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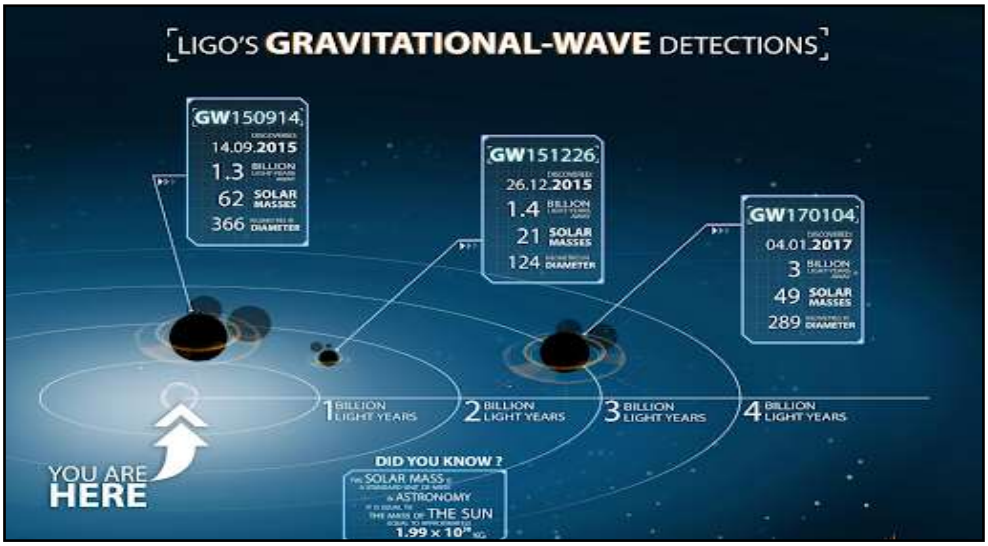
PIONEER ACADEMY's
PATHFINDER
CURRENT AFFAIRS FOR CIVIL SERVICES

Topic 1. LIGO INDIA PROJECT

Important for subject : Science and technology



The government has given the final go-ahead to India's Laser Interferometer Gravitational-Wave Observatory, or LIGO, project.

LIGO India Project

- **LIGO is an international network of laboratories that detect the ripples in spacetime** produced by the movement of large celestial objects like stars and planets.
- **LIGO-India will** be located in **Hingoli district of Maharashtra**, about 450 km east of Mumbai, and is scheduled to begin scientific runs from 2030.
- **LIGO (Laser Interferometer Gravitational-Wave Observatory)**
- It is an international network of laboratories meant to detect gravitational waves.
- Under this, two large observatories (~ 3000 Km apart) were built in the US (Hanford Site, Washington and Livingston, Louisiana) with the aim of detecting gravitational waves by laser interferometry.
- **Interferometry is a technique which uses the interference of superimposed waves to extract information.**
- Besides the **US,** such gravitational wave observatories are currently operational in **Europe and Japan**.
- **LIGO-India will be the fifth**, and **possibly the final node of the planned network**.

Why is a Fifth LIGO Observatory Needed?

- Extremely low strength of gravitational waves make their detection very difficult.
- Therefore, LIGO-India is part of the plan to expand the network of gravitational wave observatories in order to increase the chances of detecting these waves from anywhere in the observable universe.
- This will improve the accuracy and quality of information taken from them.

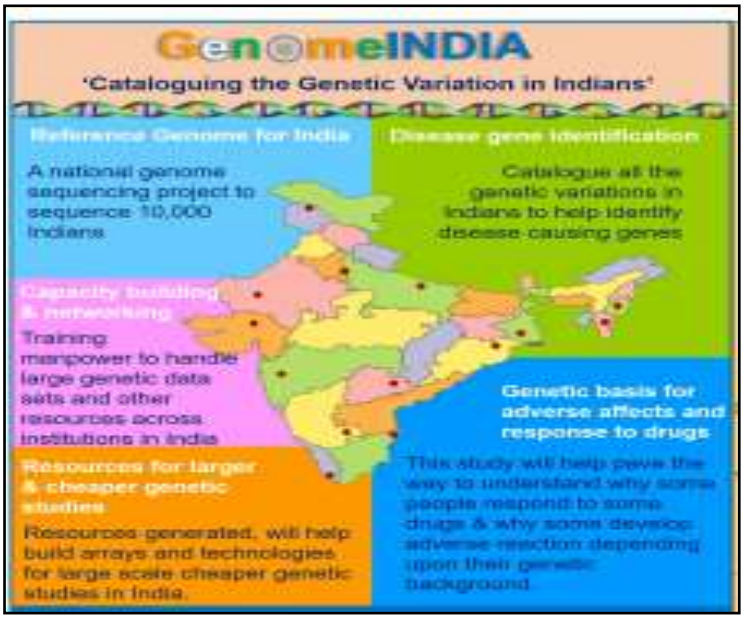
Gravitational Waves

- These are the **ripples in space-time produced by the movement of large celestial bodies like stars and planets.**
- These were postulated **over 100 years ago in Albert Einstein's General Theory of Relativit**y that encapsulates the current understanding of how gravitation works.
- However, they **were first discovered in 2015 by two LIGOs based in the United States.**
- In 2017, this experimental verification of the century-old theory received the Nobel Prize in Physics (to Rainer Weiss, Barry C. Barish and Kip S. Thorne).
- Until now, at least 10 events producing gravitational waves have been detected. **Significance for India**
- For India, LIGO is a momentous milestone. **India has been an active collaborator in a number of international science projects.**
- These include the **Large Hadron Collider experiments, and ITER, the effort to create a thermonuclear react**or that would enable controlled nuclear fusion reactions.
- India is also expected to be a partner country in setting up the next space station after the current International Space Station comes to the end of its life later this decade.
- However, **India has not yet built a cutting-edge scientific facility on this scale on its own soil, something that can have huge spin-off benefits for its science and technology sector**.
- The India-based Neutrino Observatory, one such facility that has been planned in India, has been facing delays.
- LIGO, therefore, is **crucial to demonstrating India's intent and capability to pull off complex science projects o**n its own.
- The new Ligo observatory, in combination with its partners, will let scientists probe

deep questions about black holes and neutron stars. "The new detector will improve chances of doing science in India.

Topic 2. GENOME INDIA PROJECT

Important for subject : Science and technology



Recently, the secretary of the Department of Biotechnology said that under the Genome India project, close to 7,000 genomes have been sequenced and 3,000 of these are already available for public access.

Genome India Project

- Taking inspiration from the Human Genome Project, the Department of Biotechnology (DBT) initiated the ambitious "Genome India Project" (GIP) on 3rd January 2020. It is a Central Sector Project.
- The GIP aims to **collect 10,000 genetic samples from citizens across India, to build a reference genome**.
- This is a mission-mode, multi-institution consortium project, the first of its kind in India supported by the Department of Biotechnology, Government of India.

Goal

- The goal of the research is to develop predictive diagnostic indicators for several high-priority diseases and other uncommon and genetic disorders.

- In phase 2, the project would collect genetic samples from patients with three broad categories – cardiovascular diseases, mental illness, and cancer.
- Through whole-genome sequencing, the plan is to build an exhaustive catalogue of genetic variations for the Indian population.

Targeted areas

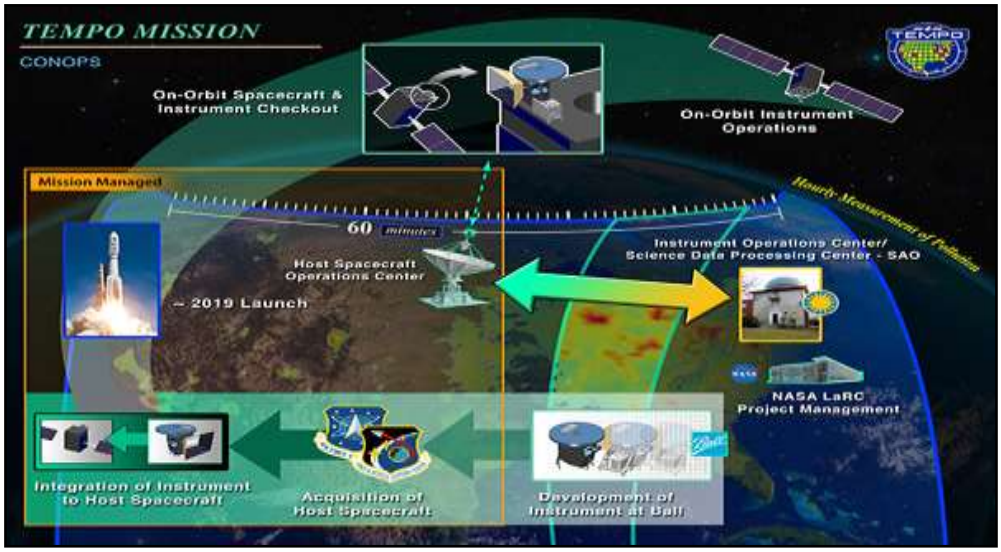
- Some of the priority areas are Precision health, Rare genetic disorders, Mutation spectrum of genetic and complex diseases in the Indian population, Genetic Epidemiology of Multifactorial Lifestyle Diseases, and Translational Research.

What is a genome?

- Every organism's genetic code is **contained in its Deoxyribose Nucleic Acid (DNA),** the building blocks of life. A **genome, simply put, is all the genetic matter in an organism.**
- It is defined as "**an organism's complete set of DNA, including all of its genes**.
- Each genome contains all of the information needed to build and maintain that organism. In humans, a copy of the entire genome — more than 3 billion DNA base pairs — is contained in all cells that have a nucleus".

