitive treatment is available but challenges are to make an optimal patient selection for benefit, very high cost, and lifelong therapy.

Financial Support:

- Provision for financial **support of up to Rs.50 lakhs to the patients suffering from any category of Rare Diseases** and for **treatment in any of the Centre of Excellence** (CoE) **mentioned in NPRD-2021**, **outside the Umbrella Scheme of Rashtriya Arogya Nidhi**. **Rashtriya Arogya Nidhi**
- The Scheme provides financial assistance to patients, living below the poverty line (BPL) and who are suffering from major life-threatening diseases, to receive medical treatment at any of the super speciality Government hospitals/institutes.

Topic 36. SOLOMON ISLANDS

Important for subject : Geography

A state-backed Chinese company recently won a contract to develop a key port in the Solomon Islands.

Solomon Islands:

- It is an **island country consisting of six major islands** and over **900 smaller islands in Oceania.**
- It is situated in the **southwest Pacific Ocean**, approximately 2,**000 km to the northeast of Australia.**
- **Capita**l: Its capital, **Honiara, is** located on the **largest island, Guadalcanal**.
- The terrain is **mountainous and heavily forested**. More than 90% of the islanders are ethnic Melanesians. Once a British protectorate, the **Solomon Islands achieved independence as a republic in 1978.**

Language:

- There are 63 distinct languages in the country, with numerous local dialects. **English is the official language, but Pijin is the common language for the majority of people.**

Topic 37. CENTRE UNLIKELY TO BACK MANIPUR GOVT MOVE TO PULL OUT OF KUKI TRUCE PACT

Important for subject: Geography

The Centre is **unlikely to support the Manipur government's decision to withdraw from a truce agreement with three Kuki-Zomi insurgent groups.**

The Centre's reluctance on the matter has been communicated to the state government although the former agrees with the latter's concern over the recent activities of some Kuki groups.

Background:

- On March 10, 2023 the **Manipur government decided to withdraw from the Suspension of Operations (SoO) agreement with two militant groups, Kuki National Army (KNA) and Zomi Revolutionary Army (ZRA),** alleging their involvement in inciting agitation among forest encroachers.

Kuki Insurgency

- The Kuki insurgency began after **ethnic clashes with the Nagas of Manipur** in the **early 1990s,** with the Kukis arming themselves against Naga aggression.
- The major reason for clashes is **the land claimed by the Kukis as their "homeland" in the Manipur hills overlaps with the imagined Naga homeland of Greater Nagaland** or Nagalim.
- Nearly 30 Kuki insurgent groups operate in Manipur, of which 25 are under tripartite SoO with the Government of India and the state. As many as 17 are under the umbrella group Kuki National Organisation (KNO), and 8 are under the United People's Front (UPF).
- The **Kuki outfits initially demanded a separate Kuki state but now seek a 'Kukiland territorial council.'**

Kuki National Army:

- The Kuki National Organisation/ Kuki National Army (KNO/KNA) was founded on February 24, 1988.
- The objective of the group is to bring together all the areas inhabited by the Kuki tribe.

These areas are **spread across Manipur and Myanmar**.

- The name KNO/KNA (B) was coined and is constituted by the Kukis of Burma. The KNO/KNA, meanwhile, operates in India**.**

Zomi Revolutionary Army (ZRA):

- The ZRA is a militant group operating in the northeastern Indian state of Manipur.
- The group was formed in 1996 with the aim of securing greater autonomy for the Zomi people, an indigenous community living in the region.
- The ZRA is believed to be a splinter group of the larger Zomi Nationalist Movement (ZNM), which was active in the 1980s and 1990s.

Suspension of Operations (SO) Pact

- The **SO agreement with Kuki was signed in 2008 as a ceasefire agreement between the Indian government and various Kuki militant groups operating in the northeastern states of Manipur and Nagaland.**
- Under the agreement, the Kuki militant groups agreed to stop carrying out violent activities and come to designated camps to be monitored by security forces. In return, the Indian government agreed to suspend its operations against the Kuki groups.

Terms of SO Pact:

- The Joint Monitoring Group (JMG) oversees the effective implementation of the pact.
- Security forces, including state and central forces, cannot launch operations, nor can the underground groups.
- Signatories of UPF and KNO abide by the Constitution of India, laws of the land, and territorial integrity of Manipur. They are prohibited from committing atrocities and extortion.
- The militant cadres are confined to designated camps, with arms deposited in a safe room under a double-locking system.
- The groups are given arms only to guard their camps and protect their leaders.

Topic 38. ANJI KHAN BRIDGE

Important for subject: Geography

About Anji Khan Bridge:

It is an **under-construction railway bridge in the Reasi district of Jammu and Kashmir.** It will be the **first cable-stayed railway bridge in India**. It forms a part of the **Udhampur Srinagar Baramulla Rail Link Project (USBRL)** connecting Katra and Reasi Station on the Jammu-Baramulla line.

Features:

- It is an **asymmetrical cable-stayed bridge balanced on the axis of a central pylon**, and it has **tunnels on both ends.**
- The cable-stayed portion of the Anji bridge is 472.25 metres, while the total length of the bridge is 725.5 metres, which is divided into four parts, including an embankment.
- The central span of the bridge is 290 metres; its total deck width will be 15 metres. It stands at the height of 331 metres above the Anji river bed.
- **Trains can run up to 100km/h, and the bridge can withstand wind speeds up to 213 km/hr.**

Topic 39. TORNADOES RIP THROUGH MISSISSIPPI

Important for subject : Geography

A **night of tornadoes left behind a trail of devastation in the US state of Mississippi on Friday.** The extremely powerful and large tornadoes destroyed buildings and knocked out power in multiple states.

About Tornadoes

- A tornado is a narrow, violently rotating column of air that extends from a thunderstorm to the ground.
- Because wind is invisible, it is hard to see a tornado unless it forms a condensation funnel made up of water droplets, dust and debris.
- Tornadoes can be among the most violent phenomena of all atmospheric storms we experience.

- Tornadoes come in many shapes and sizes, and they are often visible in the form of a condensation funnel originating from the base of a cumulonimbus cloud, with a cloud of rotating debris and dust beneath it.
- It is generally accompanied by extreme weather such as heavy downpours, hail storms, and lightning.

What causes tornadoes?

- These violent storms occur around the world, but the United States is a major hotspot with about a thousand tornadoes every year.
- Although they can occur at **any time of the day or night, most tornadoes form in the late afternoon.**
- By this time the **sun has heated the ground and the atmosphere enough to produce thunderstorms.**
- The most violent tornadoes come from supercells, which are large thunderstorms that have winds already in rotation. Tornadoes form **when warm, humid air collides with cold, dry air**.
- The **denser cold air is pushed over the warm air, usually producing thunderstorms**. The **warm air rises through the colder air, causing an updraft**.
- The updraft will begin to rotate if winds vary sharply in speed or direction. As the **rotating updraft, called a mesocycle**, draws in more warm air from the moving thunderstorm, its rotation speed increases.
- **Cool air fed by the jet stream, a strong band of wind in the atmosphere, provides even more energy**.
- Water droplets from the mesocyclone's moist air form a **funnel cloud**. The funnel continues to grow and eventually it descends from the cloud until it touches the ground to become a tornado.
- Once a tornado hits the ground, it may live for as little as a few seconds or as long as three hours.

How tornadoes are forecasted?

- Tornadoes are hard to predict because compared to other extreme weather events, they are relatively small.

- That makes them difficult to observe. Meteorologists use Doppler radar, weather balloons, satellites, and computer modeling to watch the skies for severe storms and tornadic activity.
- Doppler radars record wind speeds and identify areas of rotation within thunderstorms.

Scale to measure the intensity of Tornado

- The **Fujita Scale (F0 to F5)** is used to rate the severity of tornadoes after they occur by the extent of the damage they cause.

F0 is the least intense; F5 the most intense.

Difference between Tornadoes and Funnel Clouds

- A tornado is a tightly **spinning column of air in contact with the ground** beneath a thunderstorm cloud.
- In contrast, a funnel cloud **spins in mid-air without touching the ground**. **Difference between Cyclones and Tornadoes**

Topic 40. DAYLIGHT SAVINGS DISPUTE LEAVES LEBANON WITH TWO TIME ZONES

Important for subject: Geography

The Lebanese government's last-minute decision to delay the start of daylight saving time by a month until the end of the Muslim holy month of Ramadan caused mass confusion on Sunday.

- As some institutions implemented the change while others refused, many Lebanese have found themselves able to juggle work and school schedules across different time zones – in a country that is just 88 kilometers (55 miles) long at its widest point.
- The small Mediterranean country usually puts its clocks forward one hour on the last Sunday in March, which is in line with most European countries.
- On Thursday, however, the **Lebanese government announced a decision by caretaker Prime Minister Najib Mikati to postpone the start of daylight saving time to April 21.**

Daylight saving time (DST)

- **Daylight saving time** (or referred to as Summer Time in Europe) is the practice by some countries of **advancing clocks during summer months by one hour** so that in the evening hours day light is experienced later, while sacrificing normal sunrise times. Also called **Spring Forward, Fall Backward**
- The idea behind DST is to make better use of daylight.
- During the **summer months**, the **sun stays visible for a longer time and sunset happens late in the day** – there is an extra hour of daylight in the evening.
- In the **autumn/winter,** as the days begin to **become shorter and nights longer**, the **clocks are again set back by one hour signalling the end of DST or Summer time**. In effect, it transfers an hour of daylight from evening to morning, when it is assumed to be of greater use to most people**.**

How DST came into being?

- New Zealander George Hudson is said to have proposed the modern idea of daylight saving in 1895. By some accounts, a group of Canadians in Port Arthur (Ontario) were the first to adopt the practice in 1908.
- Germany and Austria-Hungary organized the first implementation, starting on 30 April 1916, during World War I. Several European countries dropped it after the War ended in 1918. The practice returned again during the energy crises of the 1970s.
- Many countries have used it at various times since then, particularly since the energy crisis of the 1970s.

Criticism of DST

- People and governments of many countries are not happy with the requirement of changing time of clocks twice a year.
- Considering the way the way modern societies work, there are grave doubts that DST actually saves much energy.
- Some studies have also found health risks as people lose an hour of sleep while advancing the clocks.

A move to end the practice soon

- In fact, the European Parliament has voted to scrap DST, and starting 2021, the member states of the EU will choose between having a “permanent summertime” or “permanent

wintertime".

- Those who choose the former will reset their clocks for the last time in March 2021; those who choose the latter would do so in October 2021.
- In the US, the changing of clocks is the Important for subject of a debate every year, and a large number of people protest against the practice.

Why India does not follow DST?

- India **does not follow daylight saving time**, **even though there are large parts of the country where winter days are shorter.**
- Daylight Saving Time was observed briefly during the Sino-Indian war in 1962 and the Indo-Pakistani wars in 1965 and 1971 respectively, so that energy consumption by civilians would be reduced.
- Also, **tea gardens in Assam start work at 8am**, continuing a practice started during the colonial rule. This **timing is so widespread that it is nick-named "Bagaan Timing**" or the **tea garden time**.
- In effect, **tea gardens in Assam follow their own informal time zone.**

Topic 41. EUROPEAN COMMISSION GRANTS GI TAG FOR HIMACHAL'S KANGRA TEA

Important for subject: Geography

European Commission (EC) has granted protected geographical indication (PGI) for India's unique Kangra tea, which is grown in Himachal Pradesh's Kangra district.

Kangra Tea:

- It is a type of tea produced in the **Kangra district of Himachal Pradesh**. It is a **high-quality tea** that is **known for its unique flavour, aroma, and color**.
- It is **made from the leaves, buds, and tender stems** of the Camellia sinensis species cultivated in the Kangra valley.

Black tea and green tea have both been cultivated in the Kangra Valley.

- In India, Kangra tea received the Geographical Indication (GI) designation in 2005.

Features:

- Kangra tea leaves are **narrow and have a multi-stemmed frame**. Green tea has a subtle woody aroma, while black tea has a sweet, lasting aftertaste. It has a **light colour** and a high body in liquor.
- The climate, the characteristic **terrain and soil conditions**, and the **coolness of the snow-clad mountains** in the Kangra region all **play a role** in crafting a delightfully distinct cup of quality tea.
- Being one of India's smallest tea regions makes Kangra green and black teas all the more exclusive.
- Kangra tea is not only popular among tea lovers in India but is also **exported to countries such as the United Kingdom, Japan, and the United States.** The tea has also been recognized for its health benefits, including its **antioxidant properties and potential to reduce the risk of cardiovascular disease and cancer.**

European Commission's Protected Geographical Indication:

- The European Commission's Protected Geographical Indication (PGI) is a **system of geographical indications used throughout the European Union** (EU) to protect the names of quality agricultural products and foodstuffs.
- PGI is one of three main categories of geographical indications recognized by the European Union, alongside **Protected Designation of Origin (PDO) and**

Traditional Specialities Guaranteed (TSG).

- The main difference between PGI and PDO is that PGI requires that only one of the stages of production, processing or preparation takes place in the defined geographic area, while **PDO requires all stages of production** to take place in the defined geographic area.
- The PGI system was established to protect and promote the reputation of specific regional products, and to support the economic development of rural areas by encouraging the production of high-quality, distinctive products.
- **Objectives of the protection** the **promotion of products with specific characteristics**, particularly those coming from less-favoured or rural areas; the **improvement of the income of farmers**, in return for a "genuine effort to improve quality"; the **retention of**

population in rural areas; the **provision of clear and succinct information to consumers** regarding product origin.

Topic 42. INDIA TO TAP NEW COKING COAL MARKETS IN MONGOLIA, RAMP UP PRODUCTION IN MOZAMBIQUE

Important for subject: Geography

As per Steel Ministry India is exploring coking coal sourcing options beyond **Australia,** its largest supplier, as it taps into new markets like **Mongolia**; while it firms up plans to ramp up production at its own mines in **Mozambique** in Africa. **Coal is a type of sedimentary rock that is combustible**. It appears in black or brownish-black color. Mostly, coal contains carbon and variable amounts of other chemical elements such as hydrogen, sulfur, oxygen, and nitrogen.

There are different types of coal, such as peat, lignite, sub-bituminous coal, bituminous coal, etc. depending on the composition. Also, we can categorize coal into different types according to the application; thermal coal and coking coal are two such categories.

The key difference between coking coal and thermal coal is that coking coal is mainly used to produce high quality coke, whereas thermal coke is important in producing electricity.

What is Coking Coal?

- Coking coal is a type of coal that is important in making high-quality coke. It is also called metallurgical coal.
- This substance is an essential fuel and is useful as a reactant in the blast furnace process of primary steelmaking. Therefore, the demand for this type of coal is parallel to that of steel.
- Coking coal has a low ash content, low moisture content and low sulfur and phosphorous contents. We can categorize coking coal as a type of bituminous coal depending on the chemical composition.
- During the process of coking (production of coke from coking coal), the material tends to swell and its volume increases.
- The ability of coking coal to form coke relates to its physical properties such as the rank of coal. In contrast to coking coal, thermal coal cannot produce coke when the material is

heated.

Why India needs to import it?

- India, the world's second largest producer of crude steel, is also the largest importer of coking coal, which is a key steel making raw material. The domestic requirement is 57 million tonnes (mt), majority of which is imported.

Thermal Coal

- Thermal coal is a type of coal that is mainly used for the generation of power. This type of coal can produce electricity upon heating. Thermal coal is also named as steam coal.
- However, due to various environmental considerations, the use of thermal coal is limited now.
- The **Future of Life Institute** (**FLI**) is a nonprofit organization that works to reduce global catastrophic and existential risks facing humanity, particularly existential risk from advanced artificial intelligence (AI). The Institute's work is made up of three main strands: grantmaking for risk reduction, educational outreach, and advocacy within the United Nations, US government and European Union institutions. Its founders include MIT cosmologist Max Tegmark and Skype co-founder Jaan Tallinn, and its advisors include entrepreneur Elon Musk.

Topic 43. GREAT NICOBAR PROJECT WILL NOT EVICT TRIBES

Important for subject: Geography

Government says 7.114 sq. km of tribal reserve area is proposed to be utilized for the project, but that is Important for subject to the protection of interests of local tribes people.

Displacement of tribes people will not be allowed to make room for the ₹72,000 crore Great Nicobar island project, the Ministry of Tribal Affairs told the Rajya Sabha on March 29.

The government said the **utilization of the tribal reserve area** will be Important for subject to the following conditions:

- "The **interests of tribal population especially Shompen, a Particularly Vulnerable Tribal Group are not affected adversely**;
    - **Strict implementation of the provisions of Protection of Aborigine Tribe** (PAT)

Regulation to protect the interest of the Shompen;

- The **displacement of tribals will not be allowed**;
- Eco-tourism will be regulated in effective manner." Further, the government said that the **Lieutenant Governor of Andaman and Nicobar Islands had already constituted an Empowered Committee to obtain views and consultations** on the impact of the project. This committee consists of concerned government departments, anthropologists and experts, the Tribal Affairs Ministry said.

Topic 44. CLIMATE CHANGE MAY END UP GREENING THE THAR DESERT

Important for subject: Geography

A study of rainfall and climate data portends the end of the Indian subcontinent's arid northwestern swathes.

Two researchers have **postulated that the demise of the Thar Desert is a distinct possibility** due to global warming.

It is based on their theory on rainfall and climate data, with a **focus on what is known as the 'Indian ocean warm pool'**, or IOWP.

- The existence of this warm region in the Indian Ocean has been known for decades and is a source of monsoons. And now, **with global warming, the IOWP is expanding westwards.**
- With the **IOWP expanding westward**, the 'length of the rainy season' **would result in "a 50-100 per cent increase in the mean summer rainfall over the semi-arid northwest** of India".
- As global warming is likely to continue at least till the end of the century, westward expansion of the Indian monsoon will continue. The length of the monsoon season is expected to increase from about 70 days to about 90 days and annual rainfall to increase from about 45 cm to about 70 cm by that time. The **increased rainfall spread over a longer season will help grow taller vegetation.**
- However, during the dry winter season, the **plants may die unless water is made available through irrigation or uplift of the water table**. So, greening could be accelerated if the run-off during the monsoon season could be harvested.
- In the long term, the increased rainfall has the potential to green the desert and

significantly increase food productivity in the region. But in the short term, it is necessary to plan for harvesting the excess water to increase groundwater reserves.

Indian Ocean Warm Pool

- The Indian Ocean Warm Pool (IOWP) is a region of the Indian Ocean that is characterized by **sea surface temperatures of more than 28°C throughout the year**.
- The Indian Ocean Warm Pool is **located in the western part of the Indian Ocean**, **primarily in the region bounded by the eastern coast of Africa**, the northern coast of Madagascar, and the southern coast of India.
- **IOWP Formation:** Atmospheric winds cool the ocean surface through evaporation, sometimes forcing colder, deep waters to come up — a phenomenon known as '**upwelling'**. This happens near the Somalia coast in the western Arabian Sea during summers. The **waters in the region are cooler, leaving a 'warm pool' elsewhere.**
- The Indian Ocean Warm Pool plays an important role in the global climate system, as it **influences the monsoon climate** of the Indian subcontinent and the surrounding regions. The high sea surface temperatures in the IOWP lead to **increased evaporation**, which in turn **contributes to the formation of the monsoon rains.**
- The warm temperatures and high levels of sunlight **promote the growth of phytoplankton**, which forms the **base of the marine food chain**. The region is also home to a diverse range of marine life, including coral reefs, fish, and marine mammals.

Thar Desert

- The Thar Desert, also known as the **Great Indian Desert**, is a **large arid region in the northwestern part of India** and the eastern part of Pakistan.
- The Thar Desert is located in the **northwestern part** of the Indian subcontinent, covering an area of approximately 200,000 square kilometers. It **spans across the states of Rajasthan, Gujarat, Haryana, and Punjab in India**, and the eastern part of Pakistan.
- The Thar Desert is **characterized by extreme climatic conditions**, with **high temperatures during the day and low temperatures at night**. The region experiences **very little rainfall, with an average annual rainfall of less than 250 mm.** The climate is also marked by strong winds, dust storms, and sandstorms.

Thar Desert Formation

- The amount of rain falls from east to west. The **western region of Rajasthan receives little to no rainfall.** This is because of the following factors.
- The **Arabian Sea branch of the southwest monsoon** blows through Gujarat's Kathiawar area and escapes to the north-west.
- There are **no towering mountains to keep these winds at bay**. The **Aravalli range in Rajasthan runs parallel to the path of the monsoon winds** and cannot prevent them from moving north.
- The region's high temperatures improve the water retention capacity of the winds and diminish the likelihood of rainfall.
- Despite the harsh climatic conditions, the Thar Desert is **home to a diverse range of flora and faun.** The region is known for its unique desert vegetation, including **thorny bushes, shrubs, and cacti**. The desert is also home to several species of reptiles, birds, and mammals, including the **Indian gazelle, the Indian wolf, and the desert fox**.
- The Thar Desert is sparsely populated, with a few scattered human settlements. The region is home to **several indigenous communities**, including the Rajputs, the Jats, and the Meghwals. Thar Desert has the **highest population density** of any desert on the planet.
- Water is a scarce resource in the Thar Desert. The **Luni River is the only large river** in this area. The **region relies heavily on groundwater reserves**.
- However, overexploitation of groundwater has led to a depletion of the water table, posing a threat to both human and animal populations in the region.
- The Thar Desert is a **rich source of minerals** and other natural resources, **including coal, gypsum, and marble**. The region is also **known for its handicrafts, particularly embroidery and weaving**. Tourism is another important economic activity in the region, with several **desert safaris and camel rides** attracting visitors from around the world.
- The Thar Desert faces several environmental challenges, including **soil erosion, desertification, and loss of biodiversity**. Climate change is exacerbating these challenges, with rising temperatures and changing rainfall patterns affecting the desert ecosystem.

Topic 45. SORGHUM'S ALKALINE TOLERANCE CAN IMPROVE CROP YIELDS

Important for subject : Geography

As the world's soils continue to be impacted by salt, **researchers have identified a protein that plays a crucial role in helping plants like sorghum grow in alkaline, salty soils.** The findings could inform the design of crops better suited to grow in underutilised sodic lands.

Researchers performed a genome wide association **study of plant growth in alkaline conditions using sorghum and identified Alkaline Tolerance 1 (AT1**) -a major locus specially related to the plant's sensitivity to alkaline, sodic soils.

Sorghum Crop

- **Sorghum, also called great millet, Indian millet**, is cereal grain plant of the grass family (Poaceae) and its edible starchy seeds.
- Sorghum plants are **very hardy and can withstand high temperature and drought conditions.**
- The plant **originated in Africa, where it is a major food crop**. The **variety of the crop found in India is called jowar that originated here.** The grain is popular across the world because it has **a low glycaemic index, is gluten-free and nutritious.**

Note: The **lower the glycemic index of a cereal, the lower is the relative rise in blood glucose level after two hours of consuming it.**

- The key varieties of millets include Sorghum, Pearl Millet, Ragi, Small Millet, Foxtail Millet, Barnyard Millet, Kodo Millet and others. Jowar has a dedicated All-India Coordinated Research Project since 1969.

Cultivation of Jowar/Sorghum in states

- Jowar is a **tropical crop of Madhya Pradesh and is cultivated in the northwestern districts of Maharashtra**
- Kharif crop is cultivated in the districts like Ujjain, Morena, Ratlam, Shivpur, and Bhind. The Jowar Rabi crop is cultivated in the districts of MP like Chhindwara, Khandwa, Balaghat, Dhar, Jhabua, Khargone, and Seoni.
- In geography, it has been seen that Jowar/Sorghum is a **kind of crop that can be raised**

in both Rabi and Kharif seaso It can be seen that **regions having less than 100 cm rainfall is the proper place for the growth of this crop.** It grows **well in the dry regions where there is no irrigation for provision**.

- Different varieties of soil are needed for the cultivation of this crop and the district of MP has the variety of soil for the production of this crop. The growth of this crop can mainly happen in the plain regions of MP but it is also raised in the gentle slopes of 1200 meter height.

Topic 46. SC TO HEAR PLEA AGAINST REMISSION IN BILKIS BANO CASE

Important for subject : Polity

Chief Justice of India D.Y. Chandrachud told Bilkis Bano that a Special Bench would be formed to hear her petition, challenging the release of 11 men sentenced to life imprisonment for her gang rape during the 2002 riots.

Background

- Already, a Review Bench led by Justice Rastogi had **dismissed a petition filed by Ms. Bano to review a May 2022 judgment of the court.**
- This judgment had cleared the path for Gujarat to consider and release the convicts, who were serving life sentence in her case, under the **State's Premature Release Policy of 1992.**

The Gujarat government had argued that the decision to release the convicts prematurely had been taken after **following the procedure established by law.**

Review petition by Bilkis Bano

- Her petition had wanted the court to reconsider its judgment which permitted the Gujarat government to apply the State's Premature Release Policy of 1992.
- Through her review petition, Bano said the remission policy of the State of Maharashtra, where the trial happened, and not Gujarat would have governed the case.
- In May 2022, the Supreme Court ruled that there cannot be a concurrent jurisdiction of two State governments on the issue of remission.
- Premature release of a convict has to be considered in terms of the policy applicable in the State where the crime was committed

- Hence, Gujrat government's remission policy was applied for the release of these convicts.

Power of SC to review its judgments Constitutional provision:

- A ruling by the Supreme Court is final and binding. The SC rarely entertains reviews of its rulings.
- However, **Article 137 of the Constitution grants the SC the power to review its judgments or orders.**
- A review petition **must be filed within 30 days of pronouncement of the judgment.**

Grounds for review:

- In a 2013 ruling, the Supreme Court itself laid down **three grounds for seeking a review of a verdict it has delivered:** the discovery of new and important matter or evidence which, after the exercise of due diligence, was not within the knowledge of the petitioner or could not be produced by him; mistake or error apparent on the face of the record; or any other sufficient reason.
- In subsequent rulings, the court specified that "any sufficient reason" means a reason that is analogous to the other two grounds.
- In another 2013 ruling (Union of India v. Sandur Manganese & Iron Ores Ltd), the court laid down nine principles on when a review is maintainable.