Topic 3. TROPOSPHERIC EMISSIONS: MONITORING OF POLLUTION (TEMPO) INSTRUMENT

Important for subject : Science and technology



About TEMPO

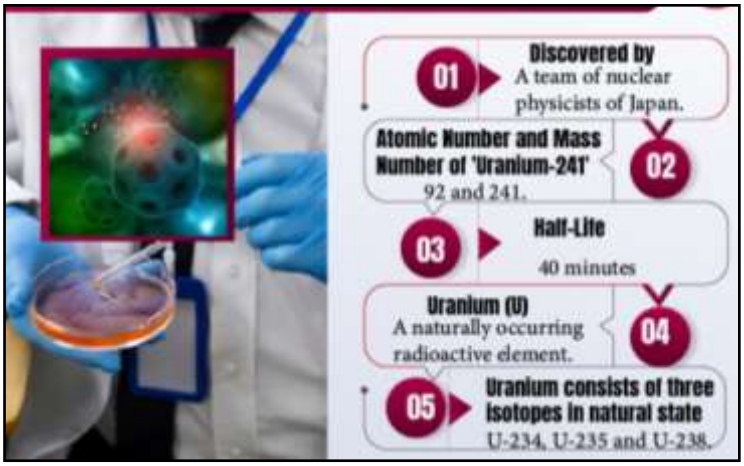
- The **Tropospheric Emissions: Monitoring of Pollution (TEMPO) instrument** was launched by NASA in a Falcon 9 rocket.
- The **instrument will measure pollution and air quality across greater North America** on an **hourly basis during the daytime**.
- TEMPO will have multiple applications measuring levels of various pollutants providing air quality forecasts helping the development of emission-control strategies **Existing pollution-monitoring satellites are in low Earth orbit (LEO), but TEMPO will be hosted in geostationary orbit.**
- TEMPO will allow **scientists to monitor air pollutants and their emission sources from space more comprehensively than before.**
- A **geostationary orbit is 36,000 kilometers above the equator**, where the **orbiting satellite will match the rotation of the Earth. (**meaning it will stay over the same location)

Similar Instruments

- TEMPO will be part of a constellation of instruments measuring air quality over the Northern Hemisphere which includes the **European Space Agency's Sentinel-4** (under development) and **South Korea's Geostationary Environment Monitoring Spectrometer.**

Topic 4. NEW URANIUM ISOTOPE

Important for subject : Science and technology



A team of nuclear physicists affiliated with multiple institutions in Japan, working with a

colleague from Korea, has **discovered a previously unknown uranium isotope with atomic number 92 and mass 241.**

The group forced the isotope to reveal itself and tested the results of their efforts to show that what they had found was **indeed uranium-241.**

Details of the Finding

- In this new effort, the research team tried a new approach—**they fired a sample of unranium-238 nuclei at a sample of platinum-198 nuclei** using an isotope separation system.
- Such interactions are known to result in multinucleon transfer, in which isotopes swap neutrons and protons. The collision resulted in the creation of a large number of fragments, which the researchers studied to determine their makeup.
- They found evidence of 19 heavy isotopes holding from 143 to 150 neutrons. Each was measured using **time-of-flight mass spectrometry**, a technique that involves determining the mass of a traveling ion by tracking the time it takes to travel a given distance when its initial acceleration is known.
- The research team noted that most of the isotopes they measured had never been measured before.
- They also noted that one of them, **uranium-241, had never been observed before and that it marks the first time since 1979 that a neutron-rich uranium isotope has been discovered.** The researchers also calculated that uranium-241 likely has a half-life of just 40 minutes.

Significance

- The technique used by **the team represents a pathway to better understanding the shapes of large nuclei associated with the heavy elements,** which could yield changes to models used to build nuclear power plants and weapons and to theories describing the behavior of exploding stars.
- The research team notes that that their **method of discovery could be used to learn more about other heavy isotopes** and also, **perhaps, to discover new ones.**
- **Uranium Element**
- Uranium (U) is a **radioactive chemical element of the actinide series of the**

periodic table, atomic number 92.

- Uranium is a **dense, hard metallic element that is silvery white in colour**. It is **ductile, malleable, and capable of taking a high polish.**

Occurrence:

- Uranium occurs **naturally in low concentrations in soil, rock and water** and is **commercially extracted from uranium-bearing minerals**.
- Uranium occurs naturally in several minerals such as **uraninite (pitchblende), brannerite and carnotite.** It is also **found in phosphate rock and monazite sands**. **Monazite sands occur on the east and west coasts and in some places in Bihar**. But the largest **concentration of monazite sand is on the Kerala coast.**

Applications

- Uranium that has a silvery grey metallic appearance is mainly used in nuclear power plants due to its unique nuclear properties.
- Naturally occurring uranium consists of 99% uranium-238 and 1% uranium-235.
- Uranium-235 is the only naturally occurring fissionable fuel (a fuel that can sustain a chain reaction). Uranium fuel used in nuclear reactors is enriched with uranium-235.
- Depleted uranium is also used as a shield against radiation in medical processes using radiation therapy and also while transporting radioactive materials.
- Uranium is also used by the military to power nuclear submarines and nuclear weapons.

Distribution of Uranium Across World

- Over two-thirds of the world's production of uranium from mines is **from Kazakhstan, Canada and Australia.**
- Olympic Dam and the Ranger mine in Southern Australia are important mines in Australia.
- **High-grade deposits are only found in the Athabasca Basin region of Canada**.

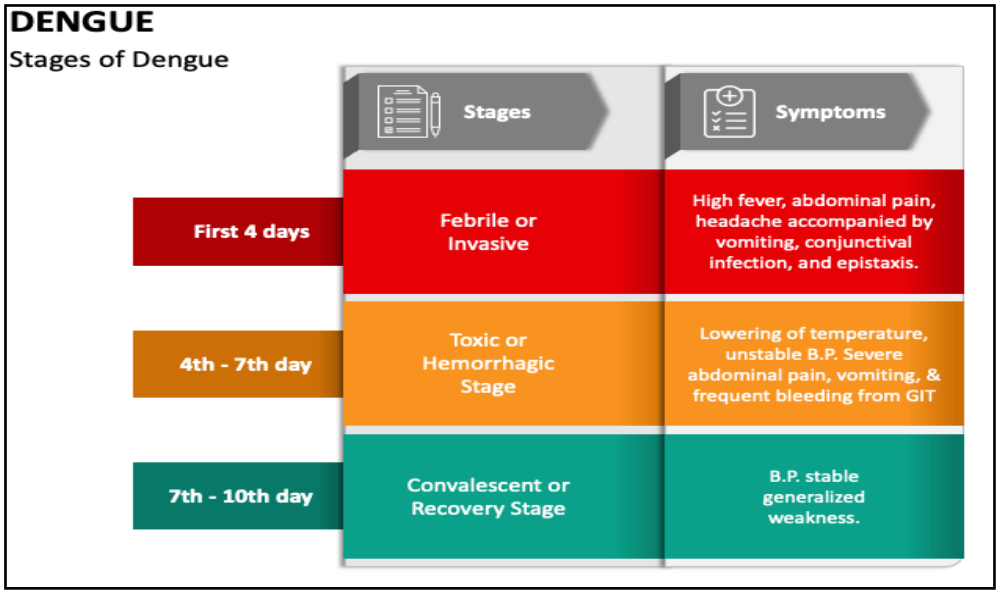
Uranium In India

- India produces about 2 percent of the world's uranium. The total reserves of uranium are estimated at 30,480 tonnes.

- **India has no significant reserves of Uranium**. **All needs are met through imports**. India imports thousands of tonnes of uranium from Russia, Kazakhstan, France.
- India has **22 reactors with an installed capacity of 6,780 megawatts**. Of these, eight reactors are fuelled by indigenous uranium while the remaining 14 are under IAEA safeguards and qualify to use imported uranium.

Topic 5. EVOLUTION OF DENGUE IN INDIA

Important for subject : Science and technology



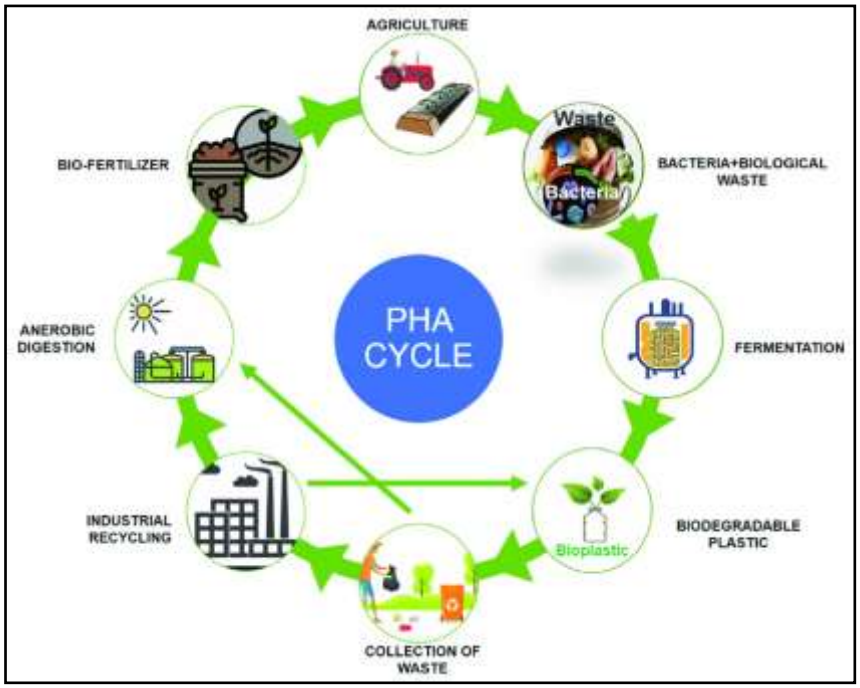
- A team of researchers from the Indian Institute of Science has **analyzed the evolution and diversity of dengue virus in India** by **studying 184 whole genome dengue sequences and 408 E gene sequences spanning over 60 years.**
- Researchers have found that the **cross-protection offered by the first infection with any of the four dengue serotypes starts to wane after two to three years**, and the **virus that is similar to the serotype that caused the first infection has a greater ability to cause severe disease than the other serotypes.**
- This is because while the **antibodies are not able to neutralise the virus belonging to different serotypes,** the virus is better able to bind to the antibodies leading to higher cell infection and thus enhanced severity and viral load.
- This is called the **antibody-dependent enhancement mediated by cross-reactive antibodies**.
- The dominant immune selection pressure has led to the **emergence of a unique**

Indian dengue lineage (DENV-4-Id) belonging to serotype 4(DENV-4).

- They identified a unique Indian dengue lineage (DENV-4-Id) belonging to serotype 4 (DENV-4) that is **dominant in South India**, and about 50% of infections in South India are due to this lineage.
- The researchers also found that the evolution of the viruses across serotypes has implications in vaccine efficacy as the current Indian lineages are highly divergent from those used in all major vaccines.

Topic 6. METHYL GROUPS ENHANCE KEY PROPERTIES OF PHA PLASTICS

Important for subject : Science and technology



- A class of polyesters considered a promising alternative to common plastics have now been made more mechanically tough and thermally stable.
- Researchers replaced the reactive hydrogens in the monomer of these materials — **polyhydroxyalkanoate (PHA) plastics —** and found that it enhanced PHA thermal and mechanical properties and enabled closed loop chemical recyclability.
- The new approach (Science) could provide a route for **increased use of sustainable PHA plastics.**
- **About PHA Plastics**
- PHA (polyhydroxyalkanoates) plastic is a **type of biodegradable plastic that is made from renewable resources,** such as **plant starches and oils.** In contrast,

traditional plastic is typically made from non-renewable resources, such as petroleum.