Procedure followed while hearing the review cases :

- **Except in cases of death penalty,** review petitions are heard **through circulation by judges in their chambers, and not in an open court.**
- Lawyers make their case **through written submissions and not oral arguments**. The **judges who passed the verdict decide on the review petition as well**. **What if a review petition fails?**
- In Roopa Hurra v Ashok Hurra (2002), the court itself evolved the **concept of a curative petition, which can be heard after a review is dismissed.**
- It is meant to ensure there is no miscarriage of justice, and to prevent abuse of process.
- A curative petition is also entertained on very narrow grounds like a review petition, and is generally not granted an oral hearing.

Topic 47. THE DISQUALIFICATION CONUNDRUM

Important for subject : Polity

The disqualification of Rahul Gandhi from his membership of the Lok Sabha has brought back discussions as to whether the earlier protection enjoyed by serving legislators from immediate disqualification must be restored.

Past protection

- **Section 8(4) of the Representation of the People Act (RPA), 1951,** allowed convicted MPs, MLAs and MLCs to **continue in their posts, provided they appealed against their conviction/sentence in higher courts within three months of the date of judgment by the trial court.**
- However, in 2013, the Supreme Court through its landmark judgment in **the Lily Thomas v/s Union of India case, struck down Section 8(4) of the RPA, 1951.**
- The Section was **declared unconstitutional by the apex court** on the ground that the Parliament did not have the required legislative competence to enact such legislation.
- According to the Supreme Court, **Article 102 of the Constitution** had mandated Parliament to **enact a common law prescribing terms and conditions to disqualify an individual** for both "being chosen as" as well as "being a member" of Parliament (Article 191 is the corresponding article for State Assembly and Legislative Council).
- However, as per **Sub-section (4) of Section 8 of RPA the mere act of filing an appeal would operate as a stay on disqualification until its disposal.**
- The apex court had ruled that by creating one provision for the immediate disqualification of ordinary citizens and another one for deferred disqualification of legislators, Parliament had violated the constitutional mandate.

What was the government's stand?

- The then government had tried to defend the protection clause for sitting members with two arguments:
- The government had argued that such a clause would become crucial if in case a regime has a wafer-thin majority, and an immediate disqualification of a member or two from the date of conviction may result in a loss of majority and a change of regime.
- The government had also argued by saying that immediate disqualification would require

the conduct of a by-election and if in case the conviction is dismissed by an appellate court after the by-election's outcome, then the result cannot be reversed, and the exonerated former member cannot be restored as a member.

- The government further said that the Parliament was not making two different provisions for governing disqualification, as the protection clause only postpones the time of disqualification which does not mean that members were Important for subjected to a different kind of treatment.
- The Supreme Court **however rejected these arguments** and **held that a member facing immediate disqualification could only file an appeal and seek a stay on the conviction.**
- The court also clarified that the disqualification will cease to operate from the "date of stay" of conviction by an appellate court.

The relevancy of the date of stay

The "**date of stay" of conviction** has also given rise to various questions.

- In most of the cases, there has been no stay on conviction, as the Supreme Court has often said that **only suspension of sentence, grant of bail and pending appeals are to be treated as normal remedies, and stay of conviction should be given only rarely.**
- Various examples of leaders who had lost their membership and later went on to either succeed or lose in their appeal have not created any major controversies.
- However, a **Lakshadweep MP who was convicted and sentenced to a 10-year prison term in January 2023 managed to get a stay of conviction from the Kerala High Court**, but by then, **his seat was declared vacant by the Lok Sabha secretariat and a date was also fixed by the EC for the byelection.**
- The MP challenged this in the Supreme Court and **the EC said it would honour the court's stay order**. However, the MP's Lok Sabha membership is yet to be restored.
- The main reason for **the delay in the restoration is that the date of conviction is when the disqualification comes into effect, but the stay of conviction starts only from the day the stay is granted, which means that during the intervening period, the member did suffer disqualification.**
- Thus, there are questions such as can the membership be restored or restituted with retrospective effect from the date of conviction.

Recommendations

- The Secretariat of the respective Houses **must accept the order of stay on conviction and restore the membership without further ado until the appeal is complete.**
- The secretariat must also be **mandated to wait until the convicted members approach the appellate courts for a stay of conviction and notify a vacancy only if the application is dismissed.**
- Further, the **President or Governor should exercise their powers under Article 103 and Article 192 (State Legislature**) and **formally declare a member to be disqualified instead of using the "automatic" disqualification route**.

Topic 48. BODOLAND TERRITORIAL COUNCIL

Important for subject: Polity

The **Bodoland Territorial Council (BTC) of Assam is to start its Mission Happiness** programthroughout the Bodoland Territorial Area (BTR).

About:

- The Bodoland Territorial Council (BTC) government will begin implementing its **Mission Happiness in April** over the 9,000 sq. km (BTR).
- After consulting with various groups of individuals to understand and evaluate the causes of their "anger, frustration, and dissatisfaction," all stakeholders were included in the development of the course material.
- Former radicals, government officials, political leaders, members of civil society, delegates from various ethnic, linguistic, and religious groups, as well as the "downtrodden individuals at the bottom of the barometer of happiness" are among the contributors.

Bodoland Territorial Council (BTC)

- The **Bodoland Territorial Council** (BTC) was **created under the 6th Schedule of the Indian Constitution** following the Memorandum of Settlement between the Bodoland Liberation Tiger Force (BLTF), the Government of India, and the Government of Assam.
- It is an **autonomous region within Assam**. It consists of four districts (Kokrajhar, Chirang, Baksa, and Udalguri) that are situated by the foothills of Bhutan and Arunachal

Pradesh on the north bank of the Brahmaputra river.

- The BTC is made up of **40 elected members and an additional six that the Assam Governor appoints.**
- A Speaker leads the Bodoland Territorial Council, while a Chief Executive Member chairs the executive committee.
- The BTC region is located within India's least developed zone on the map. The people's main source of livelihood is the agro-economy. There are few industrialization and other employment opportunities.

Power and Function

- The Bodoland Territorial Council's **executive and legislative authority derives from the provisions of the Sixth Schedule of the Indian Constitution as well as the 2003 and 2020 Bodoland Peace Agreements.**
- The Bodoland Territorial Council has the authority to levy taxes, fees, and tolls on a variety of items, including land, buildings, animals, vehicles, boats, goods entering the region, transportation by ferry or bridge, sanitation, employment, and income, as well as general taxes for the upkeep of roads and schools.

Autonomous District Councils and Sixth Schedule

- **According to Article 244**, the **administration of the tribal areas in the four northeastern states of Assam, Meghalaya, Tripura, and Mizoram** is covered by the **sixth schedule of the Indian Constitution.**
- The Indian Constitution's 6th Schedule permits the **creation of autonomous administrative units** that have been granted autonomy within their respective states.
- The **State Governor has the authority to modify the boundaries of the autonomous districts, including changing their names.** In terms of their administration, **the 6th Scheduled Areas fall under the State's executive authority.**
- Some autonomous districts and autonomous regions are exempt **from the laws of the Parliament or the state legislature,** or **they do so with specific modifications and restrictions.**
- These Autonomous Councils have been **given extensive civil and criminal judicial powers,** including the ability to set up village courts, among other things.

- The **relevant High Court has jurisdiction over these councils**. Along with ADCs, the **Sixth Schedule also provides for separate Regional Councils** for **each area constituted as an autonomous region.**
- In all, there are **10 areas in the Northeast** that are **registered as autonomous districts** – **three in Assam, Meghalaya and Mizoram and one in Tripura**.
- These **regions are named as district council of (name of district) and regional council of (name of region).**
- Each autonomous district and regional council consists of not more than 30 members, of which four are nominated by the governor and the rest via elections.

All of them remain in power for a term of five years.

- The Bodoland Territorial Council, however, is an exception as it can constitute up to 46 members.

Topic 49. SC GIVES STATES, UT'S , HC'S 3 MONTHS TO SET UP ONLINE RTI PORTAL

Important for subject : polity

The Supreme Court has directed the States and Union Territories to set up and operationalise online Right to Information (RTI) portals within three months to ensure transparency in governance.

Section 6(1) of the Right to Information Act, 2005 stipulated that an information seeker had a statutory right to move an application through electronic means. However, several High Courts and most district courts entertain only physical RTI applications.

Background

- The Supreme Court launched an online portal that will help citizens file and access applications under the Right to Information (RTI) Act in matters related to the court.
- Though the Act was enacted in October 2005, after a lapse of 17 years, online web portals are still to be operationalised by some of the High Courts.

Section 6 of RTI Act : Manner of making a request for information

- Section 6(1) provides for the manner of making a request by a person who desires to

obtain any information under this Act.

Manner of making requests: In **writing or through electronic means**.

- **Language:** English/Hindi/official language of the area in which the application is being made.
- **Any fee**: Such application shall be accompanied by the prescribed fee.
- **To whom application is made**: To the CPIO/SPIO of the concerned public authority or to the Central Assistant Public Information Officer/State Assistant Public Information Officer.
- **Contents of application**: Particulars of information sought by the applicant.

When the request cannot be made in writing

- The proviso to Section 6(1) deals with a case where the applicant has made an oral request for information. It states that where a person cannot make a written request, the CPIO/SPIO shall assist such person to reduce his request in writing.

Applicant need not give his details

- As per **Section 6(2),** a person seeking information under the Act need not disclose any reason for such request or his personal details except such information that might be required for contacting him.

When the information requested is held by another public authority, etc:

- **Section 6(3)** deals with the case where an application is made to a public authority requesting information that is held by another public authority, or the Important for subject matter of which is more closely related with the functions of another public authority. In this case, the public authority to whom the application is filed must transfer the application, or the concerned portion of it, to that other public authority and notify the applicant of the transfer as soon as possible. The section provides for a maximum of five days for transferring the application.

Topic 50. BOMMAI GOVT'S BID TO SCRAP 4% MUSLIM QUOTA TOUCHES OFF FIRESTORM

Important for subject : Polity

There seems to be no data based rationale behind Karnataka Cabinet's decision to **scrap reservation for Muslims under Category 2B in the Other Backward Classes (OBCs)** and distribute them among the two dominant communities of **Vokkaligas and Lingayats under the two newly formed categories 2C and 2D.**

Karnataka State Commission for Backward Classes had not only not recommended these interventions, but had **specifically recommended that no changes be effected in the reservation matrix till it submitted its final report.**

Reservation for Lingayats and Vokkaligas

- The Cabinet already created **category 2C and 2D to accommodate the castes that figured in 3A (Vokkaliga) and 3B (VeerashaivaLingayat) till then**.
- The **decision was based on the interim report** on the demand of several communities for increase in reservation, submitted by the Karnataka State Backward Classes Commission.

Karnataka's reservation policy before the changes

- Reservations for Scheduled Castes, Scheduled Tribes, Backward Classes, and Muslims are capped at 50% in accordance with an order of the Supreme Court.
- The quota break-up is as follows: Category I (Backward Classes) 4%; Category II A (OBCs) 15%; Category II B (Muslims) 4%; Category III A (Vokkaligas, etc.) 4%; Category III B (Lingayats, Marathas, Bunts, Christians) 5%; SCs 15%; and STs 3%.
- A total 95 communities and their sub-sects are recognized as Backward Classes, and 102 communities and their sub-sects as OBCs.

Concerns over the change

- A senior Minister in the government, on condition of anonymity, told that the decision was "ad_hoc" and was borne out of "political compulsions".
- More significantly, why not hike reservation for other communities in Categories 1 and

2A that are more backward than the land owning communities.

- Indra Sawhney judgment of the Supreme Court clearly says any addition or deletion of a community from the reservation matrix must be based on an empirical databased study by the commission.
- Reservation to muslims is based on their backwardness and not religion.

Topic 51. GST APPELLATE TRIBUNAL

Important for subject :Polity

A **four-member appellate tribunal is likely to be set up in each state in** order to streamline and **expedite the dispute resolution process with regard to Goods and Services Tax (GST).**

Goods and Service Tax Appellate Tribunal (GSTAT)

- The **Central Goods and Service Tax Act, 2017 (CGST Act)** mandates the constitution of a **Goods and Service Tax Appellate Tribunal(GSTAT) and its Benches**. GSTAT would be a specialized appellate authority for resolving disputes.
- The GSTAT is envisaged as the body that will help adjudicate and resolve disputes around the indirect tax scheme and protect the rights of taxpayers and the revenue interests of the union and state governments.

Delay in setting up of GSTAT

- GSTAT has not yet been applied even after 5 years of GST execution.
- Multiple reasons exist for the late GSTAT creation such as the qualification and experience criteria of technical members, the number and constitution of Benches, and the figure of a search and selection committee.