- **Plastics can also be produced from starch, a natural polymer**. Microorganisms transform this natural polymer to lactic acid, which is chemically treated to produce a plastic, **polylactide (PLA)-** Another option for sustainable plastics-But this is an expensive method.
- Biodegradable plastic products currently in the market are about two to 10 times more expensive than traditional plastics.
- Unlike production of PLA and **PHA made by fermentation**, **producing PLA through crops will involve competition for land needed to grow crops** for human consumption.

Topic 7. AUTO IMMUNE DISEASES

Important for subject : Science and technology

Evidence suggests that obese individuals have a higher risk of developing autoimmune diseases such as type 1 diabetes.

- A possible mechanism that could explain this connection — metabolic overload that suppresses immunoregulation and induces inflammatory responses, thereby increasing the risk of autoimmunity.

Auto Immune Diseases

- Autoimmune diseases **arise from an abnormal immune response of the body against substances and tissues normally present in the bod**y (autoimmunity).

- This may be restricted to certain organs or involve a particular tissue in different places.
- A large number of autoimmune diseases are recognized.
- It has been **estimated that autoimmune diseases are among the top ten leading causes of death among women in all age groups up to 65 years**. A substantial minority of the population suffers from these diseases, which are often chronic, debilitating, and life-threatening. There are more than 80 illnessescaused by autoimmunity.
- Normally our **immune system produces proteins called antibodies that protect the body from these invaders.**
- **Autoimmune means our immune system cannot tell the difference between these foreign invaders and our body's healthy tissues** ("auto" means "self") and creates auto-antibodies that attack and destroy healthy tissue. These autoantibodies cause inflammation, pain, and damage in various parts of the body.
- The treatment of autoimmune diseases is typically with immunosuppression—medication that decreases the immune response.

Topics 8. ENDOMETRIOSIS

Important for subject : Science and technology

Endometriosis

- Endometriosis is a disease **in which tissue similar to the lining of the uterus grows outside the uterus**. It can cause severe pain in the pelvis and make it harder to get pregnant.
- Endometriosis can start at a person's first menstrual period and last until menopause.
- With endometriosis, tissue similar to the lining of the uterus grows outside the uterus. This leads to inflammation and scar tissue forming in the pelvic region and (rarely) elsewhere in the body.
- The **cause of endometriosis is unknown**.
- There is **no known way to prevent endometriosis.** There is no cure, but its symptoms can be treated with medicines or, in some cases, surgery.
- Endometriosis **affects roughly 10% (190 million) of reproductive age women and girls globally.**

- It is a **chronic disease** associated with severe, life-impacting pain during periods, sexual intercourse, bowel movements and/or urination, chronic pelvic pain, abdominal bloating, nausea, fatigue, and sometimes depression, anxiety, and infertility.
- **Diagnosis Delay**
- A careful history of **menstrual symptoms and chronic pelvic pain provides the basis for suspecting endometriosis.**
- Although several screening tools and tests have been proposed and tested, **none are currently validated to accurately identify or predict individuals or populations** that are most likely to have the disease.
- Endometriosis can often present symptoms that mimic other conditions and contribute to a diagnostic delay.
- Ovarian endometrioma, adhesions and deep nodular forms of disease often require ultrasonography or magnetic resonance imaging (MRI) to detect.
- Histologic verification, usually following surgical/laparoscopic visualization, can be useful in confirming diagnosis, particularly for the most common superficial lesions.
- The need for histologic/laparoscopic confirmation should not prevent the commencement of empirical medical treatment.

Topic 9. EXISTING VACCINES VERSUS NEW VARIANTS

Important for subject : Science and technology

As COVID19 cases began rising yet again in India in March, many wondered whether the existing vaccines, based on the SARSCoV2 virus that was first reported in China, would still be effective against newer versions of the same virus.

Two pronged response

- Vaccines generate a two pronged immune response. The first is the production of antibodies by B cells, a type of white blood cells.
- Antibodies directly attack and destroy viruses. The second is the Tcell response. T cells are another type of white blood cells.
- They have many roles, of which one is to patrol the body and destroy virus infected cells. Both these arms also give rise to specialised memory cells, which are stored away for future needs.
- These two commodities are ‘freshly made’ by our body following an encounter with

the antigen, introduced during vaccination.

- Soon after vaccination, our antibody levels go up. This provides an early window of protection from infection.
- However, the levels of 'freshly made' antibodies start dropping within three months or so, and eventually plateau to a low baseline. This low level is not enough to prevent infection later.

Why do the levels drop?

- It is natural for the body to scale down the production of antibodies after the immediate threat has passed.
- If this immune contraction did not occur, our blood would be as thick as grease from all the antibodies produced against every pathogen we have encountered in our lives.
- The gradual drop in the level of antibodies is one reason why people sometimes pick up infections despite vaccination —this can occur even after receivingmultiple booster doses.
- The other reason is that the virus has altered itself, and some of the older antibodies are not able to lock on to the new targets.**Role of T cells in prolonged Immunity**
- Like **B cells, which produce antibodies**, **T cells are central players in the immune response to viral infection.**
- For your immune system to fight off any kind of invader, such as a virus, you need a kind of white blood cell called a B cell, which makes antibodies, and a similarlooking white blood cell called a T cell.
- T cells can play different roles altogether.
- They can act as "**killer cells",** attacking cells which have been infected with a virus or another kind of pathogen, or they can act as "helper cells" by supporting B cells to produce antibodies.

How do they function?

- Alongside antibodies, the immune system produces a battalion of T cells that can target viruses.
- Some of these, known as killer T cells (or CD8+ T cells), seek out and destroy cells that are infected with the virus.

- Others, called helper T cells (or CD4+ T cells) are important for various immune functions, including stimulating the production of antibodies and killer T cells.
- T cells do not prevent infection, because they kick into action only after a virus has infiltrated the body. But they are important for clearing an infection that has already started.
- In the case of COVID-19, killer T cells could mean the difference between a mild infection and a severe one that requires hospital treatment.

What did the latest research find?

- The researchers found that neutralising antibodies were detectable even 12 months after infection in "most individuals".
- It remained stable 6-12 months after initial infection in people younger than 60 years.
- The researchers found that "multifunctional T cell responses were detected for all SARS-CoV-2 viral proteins tested".
- And most importantly, the magnitude of T cell responses did not show any difference immaterial of how severe the disease was.
- While the ability of antibodies to neutralise was nearly absent against the Beta variant, it was reduced in the case of the Delta variant.

Neutralizing antibodies

- SARS-CoV-2-specific neutralising antibody and T cell responses were retained 12 months after initial infection.
- Neutralising antibodies to the D614G, Beta, and Delta were reduced compared with those for the original strain, and were diminished in general.
- Memory T cell responses to the original strain were not disrupted by new variants.
- The findings show that robust antibody and T cell immunity against SARS-CoV-2 is present in majority of recovered patients 12 months after moderate-to-critical infection.

Robustness of antibodies

- The study reveals the durability and robustness of the T cell responses against variants, including Delta, even after one year of infection.

- Most importantly, the robust and longstanding T cell responses were seen in people who have not been reinfected or vaccinated.
- This would mean even in the absence of vaccination, a person who has been infected by the virus even one year ago would have robust immune responses. It would offer protection against disease progressing to a severe form requiring hospitalization.

Topic 10. INDIAN SPACE ASSOCIATION

Important for subject : Science and technology

CDS Gen. Anil Chauhan has said that the world is witnessing the militarissation of space at the **Indian DefSpace Symposium organised by the Indian Space association (ISpA) in association with DRDO.**

According to the CDS (General Anil Chauhan), the very nature of warfare is on the cusp of major transformation with space being used to enhance combat capabilities in land, sea and cyber domains

Militarisation Of Space

- It refers to the **use of outer space for military purposes, i**ncluding the deployment of military assets such as satellites, weapons, and communication systems.
- The term generally refers to the integration of space capabilities into military planning and operations, as well as the use of space-based assets for intelligence gathering, surveillance, and navigation.

Weaponisation Of Space

- The Weaponisation of Space refers to the **development and deployment of weapons systems in outer space.** It is the **next level of militarisation** and envisages a situation where space is being used for military warfare. In this term, it can be said that space becomes the new frontier of war.
- **Initiatives by India towards the militarisation of space**
- In 2019, India concluded the **first table-top joint war game called 'IndSpaceEx'** – run by the **military and space scientists**.
- Demonstration of **India's Anti-Satellite (ASAT) capability** under **Mission Shakti.**
- Establishment of the **new tri-service Defence Space Agency (DSA**) – tasked with

operating the space-warfare and Satellite Intelligence assets of India.

- **Mission DefSpace** was launched in 2022 for the development of innovative solutions in the space domain by the industry.
- **Indian DefSpace Symposium, organised by the Indian Space Association (ISpA) and the DRDO** under Mission DefSpace, to **create a platform for all stakeholder**s who have a keen interest in boosting India's military space capability and plans.
- **Indian Space Association (ISpA) is** a **voluntary association of leading space industries** established with the objective of providing advisory and advocacy support to the space industry in India.

Indian Space Association (ISpA):

- ISpA aspires to be **the collective voice of the Indian Space industry** ISpA will be **represented by leading domestic and global corporations** that have advanced capabilities in space and satellite technologies.
- ISpA will undertake Policy Advocacy and engage with all stakeholders in the Indian Space domain, including the Government and its Agencies, to make India selfreliant, technologically advanced and a leading player in the space arena.
- ISpA will also work towards building global linkages for the Indian spaceindustry to bring in critical technology and investments into the country to create more high skill jobs.

Significance of ISpA:

- One of the main goals of the organisation is to supplement the government's efforts towards making India a global leader in commercial space-based excursions.
- Of late, ISRO's rockets have been carrying the payload and communication satellites of various countries; now, private players will also look to touch on this space with the new organisation.
- Several private sector companies have shown an interest in India's space domain, with space-based communication networks coming to the fore.

Other Related Organisations:

IN-SPACE:

- **Indian National Space Promotion and Authorization Centre (IN-SPACe)** was approved in 2020 to provide a level playing field for private companies to use Indian space infrastructure.