Proposed composition of GSTAT

A **four-member appellate tribunal** is likely to be **set up in each state**.

- Each state appellate tribunal **would have two technical members** (one officer each from the centre and states) and **two judicial members.**
- The judicial members will be **selected from a panel of serving or retired High Court**

and District Court judges.

Division Bench

- A **division bench comprising two members** — one technical and one judicial — will decide the appeals brought before it.
- As per the proposal, **each state appellate tribunal will have two division benches** and thus will be able to deal with more appeals.

National Appellate Tribunal

- There will also be a **National Appellate Tribunal, which would be set up in Delhi**. It will comprise one judicial member and one technical member.
- The national appellate bench will mainly look into appeal cases on disputes between the department and assessee over the 'place of supply' under the GST regime. It, **however, will not take up any appeal with regard to divergent rulings by state appellate tribunals.**
- The Goods and Services Tax (GST) Appellate Tribunal is **likely to be headed by a former Supreme Court judge or a former Chief Justice of a High Court.**

Framework of GST Tribunal is likely to permit the **resolution of disputes involving dues or fines of less than Rs. 50 lakh by a single-member bench.**

Topic 52. SC TO HEAR PLEAS AGAINST POLYGAMY AND NIKAH HALALA

Important for subject :Polity

The Supreme Court said it will **set up a fresh five-judge Constitution bench** at an "appropriate stage" to **hear pleas challenging the constitutional validity of polygamy and 'nikah halala' among Muslims.**

A bench comprising Chief Justice DY Chandrachud and Justices PS Narasimha and JB Pardiwala was urged by lawyer Ashwini Upadhyay, who has filed a PIL on the issue, that **section 494 of the Indian Penal Code allows ploygamy, halala etc. and needs to be struck down**.

Polygamy– It allows a Muslim man to have four wives**.**

Nikah halala

- The Koran allows a man to **divorce his wife a maximum of two times**. If the **man divorces his wife for the third time, he is not allowed to marry her again**.
- This bar was laid down in order to save women from temperamental husbands who divorce in a fit of anger, then cancel it, then divorce again, unleashing an endless cycle of marriage and divorce.
- After the third talaq, the woman becomes an independent being with full choice over her life and it empowers them to take independent decisions.
- **Nikah halala-** It deals with the process in which a Muslim woman, who wants to remarry her husband after divorce, has to first marry another person and get a divorce from him after consummation.
- **Prevalenc**e- No cases of halala have been reported from Saudi Arabia, the UAE, Kuwait and Yemen.
- In India, the **Muslim Women's Protection of Rights on Marriage, passed after invalidation of triple talaq by the Supreme Court, is silent on nikah halala.**

What procedures are followed by Muslims for divorce?

- **Instant triple talaq (Talaq-e-biddat**)- In instant triple talaq a man pronounces multiple divorce in one go.
- It has no scope for reconciliation between the couple, and often ends a marriage instantly. It is not mentioned anywhere in the Quran which prescribes a code of divorce.
- **Instant triple talaq has been banned in many Muslim countries, including Egypt, Syria, Jordan, Kuwait, Iraq and Malaysia.**
- **Instant triple talaq is banned in India**.

Talaq-e-Hasan

- Talaq-e-Hasan is **pronounced with a gap of at least one month or one menstrual cycle.**
- Only a single revocable divorce takes place through the first pronouncement of Talaq-e-Hasan and the couples are supposed to live together after this pronouncement and have the option of rapprochement.
- At the end of this month, the husband has to pronounce divorce for the second time which is revocable, and the couple may resume their conjugal relationship anytime they desire.

- If the third pronouncement is made after at least one menstrual cycle, then irrevocable divorce takes place.
- No divorce can be administered when the woman is undergoing her menstrual cycle or pregnancy. **Unlike instant triple talaq, the Quran clearly mentions the process of Talaq-eHasan.**
- Talaq-e-Ahsan- Under this form, a single pronouncement is made following which a woman has to go through iddat or a waiting period of three months.
- During this period the divorce can be cancelled and the failure to annul divorce during this period results in divorce.
- **Khula- In Khula**, a woman gives something to the man in return for annulling the marriage.
- **For men the procedure given by Quran to divorce is Talaq-e-Hasan**; **for women the procedure to give divorce is called khula. Mubarat- In Mubarat**, **both the parties desire divorce**.

Topic 53. DISQUALIFICATION OF MPS AND MLAS

Important for subject: Polity

Congress leader Rahul Gandhi was held guilty and sentenced to two years in jail in a 2019 defamation case over his remarks about the "Modi surname" by a court in Gujarat's Surat.

- The **court, which held Gandhi guilty, also granted him bail and suspended the sentence for 30 days** to allow him to appeal in a higher court.
- Gandhi's conviction has led to questions over his status as a Member of Parliament from Wayanad, Kerala.
- A **conviction which carries a sentence of two years or more will automatically result in disqualification. Legal provisions regarding the disqualification of MPs/MLAs** Disqualification of a lawmaker **is prescribed in three situations.**
- First is through the **Articles 102(1) and 191(1)** for disqualification of a member of Parliament and a member of the Legislative Assembly respectively.
- The grounds here include holding an office of profit, being of unsound mind or insolvent or not having valid citizenship.
- The second prescription of **disqualification is in the Tenth Schedule of the**

Constitution.

- This provides for the disqualification of the members on grounds of defection. The third prescription is **under The Representation of The People Act (RPA), 1951**. This law provides for **disqualification for conviction in criminal cases**.

Under Representation of The People Act, 1951

- There are several provisions that deal with disqualification under the RPA. **Section 8 of the RPA** deals with disqualification for conviction of offences. **Section 8(1)** of the act includes specific offences such as promoting enmity between two groups, bribery, and undue influence or personation at an election.
- **Section 8(2)** lists offences that deal with hoarding or profiteering, adulteration of food or drugs and for **conviction and sentence of at least six months for an offence under any provisions of the Dowry Prohibition Act.**
- **Section 8(3)** disqualifies a convicted person **who has been sentenced to imprisonment for not less than two years.**
- He is **disqualified from the date of such conviction and shall continue to be disqualified for a further period of six years since his release.**
- **Section 9** deals with **disqualification for dismissal for corruption or disloyalty**, and for entering into government contracts while being a lawmaker.
- **Section 10** deals with **disqualification for failure to lodge an account of election expenses.**
- **Section 11** of the act **deals with disqualification for corrupt practices**.

How does the disqualification operate?

- The **disqualification can be reversed if a higher court grants a stay on the conviction** or **decides the appeal in favour of the convicted**
- In 2018, in 'Lok Prahari v Union of India' case, the **SC clarified that the disqualification will not operate from the date of the stay of conviction by the appellate court**.
- Here, it **should be noted that the stay cannot merely be a suspension of sentence, but a stay of conviction.**
- Under **Section 389 of the Cr PC, an Appellate Court can suspend the sentence of a**

convict while the appeal is pending. This is akin to releasing the appellant on bail.

How does an appeal against the conviction impact disqualification?

- **Section 8(4) of the RPA stated** that the **disqualification takes effect only after three months have elapsed from the date of conviction.**
- Within that period, a person can file an appeal against the sentence before the higher Court.
- Earlier, the law had provided for a pause on disqualification if an appeal against the conviction was filed before a higher court.
- However, in **the landmark 2013 ruling in 'Lily Thomas v Union of India', the Supreme Court struck down Section 8(4) of the RPA as unconstitutional.**
- This means that **simply filing an appeal will not be enough to prevent disqualification.**
- The **convicted MP must secure a specific order of stay against the conviction of the trial court.**

Topic 54. FINANCE BILL 2023

Important for subject : Polity

With the **approval of the Finance Bill 2023** by both Houses of Parliament, the **government completed its 2023–2024 budget exercise.**

Finance Bill

- The Finance Bill, which is a component of the Indian Union Budget, **outlines all the legal changes necessary to implement the proposed changes to taxation made by the finance minister.**
- The Finance Bill, as a Money Bill, **must be approved by the Lok Sabha**, the lower house of the Parliament, **before it can become the Finance Act**.
- The **Finance Bill is a Money Bill in which the government proposes new taxes, makes changes to the existing tax system, or makes suggestions for the continuation of the current tax system for a specific amount of time after the Parliament initially authorized it.**

Characteristics of the Finance Bill

- Finance Bills are divided into three categories: the **Money Bill, Finance Bill Category I, and Finance Bill Category II.**
- Money Bills include elements that deal with regulation or borrowing, changes to national or state tax rules, the withdrawal of funds from a contingency or consolidated fund, etc.
- Both types of finance bills include clauses that deal with taxes, spending, and other issues. A **Money Bill will always be a Finance Bill**. However, a **Finance Bill need not necessarily be a Money Bill.**
- Only those financial bills are money bills which contain exclusively those matters which are mentioned in Article 110 of the Constitution. **These are also certified by the Speaker of Lok Sabha as money bills.**
- A **money bill cannot be returned by the president for any reason**. The **Finance Bill must be enacted (passed by the Parliament and assented to by the president) within 75 days of introduction**.
- The **Finance Act legalises the income side of the budget** and **completes the process of the enactment of the budget.**

More about Financial Bills

- Financial bills are those bills that deal with fiscal matters, that is, revenue or expenditure.

Financial bills are of three kinds:

- Money bills–Article 110
- Financial bills (I)–Article 117 (1)
- Financial bills (II)–Article 117 (3)

Financial Bills (I)

- A financial bill (I) is a bill that contains the **matters mentioned in Article 110, and also other matters of general legislation.**
- A financial bill (I) is **similar to a money bill in two respects**; Both of them can be **introduced only in the Lok Sabha** and not in the Rajya Sabha.
- Both of them can be **introduced only at the recommendation of the president**.
- In all **other respects, a financial bill (I) is governed by the same legislative procedure applicable to an ordinary bill**. Hence, it can be **either rejected or amended by the**

Rajya Sabha.

- In case of a **disagreement between the two Houses over such a bill, the president can summon a joint sitting of the two Houses to resolve the deadlock.**
- When the **bill is presented to the President, he can either give his assent to the bill or withhold his assent to the bill or return the bill for reconsideration** in the Houses.

Financial Bills (II)

- A financial bill (II) contains provisions involving expenditure from the Consolidated Fund of India but does not include any of the matters mentioned in Article 110.
- It is **treated as an ordinary bill in all respects**. The only special feature of this bill is that it **cannot be passed by either House of Parliament unless the President has recommended to that House the consideration of the bill.**
- Financial bill (II) can be **introduced in either House of Parliament** and a **recommendation of the President is not necessary for its introduction**.
- The **recommendation of the President is not required at the introduction stage but is required at the consideration stage.**
- It can be either rejected or amended by either House of Parliament. In case of a disagreement between the two Houses over such a bill, the President can summon a joint sitting of the two Houses to resolve the deadlock.
- When the bill is presented to the President, he can either give his assent to the bill or withhold his assent to the bill or return the bill for reconsideration in the Houses.

Topic 55. BOND

Important for subject: Economy

Bond is a fixed-income instrument that represents a loan from an investor to a borrower. It is a contract between the investor and the borrower, where the borrower uses the money to fund its operation and the investors receive interest on the investment.Bonds are high-security debt instruments that fall under the fixed income asset class.

- It enables an entity to raise funds to fulfill the capital requirement for funding various projects.
- These are issued by the government, corporates, municipalities, states, and other entities to fund their projects may be backed or not backed by assets.

- These bonds have a maturity date (tenure) and when once that is attained, the issuer needs to pay back the amount along with a part of the profit to the investor.

Bonds have three components that are used to calculate a bond yield:

- The principal
- The coupon rates
- The maturity dates
- When the borrower issues bonds, an agreement is made between the borrower and the lender where the issuer of the bond promises to pay back the principal amount on the maturity date. The issuer also pays the interest on the money borrowed (Coupon) throughout the tenure.

Features of a Bond

- **Issue Date:** The issue date of bonds is the date from which the interest starts accruing.
- **Coupon Rate:** The interest rate at which a bond is issued, which the company is liable to pay to the investors is referred as the coupon rate. Coupon payments are made semi-annually or annually.
- **Maturity Date:** It is the date on which the issuer pays back the Bonds' face value to the investor. Before investing, check the maturity period of the Bond and invest as per your financial goal.
- **Taxation:** Certain Bonds provide tax benefits, while there are few corporate bonds that levy tax on their Bonds. Also, certain Bonds issued by the government, municipality Bonds, and a few more don't impose a tax on the profit earned.

Advantages of Bonds

- **Portfolio Diversification:** Diversification can provide you with better risk-adjusted returns. Also, diversification with bonds can help preserve capital for equity investors during times when the stock market is slump.
- **Lower Risk:** Bonds are long-term investment instruments with low-risk associated.
- **Fixed Return on investment:** Bonds pay interest at regular intervals and also, when Bonds mature, the investor receives the principal amount. In Bonds, the investor knows the exact return he/she will be getting.