NSIL:

- **In** the 2019 Budget, the government had announced the setting up of a **New Space India Limited (NSIL)**, a public sector company that would serve as a marketing arm of ISRO (Indian Space Research Organisation).
- Its main purpose is to market the technologies developed by ISRO and bring it more clients that need space-based services.

That role, incidentally, was already being performed by Antrix Corporation,another public sector undertaking working under the Department of Space, and which still exists.

Topic 11. INDIA'S FIRST 3D-PRINTED POST OFFICE

Important for subject: Science and Technology

About 3D-printed post office:

It is located in Cambridge Layout in Ulsoor, Bangalore. It is **being implemented by Larsen & Toubro**, which has experience in constructing 3D-printed buildings.

It is a 1,100 sqft building which is expected to cost 30-40 per cent less than conventional buildings because of the technological intervention.

It is being built at a cost of Rs 23 lakh.

What is 3D-printing?

- **3D printing, or additive manufacturing**, is the **construction of a threedimensional object from a CAD model or a digital 3D model**
- The term "3D printing" can refer to a variety of processes in which material is deposited, joined or solidified under computer control to create a three-dimensional object,with material being added together (such as liquid molecules or powder grains being fused together), typically layer by layer.
- 3D printing starts by making a virtual design of the object to be created. Virtual design can be made using a 3D modelling program such as CAD (Computer Aided

Design) or 3D scanners.

- The 3D digital copy is then put into a 3D modelling program. The model is then sliced into hundreds or thousands of horizontal layers in preparation for printing.
- This prepared file is thus uploaded in the 3D printer which reads each slices in2D format and then proceeds to create the object layer by layer and the resulting object has no sign of layering visible, but a 3 dimensional structure.

Topic 12. 6 GHZ BAND SPECTRUM FOR WI-FI TO DRIVE BROADBAND PENETRATION

Important for subject : Science and technology

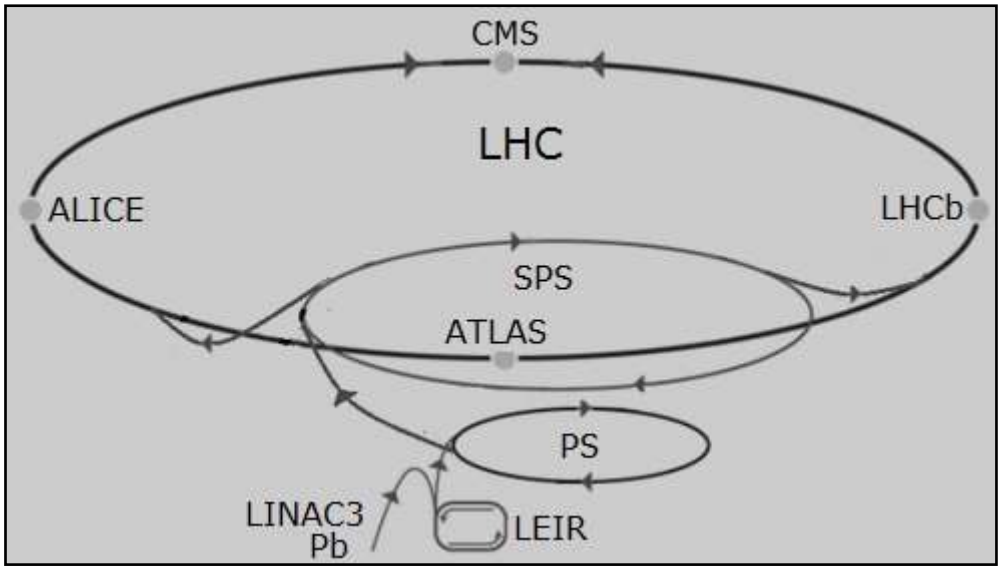
- New Delhi-based policy think tank Broadband India Forum (BIF) on Tuesday said the spectrum in the 6 **GHz band is crucial for Wi-Fi and the same is required to drive broadband penetration across the country.**
- **The 6 GHz band includes 1200 MHz spectrum in the range of 5.9-7.1 GHz**.
- According to National Frequency Allocation Plan 2022, the **spectrum in the band is allocated for fixed satellite and mobile services.**
- BIF has conducted a very exhaustive study for co-existence in the 6GHz band based on actual data, which has conclusively proved **that Wi-Fi can co-exist with incumbent users of Fixed Services (FS) and Fixed Satellite Service**s (FSS) in the band.
- However, Broadband India Forum and other experts believe that the **government should either delicense the complete spectrum available in the 6 GHz band for Wi-Fi or at least give part of the spectrum.**

Need for allocating the spectrum to WiFi :

- Given that **public Wi-Fi is the way to accelerate broadband penetration** across the country, liberalisation of public Wi-Fi through the PM-WANI scheme is one of the important steps to help achieve the government of India's vision of Digital India and to attain the objectives of providing **'Broadband for all'**.
- Allocating the spectrum for Wi-Fi include indoor coverage of internet better than mobile networks, boost innovations including artificial intelligence (AI) and virtual reality, etc, using Wi-Fi6E and Wi-Fi 7 technologies, mobile data offloading on Wi-Fi in areas with lower telecom coverage, among others.

Topic 13. LARGE HADRON COLLIDER

Important for subject : Science and technology



Large Hadron Collider (LHC)

- The Large Hadron Collider is a giant, complex machine built to study particles that are the smallest known building blocks of all things.
- LHC is a **collider that accelerates two beams of particles in opposite directions and smashes them head-on.**
- These **beams of particles are Hadrons**.
- Hadron is a **subatomic particle** made of **quarks, gluons and anti-quarks.**
- **Hadrons are the heaviest particles** and are **composed of two or more quarks** that are **held strongly by electromagnetic force**.
- LHC is built by the **European Organization for Nuclear Research (CERN).**

Functioning of Large Hadron Collider

- The LHC uses Protons, which are made up of quarks and gluons and it energises the protons by accelerating them through a **narrow circular pipe that is 27 km long.**
- This circular pipe encircles two D-shaped magnetic fields, created by close to 9,600 magnets.
- In the pipe, Protons are made to move by turning on one hemisphere of magnets and turning off the other and once it reaches a specific position the magnetic polarity is reversed by turning off the first hemisphere and turning on the second.

- This makes the Proton move in an anticlockwise direction and by switching the direction of the magnetic field rapidly, Protons are accelerated through the beam pipe.
- There are a few other components placed in the pipe that ensure that the particles do not hit the pipe's walls.
- This process makes the Protons move at 99.999999% of the speed of light which helps them accrue a tremendous amount of energy as per the special theory of relativity.
- When two antiparallel beams of energised particles collide head-on, the energy at the point of collision is equal to the sum of the energy carried by the two beams.
- At the time of the collision, chaos is witnessed and parts of energy coalesce into different subatomic particles based on the fundamental forces of nature.
- The particles take shape depending on the amount and flavour of energyavailable and which other particles are being created or destroyed around them.
- A few particles are created very rarely i.e. are created with a probability of 0.00001%.
- A few other particles are quite massive and require the right kind of energy to be created.
- A few other particles are extremely short-lived and the detectors studying them need to record them in a similar timeframe.
- The LHC is built in such a way that scientists can alter all these parameters to study different particle interactions.

The Findings of the LHC

- The LHC has nine detectors that are placed at different points on the beam pipe.
- These detectors are used to study particle interactions in different ways.
- Annually, these detectors generate close to 30,000 TB of data worth storing, Physicists filter this data with the help of computers to identify and analyse specific patterns.
- This is similar to how **the ATLAS and CMS detectors helped discover the Higgs boson**.
- The LHC is known for accelerating a beam of hadronic particles to certain specifications and delivering it which facilitates scientists to do different things with the beam.

- With the help of data generated from all these collisions, researchers have tested the predictions **of the Standard Model of particle physics, the reigning theory of subatomic particles, observed exotic particles such as pentaquarks and tetraquarks and examined the extreme natural conditions that existed right after the Big Bang**.

Latest Upgrade:

- This is **the LHC's third run**, it will operate round-the-clock for four years at unprecedented energy levels of 13 tera electron volts. (An electron volt is the energy given to an electron by accelerating it through 1 volt of electric potential difference).
- Scientists are aiming to be delivering 1.6 billion proton-proton collisions per second" for the ATLAS and CMS experiments.
- **ATLAS**: Largest general purpose particle detector experiment at the LHC.
- **Compact Muon Solenoid (CMS) experiment:** one of the largest international scientific collaborations in history, with the same goals as ATLAS, but which uses a different magnet-system design.

Topic 14. GRAPHENE

Important for subject : Science and technology

Graphene is a one-**atom-thick sheet of carbon atoms** arranged in a honeycomblike pattern. It is an is an allotrope of carbon. Graphene is considered to be the world's thinnest, strongest and most conductive material – of both electricity and heat.

Properties: It is harder than diamond yet more elastic than rubber; tougher than steel yet lighter than aluminium. Graphene is the strongest known material.

Other Properties of Graphene are:

1. Lowest resistivity substance known at room temperature.
2. High thermal stability.
3. High elasticity.
4. High electrical conductivity.
5. Electron mobility is high at room temperature.
6. Graphene oxide (GO) membranes can be used to filter common salt from seawater.

Applications of graphene/GO/rGO

- Graphite and its derivate recently gained science and engineering awareness due to its numerous applications.
- The discovery of graphene is rightly regarded as a milestone in the world of material science; as can be seen in the worldwide attention, the material has received in the fields of electronics, photonics, capacitors/supercapacitors, biosensing, etc.
- They are used in numerous applications as illustrated below. In this book, applications of graphene and its derivatives are discussed in detail.
- These applications include **photocatalysis, electronics, gas sensing, graphemebased heterogeneous electrodes for energy storage devices, etc. In addition, sound devices based on graphene is also explained in this book.**
- **Carbon Allotropes:** Diamond, graphite and fullerenes (substances that include nanotubes and buckminsterfullerene) are the important allotropes of pure carbon.
- Allotropy is the property of some chemical elements to exist in two or more different forms, in the same physical state.

Topic 15. JUPITER ICY MOONS EXPLORER (JUICE) MISSION

Important for subject : Science and technology

The European Space Agency (ESA) is all set to launch the Jupiter Icy Moons Explorer, or Juice, mission from its spaceport in French Guiana on an Ariane 5 launcher.