Different types of Bonds

These can be divided by the rate, type of interest, or coupon payment.

- **Callable Bonds:** When a Bond issuer calls out his right to redeem the Bond even before it reaches its maturity, it is referred to as a Callable Bond. This option is exercised by the Bond issuer. An issuer can convert a high debt bond into a low debt bond.
- **Fixed-rate Bonds:** Bonds whose coupon rate remains the same through the course or tenure of the investment, it is referred to as Fixed-rate Bonds.
- **Floating-rate Bonds:** Bonds whose coupon rate vary during the tenure of the investment, then it is referred to as Floating-rate Bonds.
- **Zero Coupon Bonds:** Zero coupon bonds, When the coupon rate is Zero and the Bonds issuer pays only the principal amount to the investor on maturity. It is called Zero-coupon Bonds.
- **Puttable Bonds:** These are those Bonds where an investor sells their bond and get their money back before the maturity date, then it is called as Puttable Bonds.
- **What is YMT (Yield To Maturity)?** It is one of the ways through which one can price Bonds. It is the total of expected return for an investor if the bond is held till maturity. It is a long-term yield but represented as an annual rate

Topic 56. SECTORS OF ECONOMY

Important for subject: Economy

The economy is divided into the domestic economy and the rest of the world. The domestic economy comprises all resident economic units (entities).

Institutional (economic) unit is an economic entity capable, in its own rights, of institution owning assets; incurring liability engaging in economic activities and in transactions with other entities having a complete set of accounts.

There are three sectors of domestic economy:

- **General government sector includes** All departments, establishments, and bodies of its central and local governments located in its territory; the embassies, consulates, representations, military establishments of the particular country's general government located elsewhere.

- **The sub-sectors:** Central government, Regional government, Local government ,Social security funds
- **Real sector:** It consists of enterprises (nonfinancial corporations), households and nonprofit institutions serving households, in some cases combined into one subsector named "Other resident sector.

Individuals or groups of persons in the form of households:

- They share the same living accommodation; pool some or all of their resources, income and wealth; consume certain types of goods and services collectively and may engage in production activity.
- In the case of activity there is **no segregation** between the inventory of the enterprise created by the household and the owners' private inventory, i.e. such an enterprise is Important for subject to **unlimited liability.**
- **The four sub sectors:** Self-employed or entrepreneurs (employers), Own-account workers; Employees, Recipients of property and transfer income

Nonprofit Institutions Serving Households Sector

- This sector comprises noncommercial organizations engaged in production of non market goods and services.
- These goods and services are provided to individual households or to the entire community without charge or at prices that are not economically significant. The institutions that are controlled and financed mainly by government units are not included in this sector, since they are included into the general government sector.
- **Financial sector:** The financial sector can be divided into two major sectors: Financial intermediaries, and Financial auxiliaries.
- **Auxiliary financial activities:** Those corporations that engage in provision of auxiliary financial services are not financial intermediaries since they do not incur liabilities on their own account for acquiring financial assets, but provide services that are auxiliary to financial intermediation.
- **The corporations are:** Stock exchanges and organized foreign exchange and securities markets, Depositaries and clearing organizations, Brokers and dealers;
- Foreign currency exchange companies, Nonprofit institutions, Organizations dealing with

financial guarantees; Organizations dealing with financial derivatives, etc.

- **Financial intermediation** may be defined as a productive activity in which an institutional unit incurs liabilities on its own account to acquire financial assets through financial market transactions.

Topic 57. HAL OFFER FOR SALE OPENS TODAY

Important for subject: Economy

Offer For Sale (OFS)

It is a method that allows the promoter of a company to sell their shares to institutional and retail investors through exchanges.

IPO, OFS, and FPO – How are they different?

IPO

- Initial Public Offering is when a company is introduced into the publicly traded stock markets for the first time. In the IPO, the company's promoters choose to offer a certain percentage of shares to the public. The reason for going public and the process of an IPO is explained in detail in Chapters 4 and 5.
- The primary reason for going public is to raise capital to fund expansion projects or cash out early investors. After the IPO is listed on the exchange and is traded in the secondary market, promoters of the company might still want additional capital. There are three options available: Rights Issue, Offer for Sale and Follow-on Public Offer.

Rights Issue

- The promoters can choose to raise additional capital from its existing shareholders by offering them new shares at a discounted price (generally lower than Market Price). The company offers new shares in the proportion of shares already held by the shareholders.
- For example, a 1:4 Rights Issue would mean that every 4 shares held 1 additional share is offered. Although this option looks good, it limits the company to raise the capital from a small number of investors who are already holding shares of the company and might not want to invest more. A rights issue leads to the creation of new shares that are offered to the shareholders, which dilutes the value of the previously held shares.

OFS

- The promoters can choose to offer the secondary issue of shares to the whole market, unlike a rights issue restricted to existing shareholders. The Exchange provides a separate window through the stockbrokers for the Offer for Sale.
- The exchange allows a company to route funds through OFS only if the Promoters want to sell out their holdings and/or maintain minimum public shareholding requirements (Govt. PSU have a public shareholding requirement of 25%).
- There is a floor price set by the company, at or above which both Retail and Non-Retail investors can make bids. The shares are allotted, if bids are at a cut-off price or above will be settled by the exchange into the investor Demat account in T+1 days.

FPO

- An FPO also has the same intent of raising additional capital after it has been listed but follows a different mechanism for applying and allotting shares. Shares can be diluted, and fresh shares can be created and offered in an FPO. Just like an IPO, an FPO requires that Merchant Bankers be appointed to create a Draft Red Herring Prospectus which has to be approved by SEBI after which bidding is allowed in a 3-5 day period.
- Investors can place their bids through ASBA and shares are allotted based on the Cut-off Price decided after the book-building process. Since the introduction of OFS in 2012, FPOs are seldom used due to the lengthy approval process.
- The company decides on a Price Band, and the FPO is publicly advertised. Prospective investors can bid for the issue using the ASBA portal through Internet Banking or apply

offline through a Bank Branch. After the bidding process is complete, the cut-off price is declared based on the demand and the additional shares allotted are listed on the exchange for trading in the secondary markets.

- An example of an FPO is of Engineers India Ltd which underwent an issue in February 2014 with Rs 145-Rs 150. The issue was oversubscribed by 3 times. The shares on the day of the starting date of the issue were trading at Rs 151.1. The lower price band was at a 4.2% discount from the market price.

Difference between OFS and FPO

- An OFS is used to offload Promoters' shares while an FPO is used to fund new projects. Dilution of shares is allowed in an FPO leading to change in Shareholding structure while OFS does not affect the number of authorized shares.
- Only the companies with a Market Capitalization of Rs 1000 crores and above can use the OFS route to raise funds while all the listed companies can use the FPO option.
- Ever since SEBI has introduced OFS, FPO issues have come down, and companies prefer to choose the OFS route to raise funds

Topic 58. BE VIGILANT AGAINST INTEREST RATE RISK, FM TELLS BANKS

Important for subject: Economy

Amid fears of contagion effects from banking crises in the U.S. and Europe, **Finance Minister Nirmala Sitharaman has asked banks to remain vigilant about "interest rate risks" and undertake regular stress tests**, even as public sector bankers assured her all possible steps are being taken to safeguard themselves from any potential financial shock.

Sitharaman, also urged banks to **try attracting more deposits** now that the **government has reduced "the tax arbitrage in some debt instruments**", hinting at the Finance Bill changes to strip some of the tax benefits that are available to debt mutual funds from April 1.

Interest Rate Risk

- Interest rate risk is the **exposure of a bank's current or future earnings and capital to adverse changes in market rates.**
- Interest rate risk is the potential for investment losses that can be triggered by a move upward in the prevailing rates for new debt instruments.

- If interest rates rise, for instance, the value of a bond or other fixed-income investment in the secondary market will decline.
- The **change in a bond's price given a change in interest rates is known as its duration.**
- Interest rate risk is measured by a fixed income security's duration, with longer-term bonds having a greater price sensitivity to rate changes.
- Interest rate risk can be **reduced through diversification of bond maturities or hedged using interest rate derivatives.**

Topic 59. MARKET INDEX PROVIDERS

Important for subject: Economy

The Central Government recently put the onus of regulating the practices of market index providers on the Securities Exchange Board of India (SEBI).

Market Index

- A market index is a **hypothetical portfolio of investment holdings that represents a segment of the financial market.**
- The calculation of the **index value comes from the prices of the underlying holdings**.

Market Index Providers

- Index providers are those **institutions that formulate and manage indices.**
- One of the important roles of the index provider is **to classify and define markets**, as their indices represent a market or a proportion of a market and provide a benchmark of performance for that market or sector.
- They have the **responsibility to set the rules that decide what securities to include in each inde**x, **how the index will be managed and how securities will be added or removed** from that index over time.
- They also usually **determine how stocks can be classified**, e.g. is a particular stock a Healthcare or an Oil & Gas stock, or is it a Developed or Emerging market stock.
- An index allows investors and other stakeholders to get a snapshot of the market. S**&P Dow Jones, MSCI, and Bloomberg** are some of the **globally renowned institutions that provide indices.**
- **In India, this activity is generally carried out by subsidiaries of stock exchanges**. The most prominent indices in India are the **Nifty50 by NSE Indices** and **Sensex provided**

by a venture of S&P Dow Jones Indices and BSE Lied.

Current status of Regulation

- Currently, **index providers are outside the purview of SEBI**. However, **SEBI had issued** a **code of conduct for them in 2017.**
- Currently, exchange platforms and rating agencies offer index services which are widely used by mutual funds and insurance companies to track performance and offer ETFs and index funds.

New Regulatory Framework/Protocol

- All Index Providers (IP) offering services to Indians will **have to get themselves registered with SEBI**. However, **administrators providing benchmarks notified by the Reserve Bank of India will be excluded** from this mandatory requirement.
- The index provider should be a **legal entity incorporated under the Companies Act** in the country of origin, and independent professionals — individual or group of persons — providing index/benchmark services should be considered ineligible.
- IPs must have **net worth of at least Rs.25 crore**. IPs must **have at least a 5-year track record in index administration**. Alternatively, IPs should have at least two employees, each having minimum 5 years of relevant experience.
- IPs will have to constitute an oversight committee for reviewing existing index design and proposed changes to benchmark methodology. The committee will also oversee audit results and the implementation of audit observations.
- IPs will have to follow policies/procedures to manage conflicts of interest. IPs will have to prevent sharing and leakage of any sensitive information. IPs will have to **document their methodology for index calculation publicly**.
- IPs will have to **offer a grievance redressal mechanism including an online facility** for arbitration between the index provider and customer/client.
- Index providers will also "be **assessed by independent external auditors to evaluate adherence t**o [International Organization of Securities Commissions] principles **once in two years.**
- The proposed regulations require maintaining all audit records and making them available for SEBI when asked for. This ensures a high degree of governance and accountability from the index providers.

- SEBI proposes that the index providers need to consider all relevant data for creating an index.
- It also needs to exercise enough care and caution to ensure that there is no distortion of the data. It needs to exercise due diligence in the onboarding of data submitters.
- And, importantly, the index provider has to ensure that the data submitters source data from only regulated entities and no other sources.
- It ensures the quality and reliability of input materials used in constructing the index.

Topic 60. NO CHARGE ON NORMAL UPI PAYMENT : NPCI

Important for subject: Economy

The National Payments Corporation of India (NPCI) has introduced **interchange fees of up to 1.1 per cent on merchant UPI transactions done using prepaid payment instruments from April 1.**

The charge, **starting from 0.5 per cent** depending **on the MCC (merchant category code)**, will be **levied on UPI payments of over ₹2,000** made to online merchants, large merchants and small offline merchants.

Applicability of New norms

- The **new NPCI guidelines on wallet interoperability establish interchange fee for wallet usage**, which will be **paid to issuers of wallets** such as Paytm, PhonePe and Google Pay, among others.
- They also include charges for UPI-wallet-loading that will be paid by wallet issuers to remitter banks or the bank accounts from which the amount is being debited.

Impact on Wallet players

- The inter-operability norms will enable universal acceptance of wallets across all UPI QR codes and devices, thus increasing the salience or relevance of wallets.
- It will also ensure uniformity and parity by clearly defining the interchange fees on wallet payments as against the current practice of bilateral agreements between wallet issuers and payment platforms.

Interchange fees

- The interchange rates vary according to merchant category codes, in the range of 0.5 per cent to 1.1 per cent.
- Categories such as fuel, education, agriculture and utility payments attract a lower interchange of 0.5-0.7 per cent; convenience stories across food shops, specialty retail outlets and contractors, have the highest charge of 1.1 per cent.

Impact on Consumers

- The norms are expected to increase the appeal, scope, role and usability of wallets as they can now be used to make UPI payments across QR codes and devices, increasing payments alternatives for customers.
- As such, wallets are more convenient than UPI transactions owing to the facility of being able to load the wallet once to make multiple transactions rather than UPI code for every individual payment.
- Consumers will also be able to load their wallets from anywhere including credit or debit cards, BNPL (Buy Now Pay Later) and net banking, among others, thus creating a mechanism to use any instruments for UPI transactions, albeit directly or indirectly.