About Juice Mission

- It is planned to **reach Jupiter in 2031**.
- The **mission aims to carry out a detailed exploration of Jupiter and its icy moons – Ganymede, Callisto and Europa**, which potentially have habitable environments.
- The main focus will be on **Ganymede, as it is the largest moon in the Solar System** and the **only one to generate its own magnetic field**.
- Another primary goal of the mission is to **create a comprehensive picture of Jupiter** by trying to understand its origin, history and evolution.
- Juice will also analyse the chemistry, structure, dynamics, weather, and climate of Jupiter and its ever-changing atmosphere.
- However, **Juice isn't equipped to detect life.**

- It is capable of is finding out whether there could be places where the necessary conditions, such as water, biological essential elements, energy, and stability, to sustain life are present.

Other spacecraft to Jupiter:

- Only two other spacecraft have ever examined Jupiter: the **Galileo probe**, which orbited the gas giant between 1995 and 2003, and **Juno,** which has been circling the planet since 2016.

Europa Clipper:

- By the time Juice reaches Jupiter, another spacecraft, **NASA's Europa Clipper, would already be orbiting the planet.**
- It is **scheduled to be launched in 2023.**

It would arrive at Jupiter in 2030 and aims to study its Europa moon.

Topic 16. BIOLUMINESCENCE

Important for subject : Science and technology

A stretch of the beach at Bheemili near Visakhapatnam glows due to bioluminescence.

Bioluminescence

- Bioluminescence occurs **mainly due to the presence of single-celled organisms called dinoflagellates that produce light** when disturbed.
- Various other marine species such as **sponges, jellyfish, worms, species of fish, arthropods, echinoderms and unicellular alga also exhibit bioluminescence.**
- Bioluminescence is a **type of chemiluminescence**, i.e. it **involves a chemical reaction which produces light.**
- Such chemical reactions involve two unique chemicals **namely luciferin and luciferase.**
- **Luciferin is the compound that produces light** and it acts as the substrate.
- **Luciferase is an enzyme or a catalyst** that interacts with a substrate to affect the rate of a chemical reaction.
- Photoprotein can also act as a catalyst in such reactions.

- The phenomenon of **bioluminescence on beaches** is seen to be a **natural phenomenon.**
- Bioluminescence is a "cold **light".**
- Cold light means less than 20% of the light generates thermal radiation or heat.
- In the case of Visakhapatnam, **bioluminescence is said to be a result of an algal bloom of the dinoflagellate species** of noctiluca and ceratium.
- Bioluminescence has been witnessed on some other beaches in India including **Havelock Island in the Andamans, Thiruvanmiyur Beach in Chennai, Mattu Beach in Karnataka, Bangaram Island in Lakshadweep and Kerala's Kumbalangi**.
- **Implications Bioluminescence may not be harmful to humans but it can have significant implications on the marine ecosystem** as phytoplanktons are consumed by fish and the harmful algal blooms have led to mass mortality of fish species in the past.
- Further, the rapid algal growth of noctiluca is attributed to environmental changes such as sudden low salinity or disturbance by pollutants.

Topic 17. NISAR SATELLITE TO MAP HIMALAYAS' SEISMIC ZONES

Important for subject : Science and technology

NISAR satellite is **going to map the most earthquake-prone regions in the Himalayas** with unprecedented regularity and aims to build an advance warning system of land subsidence and earthquakes.

Need of the initiative:

- A **large section of the Himalayan region falls in Zone V,** implying **the highest risk** of strong earthquakes.
- The NISAR satellite will use two frequency bands: **the L-band and S-band to image the Himalayan region.**
- These two frequency bands will together provide high-resolution, all-weather data from the satellite that is expected to follow a sun-synchronous orbit.

Frequency to map:

- The seismically active Himalayan region that will, every 12 days, create a

"deformation map".

- The map is going Map the Strain which refers to the deformation that occurs in rocks when it is under pressure from other rocks, usually due to movements of continental plates that are sliding, colliding, or subducting against each other. **Note**: The Indian Plate collided into the Eurasian plate forming the Himalayas and continues to incrementally push it upwards.
- Scientists from the **Geological Survey of India in 2021 published a "strain map" of the Himalaya**s based on data from 1,252 GPS stations along the Himalayas.
- It **identified regions that had the greatest odds of generating earthquakes of magnitude above 8 and their extent.**

Significance:

- It will also serve as a valuable tool to give warning of land subsidence as scientists can use the data collected and under all-weather conditions to study deformation patterns.
- The geoscience community can use this to determine how strain is building up in various parts of the Himalayas.

About NISAR:

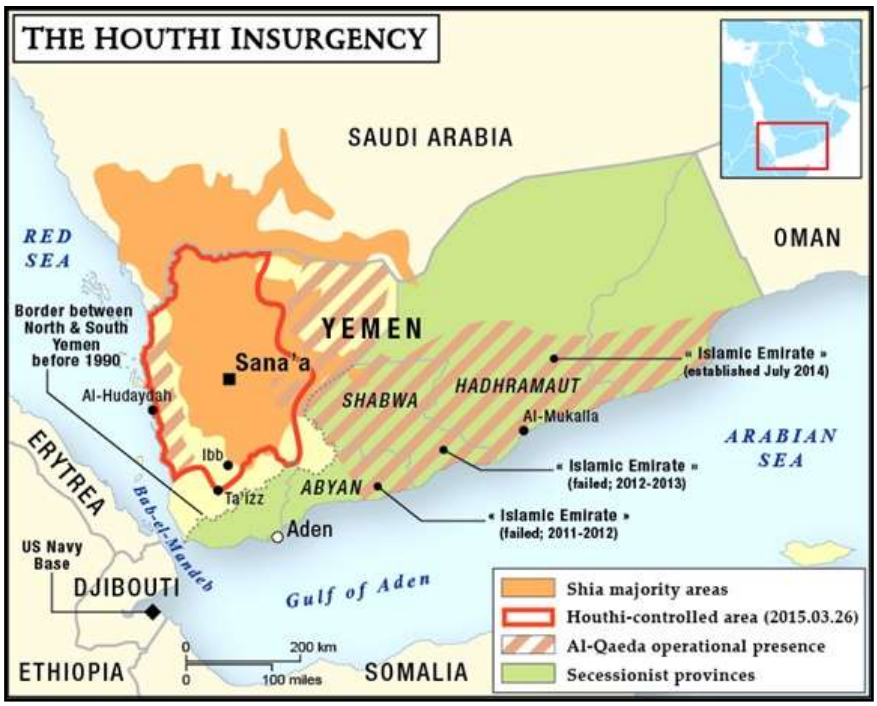
- NISAR stands for NASA-ISRO Synthetic Aperture Radar.
- NISAR satellite was **jointly developed by the Indian Space Research Organisation (ISRO) and the National Aeronautics and Space Administration (NASA) of the U.S.**
- NISAR is expected to be launched in January 2024 from Satish Dhawan Space Centre into a near-polar orbit.
- It is an **Earth observation satellite**.
- The 2,800 kilograms satellite consists of both L-band and S-band syntheticaperture radar (SAR) instruments, which makes it a dual-frequency imaging radar satellite.
- NASA has provided the L-band radar, GPS, a high-capacity solid-state recorder to store data, and a payload data subsystem.
- And the ISRO has provided the S-band radar, the GSLV launch system and spacecraft.
- Another important component of the satellite is its large 39-foot stationary antenna

reflector

- It is made of a gold-plated wire mesh, the reflector will be used to focus the radar signals emitted and received by the upward-facing feed on the instrument structure.

Topic 18. SAUDI OMAN TEAM TO TALK TO HOUTHIS TO END YEMEN WAR

Important for subject : International Relations



A Saudi Omani delegation is planning to travel to Yemen's capital Sanaa next week to hash out a permanent ceasefire deal with Houthi officials and end the country's eight year old conflict.

It is also a sign that regional rifts are easing after rivals Saudi Arabia and Iran agreed to restore relations last month after years of hostility and backing opposite sides in Middle Eastern conflicts, including Yemen.

Yemen Conflict:

- Since 2014, Yemen has been facing a multi-sided conflict involving local, regional, and international actors.
- The Houthis, who ruled a kingdom there for nearly 1,000 years, used widespread anger against President Hadi's decision to postpone long-awaited elections and his stalled negotiations over a new constitution.

- They marched from their stronghold of Saada province to the capital Sanaa and surrounded the presidential palace, placing Hadi under house arrest.

Saudi Arabia's Intervention:

- A military coalition led by Saudi Arabia intervened in Yemen in March 2015, at Hadi's request, after the Houthis continued to sweep the south and threatened to conquer the last government stronghold of Aden, prompting one of the world's worst humanitarian crises ever.

Houthis

- **Yemen is located at the junction of the Red Sea and Gulf of Aden, its coastline commanding the strategic strait of Bab al-Mandab**.
- The country has been wracked by civil war for more than seven years now, and the Houthis control the western part of the country, including the capital Sana'a.
- The **Houthis are a large clan belonging to the Zaidi Shia sect**, with **roots in Yemen's north western Saada province.** Zaidis make up around 35 per cent of Yemen's population.
- The **Zaid is ruled over Yemen for over a thousand years until 1962**, **when they were overthrown and a civil war followed, which lasted until 1970**.
- The Houthi clan began to revive the Zaidi tradition from the 1980s, resisting the increasing influence of the Salafists, who were funded by the state.
- In 2004, the Houthis began an insurgent movement against the Yemeni government, naming themselves after the political, military, and religious leader
- Hussein Badreddin al-Houthi, who was assassinated by Yemeni security forces in September of that year.
- Several years of conflict between the Houthis and Yemen's Sunni majority government followed.

Zaydis

- Zaydis are the **oldest branch of the Shia**.
- The **Zaydis are named after Zayd Bin Ali, the great grandson of Imam Ali,** Prophet Mohammed's cousin and son-in-law who Shias, Sunnis and Zaydis revere.

- Zayd Bin Ali had led a revolt against the Ummayad Caliphate in the eighth century.
- He was killed, but his martyrdom led to the rise of the Zaydi sect. While the Zaydis are seen part of the Shia branch of Islam, both in terms of theology and practice, they are different from the 'Twelver' Shias of Iran, Iraq and Lebanon.
- For centuries, the Zaydis were a powerful sect within Yemen.
- After the collapse of the Ottoman Empire in 1918, the Zaydis would establish a monarchy (the Mutawakkilite Kingdom) in the country. But their dominance would come to an end in 1962 when the Egypt-backed republicans overthrew the monarchy.

Topic 19. 75 YEARS OF WORLD HEALTH ORGANISATION

Important for subject : International Relations

The World Health Organization (WHO) was born when its constitution came into effect on April 7, 1948.

How is the WHO governed?