Will this make wallet transactions costlier?

- The interchange fees are paid by merchants to wallets or card issuers and are usually absorbed by merchants.
- Smaller merchants and shopkeepers are unlikely to be impacted as it is applicable only on payments of over ₹2,000.
- However, MDR (merchant discount rate or merchant transaction fees) is applicable on wallets-on-UPI in certain cases and this move may lead to higher MDRs imposed on merchants, depending on payment companies' ability and willingness to pass on the interchange.
- This may subsequently impact merchants' ability to absorb the higher costs which could ultimately be passed on to customers.

Does this mean consumers will be charged for UPI transactions?

- Introduction of **MDRs on all UPI merchant (P2M) transactions seems unlikely** at the moment as the **government has maintained that UPI is a 'public good'** and that it does not plan to introduce charges on UPI transactions.

- However, **loading of wallets for UPI transactions could cost more if wallet issuers decide to pass on the 15 bps interchange required to be paid to remitter banks for loads of over ₹2,000**

Topic 61. TOP 5 LARGE CONGLOMERATE MUST BE DISMANTLED

Important for subject :Economy

Former Deputy Governor of Reserve Bank of India Viral Acharya has suggested that the top five Indian conglomerates, including Mukesh Ambani backed Reliance group,

Tata Group, Aditya Birla Group, Adani Group, and Bharti Telecom be dismantled as their market dominance could be responsible for keeping core inflation persistently at a high level

What is crony capitalism?

- Crony capitalism is a term describing an economy in which success in business depends on close relationships between business people and government officials. It may be exhibited by favoritism in the distribution of legal permits, government grants, special tax breaks, or other forms of state interventionism.

What is core inflation?

Core Inflation:

- **Inflation excluding 'food and beverages' and 'fuel and light'** – the transitory components of the consumer price index.
- Conventionally, core inflation is **calculated by excluding 'food and beverages' and 'fuel and light' groups from overall inflation (CPI-C).**

Topic 62. RBI'S TIMELY MOVE TO RING-FENCE BANKS

Important for subject: Economy

Amid the rising spill over risks due to the recent spate of US bank failures and stress building up in Credit Suisse, the RBI rightly began specific actions to further strengthen banks. A forward outlook of RBI indicates that banks will be able to maintain capital to risk weighted assets ratio (CRAR) much beyond the minimum threshold even in severe stress scenario

CRAR

- Capital Adequacy Ratio (CAR) is the **ratio of a bank's capital in relation to its risk weighted assets and current liabilities**.
- It is decided by central banks and bank regulators **to prevent commercial banks from taking excess leverage and becoming insolvent in the process**. The **Basel III norms** stipulated a capital to risk weighted **assets of 8%.**
- However, **as per RBI norms, Indian scheduled commercial banks are required to maintain a CAR of 9%** while Indian public sector banks are emphasized to maintain a CAR of 12%.

Recapitalization

- Bank recapitalization, means **infusing more capital in state-run banks so that they meet the capital adequacy norms**.
- The government, using different instruments, infuses capital into banks facing shortage of capital.
- In compliance with RBI guidelines which are **based on Basel norms requiring banks to maintain certain amount of capital reserves,** the government, which is also the biggest shareholder, infuses capital in banks by either **buying new shares or by issuing bonds.**
- As the state-run banks were **struggling to deal with burgeoning** NPAs, the government from time-to-time kept on **announcing recapitalization to keep the banks afloat**.

Topic 63. SEBI DISCLOSURE NORMS

Important for subject: Economy

The Securities & Exchange Board of India (SEBI) mandated that **large listed companies must confirm or deny price-sensitive market rumours,** and **in the case of material board decisions disclose the same to the stock exchanges within 30 minutes**.

- To bring more transparency and to ensure timely disclosure of material events or information by listed entities, the SEBI board made it mandatory for **the top 100 listed companies by market capitalisation to verify, confirm or deny or clarify any market rumours.** This would come into **effect from October 1, 2023.**
- And in the case of **the top 250 listed entities by market capitalisation, the deadline to adhere to this norm would be April 2024.** The markets regulator has also made it mandatory for up streaming of clients' funds by stock brokers and clearing members to

Clearing Corporations.

Significance

- This move is aimed at protecting retail investors' funds in the secondary market.
- This will mitigate credit risk on intermediaries and risk of potential misuse of clients'.

Price Sensitive Information

- According to SEBI, **Price-sensitive information** means any information which relates, directly or indirectly, to a company and which if **published is likely to materially affect the price of securities of the company.**

Material Events

- A material event is when your company undergoes a change that would affect the share value of the business. Material events are pivotal situations or changes to the business that would dramatically shift the valuation (value) of the company.

Topic 64. DEEPENING GREEN TECH DIVIDE BETWEEN GLOBAL NORTH, SOUTH TO WORSEN ECONOMIC INEQUALITY, WARNS UN

Important for subject: International relations

Developed countries **benefit the most from green technologies** such as artificial intelligence, Internet of Things and electric vehicles and this can deepen global economic inequality, warned the United Nations Conference on Trade and Development (UNCTAD).

- **Developing countries may miss out on the economic opportunities** resulting from green technologies if governments and international bodies do not take decisive action.
- The **total exports of green technologies from developed countries jumped** to more than $156 billion in 2021 from about $60 billion in 2018, the report found. At the same time, exports from developing countries rose to only about $75 billion from $57 billion.
- According to the **'frontier technology readiness index'** included in this report, **only a few developing countries have the capacity needed to take advantage** of frontier technologies such as blockchain, drones and solar power.
- **Although developing countries are the least prepared** to use frontier technologies, **several economies in Asia have made important policy changes that have enabled**

them to perform better than expected according to their gross domestic product per capita.

- **India remains the greatest performer, ranking at 67 positions** better than expected, followed by the Philippines (54 positions better) and Vietnam (44 better).
- UNCTAD calls on governments in developing countries to align environmental, science, technology, innovation and industrial policies. It **urges them to prioritize investment in greener and more complex sectors, to provide incentives to shift consumer demand towards greener goods** and to boost investment in research and development.

United Nations Conference on Trade and Development

- UNCTAD stands for the United Nations Conference on Trade and Development, and is a **body of the United Nations system** that focuses on promoting economic development, particularly in developing countries.
- UNCTAD was **formed in 1964**, as part of the United Nations system. It was established to **promote economic development, particularly in developing countries, and to facilitate trade and investment.**
- The objectives of UNCTAD **include promoting international trade, reducing trade barrier**s, **supporting developing countries in their efforts to integrate into the global economy**, and fostering sustainable development.
- UNCTAD provides research, analysis, and technical assistance to developing countries, to help them improve their trade and investment policies. It also provides a **forum for dialogue between developed and developing countries** on trade and development issues.
- UNCTAD has **195 member states** and is headquartered in **Geneva, Switzerland.**
- UNCTAD **conducts research and analysis** on various trade and development issues, and publishes reports and policy recommendations. It also provides technical assistance and capacity building to developing countries, and organizes conferences and meetings on trade and development issues.
- UNCTAD **works closely with the World Trade Organization (**WTO) and **provides technical assistance to developing countries** in their WTO negotiations.

Flagship reports:

- Trade and Development Report

- World Investment Report
- The Least Developed Countries Report
- Economic Development in Africa Report
- Information Economy Report
- Technology and Innovation Report
- Review of Maritime Transport

Topic 65. ENERGY STORAGE HAS A VITAL ROLE TO PLAY IN THE GREEN TRANSITION OF BIMSTEC COUNTRIES

Important for subject: international relations

The growing energy demands in the emerging economies of countries in the region will require that the energy transitions in the region be resource-efficient and based on the timely need for energy.

- Energy storage systems **can store energy from variable sources such as solar and wind** until required, thereby allowing the integration of more renewable energy into the system. **They discharge when they release the energy back into the grid**.
- Storage technologies are **essential to replace fossil fuel-based generations** with 100 per cent renewable energy-based energy system sources. **Lithium-ion batteries are currently the predominant storage technology** solutions for largescale plants to ensure a reliable renewable energy source. It **should be costeffective and long-lasting** for renewable power — charging and discharging many thousand times.
- There are many storage techniques to address the issues of intermittencies of renewable energy systems, such as **compressed air storage, pumped hydroelectricity storage, advanced rail energy storage, stacked blocks, flywheels, lithium-ion battery storage,** liquid air energy storage, pumped heat electrical storage, redox flow batteries, superconducting magnetic energy storage and methane**.**
- BIMSTEC countries have **immense potential for regional grid balancing** in the context of large-scale renewable energy growth due to diversity in supply sources.
- For example, the **generation resources in Nepal and Bhutan are predominantly hydro**, and Myanmar has huge untapped hydropower potential.
- With the rise of power markets due to recent reforms in power markets in India and the development of ancillary service markets, **a market-based approach to regional grid**

balancing will become the preferred choice to manage the intermittency in the most economical manner in the BIMSTEC regional context.

- While there is **large potential of hydro energy** resources in the region, it is **important to develop these resources in a sustainable and environmentally friendly manner** with limited environmental degradation.

Pumped Hydroelectric Energy Storage:

- Pumped Hydroelectric Energy Storage (PHES) is a **form of energy storage that involves pumping water from a lower reservoir to a higher reservoir** during periods of low electricity demand.
- **Working Principle**: During periods of low electricity demand, **excess electricity is used to pump water from a lower reservoir to a higher reservoir**. When demand for electricity increases, the water is released from the higher reservoir, and flows back to the lower reservoir through turbines, generating electricity.
- PHES systems **can store large amounts of energy**, ranging from a few megawatts to several giga-watts.
- PHES is a **reliable and cost-effective method** of energy storage, with a long lifespan. It is **also environmentally friendly**, as it does not produce greenhouse gas emissions during operation.
- PHES is used **to balance the supply and demand of electricity**, and to provide backup power during emergencies. It is also **used to store excess energy** from renewable sources such as wind and solar power.
- PHES systems require **large amounts of land, water, and capital investment**.
- They may also have an impact on the environment and wildlife, particularly during the construction phase.
- Examples in India: Some examples of PHES in India are the Srisailam Dam in Andhra Pradesh, the Koyna Hydroelectric Project in Maharashtra, and the Tehri Dam in Uttarakhand.
- Future prospects: PHES is expected to play an **important role in the transition to renewable energy**, as it can store excess energy from wind and solar power. It is also expected to become more cost-effective in the future, as the technology continues to improve.

Topic 66. KERALA'S BID TO CAPTURE WILD JUMBO 'ARIKOMBAN'

Important for subject: International relations

People of Santhanpara and Chinnakanal panchayats in Idukki have been demanding the capture of Arikompan, which has a history of trampling ten people to death and destroying around 60 houses and shops.

- Kerala Forest Department has made sweeping arrangements **to capture a wild elephant terrorising**the high ranges of the Idukki district by killing people and raiding shops for grains for at least the last five years.
- The elephant, known as **Arikomban (rice tusker), a name conferred on the rogue elephant by local people** due to its habit of raiding shops for rice) would be tamed in the operation set to begin on March 25 and **converted into a kumki** (captive tusker used for operations against rogue elephants)
- The department has already begun **mobilising its four kumki elephants from Wayanad to Idukki to herd the tranquilised rogue** pachyderm to truck and later into a cage already constructed at the elephant training centre.
- Earlier this year, forest officials captured a **rogue elephant at the centre of mananimal conflict at Dhoni in Palakkad.** The rogue tusker, code-named Palakkad Tusker-7 (P-7), was shot with tranquiliser darts.

Reasons for the conflict:

- **Growing human/animal populations** overlap with established wildlife/human territory, creating a reduction of resources.
- **Fragmentation of habitats and corridors** due to legal and illegal changes in land use – clearances for mining or encroachment for agriculture.
- **Agricultural Expansion and Changing cropping patterns** that attract wild animals to farmlands.

Habitat degradation due to the growth of invasive alien species, etc.

- **Infrastructure development, Climate Change**, etc.

Human-Wildlife conflict management:

- **Understanding the conflict**: Research all aspects of the conflict profile to understand the context for conflict in any given situation (**hotspot mapping, community attitudes, spatial and temporal characteristics**, etc.)
- **Mitigation:** Reducing the impacts of HWC after it occurs (**compensation, insurance, alternative livelihoods**, etc.)
- **Response:** Addressing an on-going HWC incident (**response teams, reporting mechanisms, standard operating procedures,**)
- **Prevention**: Stopping or preventing HWC before it occurs **(fences, early detection tools, safe working environments,**)
- **Policy**: Enabling HWC management through protocols, principles, provisions, and measures stipulated in the legislation and undertaken by authorities (international and national law, national and local HWC management plans, spatial plans, etc.)
- **Monitoring**: Measuring the performance and effectiveness of HWC management interventions over time (**data collection, information sharing**, adaptive management, etc.)