- The **WHO is headquartered in Geneva and has six regional and 150 country offices**.
- It is controlled by delegates from its 194 member states, who vote on policy and elect the director general.
- Tedros Adhanom Ghebreyesus, previously Ethiopia's foreign minister, was elected to a five-year term in 2017 and reelected in 2022.
- WHO delegates set the agency's agenda and approve an aspirational budget each year at the World Health Assembly.
- The director general is responsible for raising the lion's share of funds fromdonors.
- **Success**
- Some of the WHO's most lauded successes include **its child vaccination programs, which contributed to the eradication of smallpox in 1979** and a **99 percent reduction in polio infections in recent decades,** and its leadership during the 2003 **severe acute respiratory syndrome (SARS) epidemic.**
- The agency has the **exclusive authority to declare global health emergencies**, which it has done several times since its members granted it the power in 2007.
- WHO has **undertaken reforms to improve its ability to fight future epidemics** and boost the health of the hundreds of millions of people still living in extreme poverty.

- **Failures**
- The organization's **agreement to give up on trying to eradicate malaria in the 1960s** represents another example of what some consider a botched job.
- Many critics have faulted the **WHO for slow and poorly coordinated responses to outbreaks.** That includes **the 2014 Ebola outbreak**, in which it waited five months before declaring a PHEIC, despite pleas from groups such **as Doctors Without Borders.**
- WHO is in an **uphill battle to loosen its rigid bureaucracy and it faces an increasingly troublesome budget.**
- The **COVID-19 pandemic has proved to be another monumental challenge** for the health agency, sparking fresh debate over its effectiveness.
- The WHO has become **increasingly dependent on voluntary contributions**, which puts pressure on the organization to align its goals with those of its donors.

What reforms has the WHO made?

- Responding to these criticisms, the organization instituted several reforms intended to improve its responses, including the **creation of a reserve force of public health workers and a $100 million emergency fund.**
- The WHO also added an **incident management system** that allows it to place medical responders, equipment, and supplies such as medicines on the ground right away while it coordinates a broader response.
- In a rare special session of the **WHO's World Health Assembly in 2021**, delegates initiated the drafting of a **global treaty on pandemic prevention, preparedness, and response.**
- At the 2022 assembly, **countries agreed on a U.S.-led proposal to strengthen the IHR by increasing member states' accountability around disease outbreaks,** though no changes have been formally approved.

Topic 20. LANGUAGE FRIENDSHIP BRIDGE

Important for subject : International Relations

About the Project

The **Indian Council for Cultural Relations** (ICCR) has envisaged a special project called

'**The Language Friendship Bridge**', which plans to **train five to 10 people in the official languages of Myanmar, Sri Lanka, Uzbekistan, Indonesia.**

Aim :

- To expand its cultural footprint in nations with which it has historical ties.
- To facilitate better people-to-people exchanges.

Languages :

- As of now, **the ICCR has zeroed in on 10 languages**: Kazakh, Uzbek, Bhutanese, Ghoti (spoken in Tibet), Burmese, Khmer (spoken in Cambodia), Thai, Sinhalese and Bahasa (spoken in both Indonesia and Malaysia).
- Experts also feel that the ICCR's list of languages needs to be expanded, with India seeing a boom in cultural and economic ties with other neighbouring countries as well.

How will it be done?

- There are **two possibilities.**
- One is to start tie-ups wherein teachers from these countries come and teach courses in India.
- The second approach is the ICCR offering scholarships to Indian students to go and study these languages in the countries where they are spoken.
- Language experts feel that the second option is the better one as a proper cultural environment is needed to learn a language in its entirety.

About ICCR

- The **Indian Council for Cultural Relations (ICCR),** is an **autonomous organisation**of the Government of India, involved in India's global cultural relations, through cultural exchange with other countries and their people.
- It was **founded on 9 April 1950 by Maulana Abul Kalam Azad,** thefirst Education Minister of independent India.
- The **ICCR Headquarter is situated at Azad Bhavan, New Delhi**, with regional offices.
- The council also operates missions internationally.

Activities

- The Council addresses its mandate of cultural diplomacy through a broad range of activities.
- In addition to **organising cultural festivals in India and overseas**, the ICCR **financially supports a number of cultural institutions across India**, and sponsors **individual performers** in dance, music, photography, theatre, and the visual arts.
- It also **administers the Jawaharlal Nehru Award for International Understanding**, established by the Government of India in 1965, whose last award was in 2009.

Topic 21. INTERNATIONAL PRIZE OF STATISTICS

Important for subject : International relations

Calyampudi Radhakrishna Rao, an **Indian-American statistician**, has been awarded the **2023 International Prize in Statistics, the statistical equivalent of the Nobel Prize.**

Contributions of Calyampudi Radhakrishna Rao

- In 1945, Professor Rao's article, "Information and Accuracy Attainable in the
- Estimation of Statistical Parameters," was published. It encouraged the rapid growth of contemporary statistics and their use in research.
- In 1948, one of Professor Rao's publications proposed a revolutionary general technique for evaluating hypotheses, which became known as the "Rao score test."
- This and two other tests devised by Jerzy Neyman, E.S. Pearson, and Abraham Wald are commonly referred to as the "holy trinity" of statistics.
- Professor Rao's work has influenced statistics, economics, genetics, anthropology, geology, national planning, demography, biometry, and medicine.

International Prize in Statistics

- It is **awarded to an individual or group once every two years** "for significant breakthroughs utilising statistics to improve science, technology, and human welfare."
- The prize is **modelled after the Nobel Prize, Abel Prize, Fields Medal, and Turing Award, and it carries an $80,000 monetary award.**
- The International Prize in Statistics and the COPSS Presidents' Award are the two top honours in statistics.

Topic 22. COMSTOCK ACT 1873

Important for subject : International Relations

A 19th century "anti-vice" law is at the center of a new court ruling that threatens access to the leading abortion drug in the U.S.

Dormant for a half-century, the **Comstock Act has been revived by anti-abortion** groups and conservative states **seeking to block the mailing of mifepristone, the pill used in more than half of U.S. abortions.**

Comstock Act

- Originally passed in 1873 and named for an anti-vice crusader, the **Comstock Act was intended to prohibit the mailing of contraceptives, "lewd" writings and any "instrument, substance, drug, medicine, or thing" that could be used in an abortion.**
- The law's scope has been repeatedly narrowed by federal courts and Congress, which eliminated the reference to contraceptives in the 1970s. And the federal government hasn't enforced the law since the 1930s, according to legal experts.

Current Issue over the law

- The law was essentially dormant in the 50 years after Roe v. Wade established a federal right to abortion. And until the FDA loosened its requirements on **mifepristone** in 2021, there was no real way to enable abortion through the mail.
- But Rachel Rebouché of Temple University's law school says anti-abortion groups — emboldened by the Supreme Court decision overturning of Roe — have seized on Comstock to try and shut off the flow of abortion drugs.

Medical Abortion

- Medication abortion is a regimen of pills women can take at home, a method increasingly used around the world.
- **Mifepristone**, blocks a hormone called progesterone that is necessary for a pregnancy to continue. **Misoprostol,** brings on uterine contractions. Mifepristone, used along with misoprostol, is the most commonly used method of abortion in the US

Topic 23. UN DEMOCRACY FUND

Important for subject : International Relations

That **India, a founding member of UNDEF**, has no objections to the Fund giving grants to NGOs funded by George Soros, while he is put on the watchlist in India underlines a contradiction that's not new.

About UNDEF

Background :

- **India and the US were prime movers behind the UN Democracy Fund** in 2005, when they were **negotiating the civilian nuclear co-operation deal**.
- As Joint Secretary (Americas) at the time, S Jaishankar was a lead negotiator.
- **UNDEF was created by UN Secretary-General Kofi A. Annan in 2005** as a United Nations General Trust Fund to **support democratization efforts around the world.**

Role

- UNDEF **funds projects that empower civil society, promote human rights, and encourage the participation of all groups in democratic processes.**
- The large **majority of UNDEF funds go to local civil society organizations.**
- In this way, UNDEF plays a novel and unique role in complementing the UN's other, more traditional work — the work with Governments — to strengthen democratic governance around the world.

Finance

- UNDEF subsists **entirely on voluntary contributions from Governments**; in 2021, it reached **almost 220 million dollars in contributions and counts more than 45 countries as donors**, including **many middle- and low-income States in Africa, Asia and Latin America.**
- In 15 Rounds of Funding so far, UNDEF has supported over 880 two-year projects in more than 130 countries.
- Grants ranging from US$100,000 to US$300,000 support initiatives in the areas of:
- Support for Electoral Processes
- Women's Empowerment

- Media and Freedom of Information
- Rule of Law and Human Rights
- Strengthening Civil Society Interaction with Government
- Youth Engagement

UNDEF Composition:

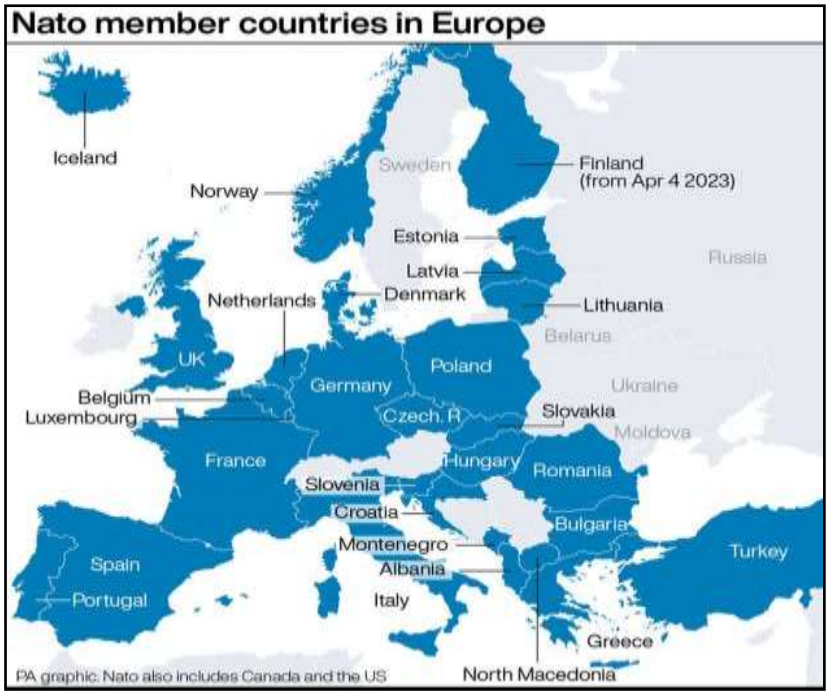
- The Advisory Board, constituted by the Secretary General, includes eight largest
- Member State contributors and six other states to reflect diverse geographical representation.
- **India has been a member of the Board since the beginning**.
- The Advisory Board considers the proposals from NGOs and recommends proposals for approval by the Secretary General.

India's Contribution to UNDEF:

- India gave $5 million to the fund in 2005, 2006, 2008, 2009 and 2011.
- The contributions began dipping from 2012 ($4.71 m) and the following year it was $1.85 million.
- After no contribution in 2017, India was back with $100,000 in 2018 and 2019. In 2020, 2021 and 2022, it gave $150,000.

Topic 24. ON FINLAND'S JOURNEY TO JOIN NATO

Important for subject: International Relations



Finland, on April 4, 2023, joined the North Atlantic Treaty Organization (NATO) and became the 31st member of the Organization.

Background:

- Finland has joined NATO due to Russia's invasion of Ukraine, which has made its smaller neighbors feel the need for the powerful military backing that NATO provides. Finland and Sweden applied for NATO membership after the invasion. Finland which shares a 1,340-km border with Russia, has ended more than 70 years of military non-alignment — in fact, in the Cold War years, a **policy of neutrality between the Soviet Union and the West was known as 'Finlandisation',** and **Finlandisation had been one of the options discussed for Ukraine before Russia invaded it.**
- Experts, however, believe that Finland is not the first and would not be the last neighbour of Russia to join NATO.
- Before Finland, **countries like Norway (1949, and a founding member), Latvia (2004), Estonia (2004), Poland (1999) and Lithuania (2004) joined NATO.**

Impacts of Joining NATO:

- Finland has gained better security, but it is losing out on significant trade and tourism

revenue it was making from Russia, and its status as a confidence-building presence in the Baltic Sea and Europe at large is being threatened.

- For NATO, the addition of Finland brings in a military trained to repel an attack from Russia and strengthens its position to station weapons closer to Russia.
- However, Russia sees this as a dangerous historical mistake that could escalate the Ukraine conflict and has said it will strengthen its military capacity in its west and northwest.

Paasikivi's line:

- Post the Second World War, the skilful diplomacy and pragmatism displayed by Finnish President Juho Kusti Paasikivi helped the country to save itself from the spread of communist ideology.
- In 1948, the Agreement of Friendship, Cooperation, and Mutual Assistance was signed between the USSR and Finland.
- Paasikivi's line was based on the idea of peaceful coexistence with the USSR and neutrality was the key motive. This helped Finland address the complexities in global geopolitics post the Second World War.
- This became popular as "**Finland's neutrality".**

About Finland

- Finland is part of Scandinavia (a geographical region) in northern Europe, and shares land borders with Norway, Sweden, and Russia.
- Finland is heavily forested, with over 70 percent of the country covered by thick woodlands.
- Finland's underlying structure is a huge worn-down shield composed of granite dating from Precambrian time.
- The **Baltic Sea borders the country to the south and southwest**.
- The coastline of the country is contains nearly 180,000 small islands. Finland's remote **northern province, known as Lapland**, sits **above the Arctic Circle**.
- The **aurora borealis (northern lights) can be seen in the Lapland region regularly**.

Topic 25. ISRAEL- SYRIA CONFLICT

Important for subject: International Relations

Israel shelled parts of Syria, claiming it was in response to rockets being fired at **Golan Heights** from the neighboring country.

- **al-Quds Brigade —** a **Damascus-based Palestinian militant group** loyal to the Syrian regime — claimed responsibility for the rocket attacks, saying they were launched in retaliation for the recent raids at the **al-Aqsa mosque** by the Israeli police.
- **Why is the conflict boiling over recently?**
- With an ultra-nationalist government coming to power in Israel, the region has been simmering for months.
- Israeli police raided Jerusalem's **Al-Aqsa mosque**, **considered the third holiest site in Islam.**
- This served as the immediate trigger for a wave of rocket attacks, includingfrom
- **Lebanon, the Gaza Strip, and Syria**.
- In Syria, Israel's actions come out of the fear that arch-rival Iran is using the longrunning war in the country to station its fighters and weapons close to Israel's borders.
- Israel is also locked in a **conflict with the Hezbollah,** which holds **sway in another neighbour, Lebanon.**
- **al-Aqsa Mosque & Associated Conflict**

- The al-**Aqsa Mosque is one of Jerusalem's most recognized monuments**.
- The site is part of the Old City of Jerusalem, sacred to Christians, Jews and Muslims.
- The **United Nations Educational, Scientific and Cultural Organization (UNESCO), has classified the Old City of Jerusalem and its walls as a World Heritage Site.**
- The mosque's complex is the reason for the conflict between Israel & Palestine (Islam & Judaism).
- **Al-Aqsa Mosque** is one of **Islam's most revered locations**, and the **Temple Mount is the holiest site in Judaism.**
- The **Temple Mount is a walled compound inside the Old City in Jerusalem**, and is the site of two structures:
- The **Dome of the Rock to the north** and the **Al-Aqsa Mosque to the south**.

To the **southwest of the Temple Mount**, is the **Western Wall**, a remnant of the Second Temple and the holiest site in Judaism.

Topic 26. 25 YEARS OF GOOD FRIDAY AGREEMENT

Important for subject : International Relations

US President visited **Belfast, the capital of Northern Ireland**, to mark the 25th **anniversary**

of the Good Friday Agreement.

What were The Troubles?

- Northern Ireland was created in 1921 and in 1922 the rest of Ireland gained independence from the British (the today's Republic of Ireland, with its capital in Dublin).
- Northern Ireland remained with the UK, but tensions simmered between those who wished to remain with the UK (Protestants) and those who wanted to join Ireland (Catholics).
- By the 1960s, the Protestants had become more powerful and the Catholics started facing discrimination.
- The violence erupted between both factions – The Troubles, claiming the lives of more than 3,500 people.

Good Friday Agreement

- The Good Friday Agreement was signed on April 10, 1998, **between factions of Northern Ireland, and the governments of Britain and Ireland, to end decades of violence in Northern Ireland** among those who wished to remain with the United Kingdom (UK) and those who wanted to join Ireland.
- The negotiators included then British Prime Minister Tony Blair, then Irish Prime Minister Bertie Ahern, George Mitchell, a former Democratic senator who acted as the envoy of then US President Bill Clinton, and eight parties from Northern Ireland.
- **Terms of the Good Friday Agreement**
- **Northern Ireland would remain part of the UK, but could join Ireland** if, in a referendum, a majority of people on both sides voted for it.
- People **born in Northern Ireland could have Irish or British nationality orboth**.
- **Weapons by paramilitary groups would have to be decommissioned**, but people in jail for violence so far would be released.
- **Northern Ireland would get a new government, where both the nationalists and unionists would be represented.**
- This devolved government would sit at Stormont and have powers over most local matters, while the UK government would look after security, foreign policy, tax laws,

immigration rules, etc.

- On May 22, 1998, a referendum was held in Ireland and Northern Ireland, and the agreement was approved by 94 per cent of voters in Ireland and 71 per cent in Northern Ireland.

Topic 27. TEJAS, SUKHOI JETS PARTICIPATE IN COPE EXERCISE

Important for subject: International relations

The Indian Air Force (IAF) fighters, including Tejas **Light Combat Aircraft (LCA), Rafale, SU-30MKI, and Jaguars,** are set to participate in bilateral air **Exercise Cope India 23** with US Air Force (USAF) F-15 fighters and B-1B long-range bombers.

Background

- Cope India began in 2004 as a **fighter training exercise held at Air Station**
- **Gwalior, India.**
- The exercise has evolved to incorporate Important for subject matter expert exchanges, air mobility training, airdrop training and large-force exercises, in addition to fightertraining exercises.
- The **exercise showcases U.S. and India's efforts and commitment to a free and open Indo-Pacific region.**
- **About the exercise**
- It is a **bilateral exercise between the air forces of the two countries**.
- The exercise comes amid India's continuing three-year-long military confrontation with China in eastern Ladakh as well as the ongoing Russia-Ukraine war, which has seen Beijing and Moscow get into a tighter strategic clinch.

Highlights of the 2023 version

- The exercise will be **conducted in two phases**, with the **first phase practicing the air-mobility component involving transport aircraft of both countries**.
- The IAF element will include the Su-30MKI, Rafale, Tejas, and Jaguar fighter aircraft, while Japan is taking part in the exercise as an observer.
- The second phase of the exercise will witness the participation of B-1B bombers of USAF, and F-15 fighter aircraft of the USAF will join the exercise subsequently, according to an IAF statement.

- The **exercise will be supported by aerial refuellers, Airborne Warning and Control System, and Airborne Early Warning and Control aircraft of the IAF.**

Topic 28. INTERNATIONAL CONFERENCE ON DEFENCE, FINANCE AND ECONOMICS

Important for subject :International Relations

Defense Minister Rajnath Singh inaugurated the three-day International Conference on Defense Finance and Economics in New Delhi.

About the conference

- The conference is **organized by the Ministry of Defence.**
- It will **provide a platform to eminent policy makers, academicians and government officials from home and abroad** to share their insights and experiences on defense finance and economics in the context of emerging security challenges and policies globally.
- Delegates from **USA, UK, Japan, Australia, Sri Lanka, Bangladesh and Kenya** are participating in the conference.

Objective of the Conference

- To promote dialogue and cooperation among the participants and contribute to the defense preparedness of the country with optimum financial resources and effective implementation of the defense budget.
- Participating in global discussions on defense finance and economics and proposing a sustainable roadmap on the Important for subject.
- To disseminate the best practices, experiences and expertise of various countries and align processes in the Indian context with international standards.

The topics of discussion

- Current challenges and opportunities in the areas of Defence Finance and Economics, such as how to allocate and use resources efficiently & effectively.
- Different models and practices of finance and economics related to Defence Acquisition around the world.
- Latest developments and innovations in Defence Research and Development.

- Best practices on managing human resources in Defence, including issues related to pay, pensions and welfare of Defence Personnel and the role & functions of oversight mechanisms within defence ecosystems.

Topic 29. GERMANY ENDS NUCLEAR ERA BY SHUTTING DOWN LAST THREE POWER PLANTS

Important for subject : International Relations

- Reaching its final step in quitting nuclear power, Germany on Saturday pulled the plug on its last three nuclear power stations, ending the country's nuclear era that began almost six decades ago.
- Berlin has an ambitious goal of turning to fully renewable electricity by 2035 and by shutting down the last three nuclear plants on Saturday, it reached a little bit closer to achieving its aim.