Topic 67. EXERCISE COBRA WARRIOR

Important for subject: International Relations

Over the past three weeks, five Indian Air Force (IAF) Mirage2000 aircraft have been undertaking joint training involving high intensity, large force, and tactical air war fighting operations with six other Air Forces as part of the **multilateral 'Exercise Cobra Warrior' under way in the U.K.**

About the exercise:

- The **Exercise Cobra Warrior** is a **multilateral Air exercise in which Air Forces from Finland, Sweden, South Africa, the United States of America and Singapore would also be participating.**
- The exercise aims to participate in fighter aircraft engagements and learn from the best practices of various Air Forces.
- The IAF will be participating in the exercise with five Mirage 2000 fighters, two C-17 Globemaster III and an IL-78 mid-air refueller aircraft.

Other Joint Exercises between India and the UK:

1. Navy: Konkan
2. Air Force: Indradhanush
3. Army: Exercise Ajeya Warrior

Topic 68. IMF BAILOUTS

Important for subject :International Relations

The International Monetary Fund (IMF) confirmed a $3 **billion bailout plan for Sri Lanka's struggling economy**. Negotiations are also being held with Pakistan for a $1.1 billion bailout plan.

Reasons:

- Such currency crises are generally the **result of gross mismanagement of the nation's currency by its central bank**, often under the covert influence of the ruling government. Central banks may be forced by governments to **create fresh money out of thin air to fund populist spending.**
- Such spending eventually results in a **rapid rise of the overall money supply**, which in turn **causes prices to rise across the economy** and the **exchange value of the currency to drop.**
- A country's **domestic economic policies can also have an adverse impact on its currency's exchange rate and foreign exchange reserves**. For example, economic policy that imperils productivity can affect a country's ability to attract the necessary foreign exchange for its survival.
- Bad luck can also contribute to a crisis. In the case of Sri Lanka, a decrease in foreign tourists visiting the country led to a steep fall in the flow of U.S. dollars into the nation.

Impact:

- A rapid, **unpredictable fall in the value of a currency can destroy confidence in said currency** and **affect economic activity** as people may turn hesitant to accept the currency in exchange for goods and services.
- Foreigners may also be **unwilling to invest in the economy** where the value of its currency gyrates in an unpredictable manner.

- In such a scenario, **many countries are forced to seek help from the IMF to meet their external debt and other obligations**, to purchase essential imports, and also to prop up the exchange value of their currencies.

How does the IMF help countries ?

- The **IMF basically lends money**, often in the **form of special drawing rights** (SDRs), to troubled economies that seek the lender's assistance
- The IMF carries out its lending to troubled economies through a number of lending programs such as: the **extended credit facility**, the **flexible credit line**, the **stand-by agreement**, etc.
- Countries receiving the bailout can use the SDRs for various purposes depending on their individual circumstances. Any money that they receive from the IMF is likely to go towards addressing these urgent issues.

Conditions attached to an IMF bailout:

- A country may have to agree to **implement certain structural reforms** as a condition to receive IMF loans.
- The IMF's conditional lending has been controversial as many believe that these **reforms are too tough on the public**.
- Some have also accused the IMF's lending decisions, which are taken by officials appointed by the governments of various countries, to be influenced by international politics.
- Supporters of the IMF's lending policies, however, have argued that conditions are essential for the success of IMF lending. For one, countries that seek an IMF bailout are usually in a crisis due to certain policies adopted by their governments that turned out to be inimical to economic growth and stability.
- Corruption is another issue. The IMF lending to troubled economies, may turn out to be a wasted effort because these economies have poor institutions and suffer from high corruption.

Special Drawing Rights

- The SDR is an **international reserve asset**, created by the **International Monetary Fund** (IMF) in 1969 to **supplement its member countries' official reserves**.

- The SDR is **neither a currency nor a claim on the IMF**. Rather, it is a potential claim on the freely usable currencies of IMF members. SDRs can be exchanged for these currencies.
- The value of the SDR is calculated from a weighted basket of major currencies, including the U**.S. dollar, the euro, Japanese yen, Chinese yuan, and British pound**.
- The interest rate on SDRs or SDR is the interest paid to members on their SDR holdings.

Topic 69. US AND JAPAN TO SIGN PACT ON CRITICAL MINERAL SUPPLY CHAIN FOR EVS REQUIREMENT

Important for subject: International relations

Japan and the United States have **reached an agreement on trade** in **critical minerals for electric vehicle batteries,** part of an effort to diversify supply chains and reduce reliance on China for strategically important resources.

- The US and Japan will **boost cooperation on critical mineral supply** chains as inorder to counter **China's dominance in the electric vehicle battery industry.**
- Following the pact, **electric vehicles that use materials that have been collected or processed in Japan will be eligible for EV tax breaks** under the **US Inflation Reduction Act,**
- It is a **similar to an agreement Washington** has been negotiating with the **European Union** which would extend access to some of the as much as **$369 billion in handouts and tax credits** available over the next decade under the IRA, in areas including wind, solar and electric vehicles

What is Inflation Reduction Act (IRA):

- The Inflation Reduction Act of 2022 (IRA) is a **landmark United States federal law** which **aims to curb inflation** by **reducing the deficit, lowering prescription drug prices, and investing into domestic energy** production while promoting clean energy.
- It is a **reduced version** of the Biden administration's proposed **Build Back Better Act.** The legislation **stands to be the single largest investment in climate and energy** in the U.S. to date.

Topic 70. HONDURAS

Important for subject : International Relations

China and Honduras signed a **landmark communique to formally establish diplomatic relations,** with the **Central American nation becoming the latest country to switch recognition from Taipei to Beijing**.

- The agreement now leaves a dwindling number of diplomatic partners for Taiwan, with Honduras joining Nicaragua, Panama and Costa Rica in recently recognising Beijing and ending ties with Taipei.
- The only remaining among the 193 member countries of the UN that maintain diplomatic relations with Taiwan, along with the Holy See (Vatican), are the
- **Marshall Islands, Nauru, Tuvalu, and Palau in the Pacific; Eswatini in Africa; and Belize, Guatemala, Haiti, Paraguay, St. Lucia, Saint Vincent and the Grenadines, and Saint Kitts and Nevis, in Latin America and the Caribbean.**

One China policy

- One China policy is the **diplomatic acknowledgement of China's position that there is only one Chinese government and that Taiwan is an inalienable part of China's territory**.
- Any country that wants diplomatic relations with mainland China must break official ties with Taiwan.
- Taiwan is **not recognised as an independent country** by much of the world **not even the United Nations.**
- It undergoes extraordinary naming contortions just to participate in events and institutions like the Olympic Games and the World Trade Organization.
- **India has followed a "One China policy" since its recognition of China** (also known as the People's Republic of China) in 1949, and **only maintains trade and cultural relations with Taiwan.**
- Though U.S. agrees with a one-China policy, it said, it will intervene militarily if China will try to annex Taiwan by force.
- Under the policy, the **US recognises and has formal ties with China rather than the island of Taiwan**, which China sees as a breakaway province to be reunified with the

mainland one day including with the use of force.

How did it come about?

- The policy can be traced back to 1949 and the end of the Chinese civil war. The defeated Nationalists, also known as the Kuomintang, retreated to Taiwan and made it their seat of government while the victorious Communists began ruling the mainland as the People's Republic of China.
- Both sides said they represented all of China. Since then, China's ruling Communist Party has threatened to use force if Taiwan ever formally declares independence, but it has also pursued a softer diplomatic track with the island in recent years.

Taiwan Strait

- **Taiwan Strait, also called Formosa Strait,** is the arm of the Pacific Ocean, lying between the **coast of China's Fukien province and the island of Taiwan** (Formosa). The strait extends from southwest to northeast between the **South and East China seas.**
- It contains the **Pescadores Islands** (which are controlled by the government of Taiwan).

About Honduras

- The Republic of Honduras is a **country of Central America** situated between **Guatemala and El Salvador to the west and Nicaragua to the south and east.**
- The Caribbean Sea washes its northern coast, the Pacific Ocean its narrow coast to the south. It was home to **several important Mesoamerican cultures, most notably the Maya**, before the Spanish Colonization in the sixteenth century.
- More than **three-fourths of the land area of Honduras is mountainous**, lowlands being found only along the coasts and in the several river valleys that penetrate toward the interior.
- A large **undeveloped lowland jungle**, **La Mosquitia lies in the northeast**, and the heavily populated lowland Sula valley in the northwest.
- In **La Mosquitia lies the UNESCO world-heritage site Río Plátano Biosphere Reserve**, with the **Coco River which divides Honduras from Nicaragua**.
- It is known for its **rich natural resources, including minerals, coffee, tropical fruit, and sugar cane, as well as for its growing textiles industry,** which serves the

international market.

Northern Triangle

- The countries **of El Salvador, Guatemala and Honduras** are known as **Northern Triangle.**
- These countries **share a border tripoint at Trifinio biosphere reserve**, and also aspects of classical cultures, history, society, and politics.

Topic 71. DEPLETED URANIUM MUNITIONS

Important for subject : International Relations

The U.K. would provide Ukraine with **armour-piercing rounds containing depleted uranium.**

Depleted Uranium Munitions

- Depleted uranium (DU) is a **by-product of uranium enrichment.**
- **Enriched uranium is highly radioactive** and is used in nuclear reactors and nuclear weapons. In comparison to enriched uranium**, depleted uranium is much less radioactive and is incapable of generating a nuclear reaction.**
- Due to its **high density (more dense than lead**), **depleted uranium is widely used in weapons as it can easily penetrate armour plating.**
- The US began manufacturing armour-piercing rounds with depleted uranium in the 1970s and has since added it to composite tank armour to strengthen it.
- About 340 tons of depleted uranium were used in munitions during the 1991 Gulf War, and an estimated 11 tons in the Balkans in the late 1990s.
- Such rounds were developed by the U.S. during the Cold War to destroy Soviet tanks, including the same T-72 tanks that Ukraine now faces in its push to break through a stalemate in the east.

Weapons

- The **US, Britain, Russia, China, France and Pakistan** produce **uranium weapons**.
- Depleted uranium munitions are **not classified as nuclear weapons**, as per the **International Coalition to Ban Uranium Weapons**.

- Still they emit low levels of radiation, mainly **α-particles and can cause severe diseases.**

Risks

- Ingesting or inhaling them depresses renal function and raises the risk of developing a range of cancers.
- Depleted uranium munitions which miss their target can poison groundwater and soil.

Topic 72. PM VISHWAKARMA KAUSHAL SAMMAN (PMVIKAS)

Important for subject: Schemes

Prime Minister Vishwakarma Kaushal Samman (PM-VIKAS) scheme has been announced for traditional artisans and craftsmen in the budget 2023-24. A package of assistance has been conceptualized for encouraging traditional arts and handicrafts.

- It will enable the country's artisans to improve the quality, scale, and reach of their products, integrating them with the Micro, Small and Medium-scale Enterprises (MSME) value chain
- To help the artisans to improve their products' quality, scale, and reach by providing financial support, advanced skill training in modern digital techniques, and efficient green technologies and thereby integrating them with local and global markets through the Micro, Small and Medium Enterprises (MSME) value chain linkage

The components of the scheme will include access to Financial support

- Access to advanced skill training to increase the calibre
- Knowledge of modern digital techniques and efficient green technologies
- Brand promotion
- Linkage with local and global markets
- Digital payments
- Social security

Topic 73. SCHEMES AND PROGRAMMES TO ATTRACT YOUTH IN AGRICULTURE

Important for the subject : schemes

Schemes/ programmes to attract youth towards agriculture and other related industries and for the development of entrepreneurship: D**epartment of Agriculture & Farmers Welfare (DA&FW), Ministry of Agriculture & Farmers Welfare**, implements:

- Establishment of Agri-Clinics and Agri-Business Centers (AC&ABC)
- Skill training programmes (minimum 200 hours' duration) for Rural Youth and Farmers including women farmers
- Skill Training of Rural Youth (STRY)
- Sub Mission on Agricultural Mechanization (SMAM)
- Remunerative Approaches for Agriculture and Allied Sectors Rejuvenation (RKVYRAFTAAR) to promote Agri-Startups
- Certified Farm Advisor/Certified Livestock Advisor program
- Post Graduate Diploma in Management (Agri Business Management) [PGDM (ABM)]

Department of Agricultural Research and Education (DARE) through Indian Council of Agricultural Research (ICAR) implements the following

- Technology Assessment and Demonstration for its Application and Capacity Development through Krishi Vigyan Kendras (KVKs).
- Attracting and Retaining Youth in Agriculture (ARYA)

Ministry of Skill Development and Entrepreneurship

- Various initiatives implemented through Agriculture Skill Council of India (ASCI), a subsidiary under Ministry of Skill Development and Entrepreneurship are furnished below:
- Entrepreneurship training
- Apprenticeship program
- Vocationalization of School Education
- Vocationalization of Higher Education (UGC affiliated Colleges)

The Banks and Lending Institutions

- The loan to farmers including youth for various activities of agriculture & allied sectors like crop loan, infrastructure creation through Agri Infrastructure Fund (AIF),
- Kisan Credit Card (KCCs), value addition entrepreneurships under Pradhan Mantri Formalization of Micro Enterprises (PM FME), Farmer Producer Organization (FPOs), Self Help Group (SHGs) etc
- During 2022-23, the Government has increased the agricultural credit target to Rs. 18.00 lakh crore from Rs. 16.50 lakh crore during 2021-22.

Topic 74. INSTITUTION OF EMINENCE SCHEME

Important for subject: Schemes

The institutes of eminence scheme under the Union human resource development (HRD) ministry aims to project Indian institutes to global recognition.

The selected institutes will enjoy complete academic and administrative autonomy. The selection shall be made through challenge method mode by the Empowered Expert Committee constituted for the purpose.

Grant: The public institutions under IOE tag will receive a government grant of 1,000 crore, while the private institutions will not get any funding under the scheme.

Criteria

- **Global/National Ranking:** Only those institutions which have appeared in any of the global/national ranks shall be recommended for the IoE status.
- Public institutions are assessed on the basis of QS-2020 world rankings, in case of a tie QS- 2019 rankings are used.
- Private institutions are assessed on the basis of their ranking in the QS India or National Institution Ranking Framework (NIRF), the NIRF ranking being used as a tie-breaker.
- Any institution that did not appear in any rankings (QS-2019, QS-2020 and NIRF) is excluded completely from the list of IOE tag.
- **Greenfield Proposals:** Only after exhausting the above criterion, if any slot remains vacant, consideration shall be given to yet to be established (Greenfield) proposals.
- The term greenfield project generally refers to the initiation of a project without the need

to consider any prior work.

- The Greenfield Institutions would get 3 year period to establish and operationalise the institution, and thereafter, EEC will consider giving IoE status to such institutions.
- Satya Bharti Foundation (telecom major Airtel's philanthropic arm) became the second greenfield institution to be given IoE status, after Reliance's Jio Institute.

Topic 75. PRICES OF ESSENTIAL MEDICINES SET TO SEE A HIKE FROM APRIL1

Important for subject: Schemes

The prices of about 384 essential medicines and over 1,000 formulations are likely to witness an increase of over 11%, due to a sharp rise in the Wholesale Price Index (WPI). The yearly **increase in the prices of medicines listed in the National List of Essential Medicines (NLEM) is based on the WPI.**

- The price surge is expected for various routine and essential drugs such as painkillers, anti-infection drugs, cardiac drugs, and antibiotics.
- 8/18The **National Pharmaceutical Pricing Authority** (NPPA) announced that the annual change in WPI was 12.12% for the calendar year 2022.
- Every year, the NPPA announces a change in the Wholesale Price Index (WPI) in accordance with the Drugs (Price Control) Order, 2013.
- Experts have pointed out that the latest WPI figures are the highest seen since the DPCO 2013 came into force and this is the second consecutive year that the WPI is more than the annual permitted price hike for non-scheduled formulations (10%).
- Experts have also raised concerns as such a drastic increase in the prices would distort the accessibility and affordability of essential medicines.
- However, Health Ministry officials believe that the price increase will ensure that there would be no shortage of medicines in the market, and that manufacturers and consumers mutually benefit.
- It was previously seen that when a 10% increase was allowed, various manufacturers kept the rate under 5% because of market forces and a similar trend is expected.

National List of Essential Medicines

- The **National List of Essential Medicines (NLEM**) is a **list released by the Ministry of**

Health and Family Welfare.

- The medicines **listed in the NLEM are sold below a price ceiling fixed by the National Pharmaceutical Pricing Authority (NPPA). NPPA caps medicine prices and changes only based on wholesale price index-based inflation.**
- In India, it was framed on the lines of the Essential Medicines List (EML) released by the WHO.
- The Ministry of Health and Family Welfare prepared and released the first National List of Essential Medicines of India in 1996 consisting of 279 medicines. This list was subsequently revised in 2003, 2011, 2015 and 2022.

Purpose:

- Guide safe and effective treatment of priority disease conditions of a population. Promote the rational use of medicines. Optimize the available health resources of a country. It can also be a guiding document for:
- State governments to prepare their list of essential medicines Procurement and supply of medicines in the public sector.

Criteria for a Medicine to be Included in NLEM

Several factors are looked at before including a drug in the NLEM. These are:

- **Essentiality:** A medicine may be essential considering the population at large and should fit into the definition mentioned earlier.
- **Changing disease burden**: With time, the disease burden keeps changing in the country. At one point, TB might be more important to tackle. At the next moment, another disease like Covid-19 may become more important. So, the prevalent disease is considered while preparing the list.
- **Efficacy and Safety**: The medicine must have "unequivocal" evidence of efficacy and wider acceptance based on its safety to be included in the list.
- **Cost-Effectiveness**: The total price of the treatment must be considered while including the drug in NLEM. Only unit price may not be the best benchmark for this.
- **Fixed Dose Combinations (FDCs)**: The single-dose medicines are considered for inclusion in NLEM. FDCs are only included if they have a proven advantage concerning the therapeutic effect.

- **Turnover:** High sales turnover alone is not considered a good benchmark for inclusion in the NLEM. Other factors are also required to be essentially considered for it.

When is a Medicine Deleted from NLEM?

- A **drug is deleted from the list if it gets banned** in India. Also, it is removed if reports of concerns about drug safety emerge. If medicine with better efficacy or favourable safety profile and better cost effectiveness is now available, then it is removed from NLEM.

Topic 76. VAIKOM SATYAGRAHA

Important for subject : History

Tamil Nadu Chief Minister announced that the government was planning year-long events to commemorate the Vaikom Satyagraha that was launched to end caste discrimination in a local temple a century ago.

Vaikom Award

- The **award would be given to eminent personalities** or organisations that **worked for the welfare of oppressed sections beyond the State borders.**
- It would be **awarded on Periyar E.V. Ramasamy's birth anniversary on September 17,** which is also being **observed as Day of Social Justice by Tamil Nadu.**
- **Periyar was among the leaders** who took part in the movement and went on to earn the title '**VaikomVeerar**'.
- **About Vaikom Satyagraha Vaikom Satyagraha, from 30 March 1924 to 23 November 1925**, was a non **violent agitation for access to the prohibited public environs of the Vaikom Temple** in the Kingdom of Travancore.

Causes

- Kingdom of Travancore was known for its rigid and oppressive caste system and hence Swami Vivekananda called Travancore a "lunatic asylum".
- The campaign, led by Congress leaders T. K. Madhavan, K. Kelappan and K. P. Kesava Menon, was noted for the active support and participation offered by different communities and a variety of activists.
- Most of the great temples in the princely state of Travancore had for years forbidden

lower castes (untouchables) not just from entering, but also from walking on the surrounding roads.

The movement

- The agitation was **conceived by the Ezhava Congress leader and a follower of Sri Narayana Guru, T. K. Madhavan.**
- It demanded the right of the Ezhavas and 'untouchables' to use roads around the Vaikom Temple.
- Mahatma Gandhi himself visited Vaikom in March, 1925.

Reach of the movement

- The movement was **backed by Gandhiji, ChatampiSwamikal, and Sree Narayana Guru**.
- Prominent Leaders in Kerala such as T. **Madhavan, K.P. Kesava Menon and George Joseph launched the movement.**
- **Periyar and KovaiAyyamuthu from Tamil Nadu** worked in tandem with leaders in Kerala despite facing repressive action.
- The campaign gained popularity throughout India, and supporters arrived from around the country.
- Punjab's Akalis helped by establishing kitchens to feed the Satyagrahis. Even Muslim and Christian authorities backed the initiative.

Impact

- Travancore government eventually constructed new roads near the temple for the use of lower castes.
- The roads, however, kept the lower castes adequately away from the near environs of the Vaikom Temple and the temple remained closed to the lower castes.
- After the **intervention of Mahatma Gandhi, the agitation was given up and a compromise reached with Regent Sethu Lakshmi Bayi who released all those arrested and opened the north, south and west public roads leading to Vaikom Mahadeva Temple to all castes. Only in 1936, after the Temple Entry Proclamation**, was access to the eastern road and entry into the temple **allowed to the lower castes.**

- Vaikom Satyagraha markedly brought the method of nonviolent public protest to Kerala.
- This was the first time in Kerala that an organised effort for the fundamental rights of untouchables and other backward castes was carried out on such a large scale. It became India's principal human rights campaign.
- The Satyagraha movement became a trial ground for significant methodologies such as Satyagraha.
- It instilled reason in the people.

Topic 77. GOVT WILL ATTEMPT TO OPEN CORRIDOR TO SHARDA PEETH IN POK FOR DEVOTEES

Important for subject: History

Sharada Peeth is a **ruined Hindu temple** and **ancient centre of learning** located in the **Neelum Valley of Pakistan Occupied Kashmir**.

- It is situated in the **valley of Mount Harmukh, believed by Kashmiri Pandits to be the abode of Shiva.**
- Sharada Peeth translates to "**the seat of Sharada**", the Kashmiri name for the Hindu **goddess Saraswati.** "Sharada" could be also related to the proto-Nostratic terms "sarv", which means "flow or stream", and daw (blow, tip or rock), because it was located at the confluence of three streams.

It was **probably commissioned by Lalitaditya Muktapida** though **no definitive evidence exists in favor.**

- **Al-Biruni recorded the place for the first time**, as a revered shrine housing a wooden image of Sharda — however, he had never ventured into Kashmir and based his observations on hearsay.

Location:

- It is located in the **village of Sharda in the valley of Mount Harmukh, along the Neelam River** in the Pakistani-administered territory of Azad Kashmir. It lies 16 miles to the northwest of the Line of Control.
- **As a Centre of Learning**: Between the **6th and 12th centuries CE, it** was one of the foremost centres of higher learning, **hosting scholars such as Kalhana, Adi Shankara,**

and Vairotsana.

- It is also said to be where Paṇini and Hemachandra completed and stored their ṇ writings on Sanskrit grammar.

Religious significance:

- Sharda is the most **revered religious place for Kashmiri Pandits**. They believe that Sharada in Kashmir is a tripartite embodiment of the goddess Shakti: Sharada (goddess of learning), Saraswati (goddess of knowledge), and Vagdevi (goddess of speech).
- It is **one of the 18 Maha Shakti Peethas throughout South Asia** that commemorate the location of fallen body parts of the Hindu deity Sati.

Topic 78. IBISBILL

Ibisbill, the poorly understood Himalayan water bird faces threats, finds study. Experts say that unlike other riverine birds, the **ibisbill nests in small islands of the third-order streams** (waterways in the upper reaches of the watershed) being interrupted with boulders and pebbles.

- In India, the **bird has been recorded in Jammu and Kashmir, Ladakh,** pockets of Uttarakhand and Sikkim, and a few sites in northeast India. A recent two-year study published in 2022 has documented **several threats faced by the species at six sites along the high-altitude** Sindh River in Ganderbal district of Central Kashmir.
- The findings revealed that **sand and boulder mining was the most prevalent** disturbance (38%), followed by **human presence (37%), livestock grazing (12%).**

Ibisbill:

- Ibisbill is a medium-sized bird found in mountain streams and rivers in South Asia. Ibisbill is the **only member of the family Ibidorhynchida**e and the genus Ibidorhyncha. It is **considered to be a "living fossil"** because it is the only surviving member of its family, which dates back to the Paleogene period, about 60 million years ago.
- Ibisbill has a **distinct appearance with a long, down-curved bill, grey-brown plumage**, and a white belly. It has a **striking black and white pattern** on its wings and tail, and its legs are pinkish.
- **Habitat**: Ibisbill is a bird of **high-altitude mountain streams and rivers**. It is found in

the **Himalayan region**, from Afghanistan to Bhutan, and **also in the mountainous areas** of **central and western China**.

- Ibisbills have **several adaptations** that enable them to live in their high-altitude riverine habitat. For example, their **long, down-curved bill** helps them to forage for food among the rocks and pebbles, while their **pinkish legs provide good camouflage against the rocky streambeds**.
- **Feeding habits**: Ibisbill **feeds on aquatic invertebrates** such as insects, snails, and crustaceans, which it picks from the rocks and pebbles in the riverbeds. It is also **known to feed on fish and small amphibians.**
- Ibisbills are **solitary birds and are usually seen alone or in pairs**. They are active during the day and are known for their distinctive calls, which are loud and farcarrying.
- **Breeding**: Ibisbill **breeds in the summer months**, and its breeding habitat **is usually on small rocky islands or gravel bars** in fast-flowing streams. The female lays a clutch of 2-3 eggs, which are incubated by both parents for about 4 weeks.
- **Cultural significance**: In some local cultures, Ibisbill is considered to be a **sacred bird and is associated with the Hindu deity Lord Vishnu**. It is also mentioned in the traditional folk songs and stories of some Himalayan communities.
- **Conservation status**: they are listed as a species of **'Least Concern'** in the IUCN Red List of Threatened Species.