Nuclear Plants

- The nuclear power stations of **Isar II, Emsland and Neckarwestheim II** have been completely shut down in a bid to end the country's reliance on energy that is perceived as dangerous and unsustainable.

Topic 30. HOW SHORT-BEAKED ECHIDNAS BEAT THE HEAT

Important for subject :Environment

With about 100 mucous secreting glands, this Australian mammal blows snot bubbles to bring down its body temperature.

- Short-beaked echidnas of the semi-arid Dryandra Woodland in Western Australia face searing hot summers. They can't pant like dogs to cool off since their long, thin, sticky tongues are useful only to feed. Neither do they sweat as we do. Nor do they lick their arms like kangaroos whose evaporating saliva cools the underlying blood vessels. Vultures squirt watery poop on their naked legs for the same reason.
- Just as **the thorns of cacti reduce heat loss, so do the two-inch-long spines of echidnas.** When the quills are slicked back, they trap warmth. **When they are raised, heat escapes.** Another strategy of the domestic cat-sized animals is to **lie flat, pressing their spineless stomachs to the cool soil** with their legs and noses stretched

out. The pencil-thin, three-inch tubular snout is the egg-laying mammal's prey detection kit. It is **covered with electroreceptors** that detect the underground wrigglings of ants, termites, and grubs. These **sensors work only when they are moist**. For this reason, the echidna's nose has about 100 mucous secreting glands.

- Viewed through a **thermal camera**, the **echidna's pointy nose appears blue, much cooler than the rest of its body**, which glows in the warm colours of orange, pink and red. When a hot animal blows mucus balloons that burst over its nose, evaporation cools the blood vessels inside the snout**. Circulating this blood through the body brings down the body temperature.**

Echidnas:

- Echidnas, also known as **spiny anteaters**, are small**, egg-laying mammals** found in Australia and New Guinea. They are **one of only two extant monotremes** (the other being the platypus) which are mammals that l**ay eggs instead of giving birth to live young**.
- Echidnas are **covered in spines**, which protect them from predators. They use their **strong claws to dig into the ground** and create burrows where they can rest during the day.
- They have a **long, sticky tongue** that they **use to capture insects and other small prey**. They do not have teeth, so they grind up their food with keratinous pads in their mouths.
- Female echidnas lay a single leathery egg, which hatches after about 10 days. The young, called puggles, are **born without spines** and are c**arried in a pouch on the mother's belly until they are able to survive** on their own.
- Echidnas are important to the ecosystem because they **help to control insect populations.**
- However, echidnas are facing threats from habitat loss and fragmentation, vehicle collisions, and predation by introduced predators such as foxes and cats. Climate change is also a potential threat, as it may affect the availability of insects, which are a major food source for echidnas. Echidnas are **listed as Least Concern on the IUCN Red List of Threatened Species**, but some subspecies are considered to be vulnerable or endangered.

Topic 31. SPOT BILLED PELICAN AND PULICAT LAKE

Important for subject : Environment

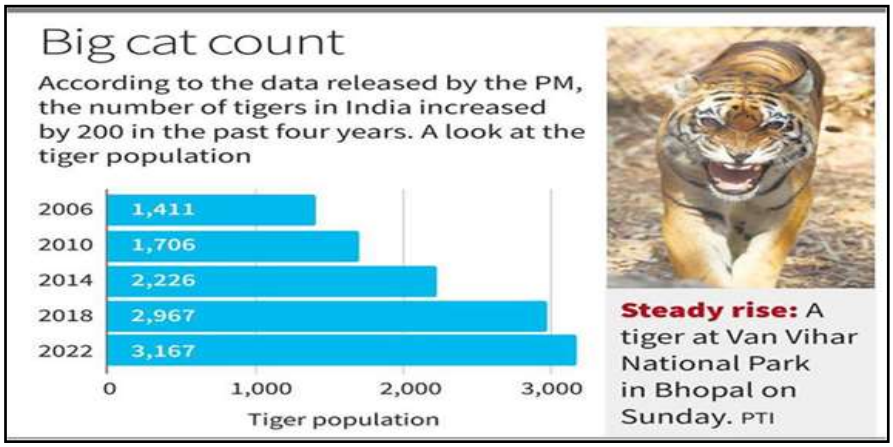
About Spot Billed Pelican

- The Spot-billed Pelican is a **large water bird found in India and other parts of Southeast Asia.**
- It is the **only pelican species that is known to breed in India**, and it is **listed as Near Threatened on the IUCN Red List** due to habitat loss and hunting**.**
- The Spot-billed Pelican can be **found in wetlands, lakes, rivers, and estuaries, where it feeds on fish, frogs, and other aquatic prey.**
- They have weak leg muscles which is not ideal for, therefore they catch fish near the surface of the water.
- This species sometimes goes fishing in groups, forming a semi-circle that pushes the fish towards shallow water. It also forms a foraging partnership with the little cormorant.
- Cormorants are divers, and their dives cause the fish present in deeper regions to scatter towards the surface, where the pelican awaits them.
- Adult spot-billed pelicans weigh 4.5-5 kg. The pouch, which is called the gular, is for catching fish.
- **Spot-billed pelicans form stable colonies along with other water birds**. Nests are built on trees, and two-three eggs are laid. When they are about a month old, the chicks destroy the nests.
- Breeding colonies occur very close to, or even within villages. Villagers use the droppings of the spot-billed pelican as a fertiliser.
- After the breeding season, pelican populations scatter over a very large area as they forage for food.
- The best places to spot the Spot-billed Pelican in India are the **Keoladeo National Park in Rajasthan, Pulicat Lake, Andhra Pradesh, the Vedanthangal Bird Sanctuary in Tamil Nadu, Chilika Lake in Odisha, Kokkare Bellur and Karanji Lake in Karnataka**. **Pulicat Lake**
- Pulicat Lagoon is the **second largest brackish water lagoon in India**, **after Chilika Lake**. It is present in the Coromondal Region i.e. **Andhra Pradesh–Tamil Nadu Border**.

- The **barrier island of Sriharikota separates the lake from the Bay of Bengal** and is home to the Satish Dhawan Space Centre.
- The lake **encompasses the Pulicat Lake Bird Sanctuary**.
- **Flamingo Festival is held every year to** promote tourism in Pulicatlake and Nellapattu. It has been organised for the past 12 years
- The primary inflows to the Pulicat Lake are **Arani, Kalangi and Swarnamukhi**.
- About **96% of the Pulicat Lake is present in Andhra Pradesh while only 3% is present in Tamil Nadu.**
- The Buckingham Canal, a navigation channel, is part of the lagoon on its western side.

Topic 32. TIGER CENSUS 2022

Important for subject: Environment



Tiger Census 2022: India's tiger population increased by 200 in last four years.

The tiger population numbers were made public by Prime Minister at an event to mark the International Big Cat Alliance conference as well as the 50th anniversary of Project Tiger

Census Findings:

- The tiger population in India **grew by 200 from 2018 to 2022**, according to the fifth cycle of the All India Tiger Estimation (2022).
- The number of tigers in India was **3,167 in 2022, up from 2,967 in 2018**, the report showed.
- The **growth**, however, **slowed to 6.7 per cent** in these four years from around 33 per cent during 2014-2018, analysis of the latest data showed.
- The tiger population has grown the **most in the Shivalik hills and Gangetic flood**

plains, followed by **central India, the north eastern hills, the Brahmaputra flood plains**, and the Sundarbans. There was a **decline in the Western Ghats numbers, though "major populations" were said to be stable**.

- **Decline in tiger occupancy** was also observed outside the protected areas of **Anamalai-Parambikulam complex**. Although the tiger populations in the Periyar landscape remained stable, the tiger occupancy has declined outside Periyar.
- Tiger occupancy in **Jharkhand, Odisha, Chhattisgarh and Telangana** showed a decline.
- The **genetically unique and small population of tigers in Simlipal** is of high conservation priority in the landscape.
- The **northeastern hill tiger populations are genetically unique** and should be the top priority of conservation action in the country due to their low population size and genetically unique lineage
- With **tigers increasing outside Tiger Reserves** in the landscape (Shivalik hills and Gangetic plains), Uttarakhand and Uttar Pradesh need to invest in mitigating conflict with tigers and mega herbivore.
- The wildlife habitats (Protected Areas and corridors) within this region (Central Indian highlands and Eastern Ghats) face a range of threats, including **habitat encroachment, illegal hunting of both tigers and their prey**, conflicts between humans and wildlife, unregulated and illicit cattle grazing, excessive harvesting of non-timber forest produce, human induced forest fires, mining, and ever-expanding linear infrastructure. This region is also having several mines of important minerals, hence mitigation measures like lower mining impact techniques and rehabilitation of mining sites should be done on priority.

Tiger census

- The national tiger census is conducted **once every four years**.
- The Nation-wide tiger census was earlier held in 2006, 2010, 2014, 2018.
- The **National Tiger Conservation Authority**(NTCA) conducts tiger censuses in partnership with state forest departments, conservation NGOs, and the Wildlife Institute of India (WII).

Census methodology

- **Double sampling based on ground-based surveys and actual images**captured on camera-traps.
- Double sampling method was **introduced in 2006 after the "pugmark" surveys**were found to be inaccurate.
- In 2018 census, 83% of the big cats censused were individually photographed using camera traps.
- In **Phases 1 & 2, ground-based surveys** were carried out by Forest Department officials to collect signs of tiger presence like scat and pugmarks.
- In **phase 3,**the information was plotted on the forest map prepared with remote-sensing and GIS (**MSTrIPES**).
- In the last phase, data were extrapolated to areas where cameras could not be deployed.

Topic 33. THEPPAKKADU ELEPHANT CAMP

Important for subject: Environment

- **Mudumalai Tiger Reserve**, **Theppakadu Elephant camp** is the oldest elephant camp in 'Asia. This elephant camp was established 100 years before. This elephant camp having
- 28 elephants including 2 calves at present. In this elephant camp elephants are mainly used in Human- Wild animal conflicts, Forest Mansoon patrolling, eco-tourism, elephant conservation, Education etc.
- The Elephant camp is located on the bank of the **river Moyar**, opposite to the Reception center.

Topic 34. OVER HALF OF HEAVY INDUSTRY EYEING LOW CARBON HYDROGEN

Important for subject : Environment

As many as **62% of heavy industry companies across sectors are looking at low-carbon hydroge**n to replace carbon-intensive systems, says a **new report from the Capgemini Research Institute.**

The report, "**Low-Carbon Hydrogen – A Path to a Greener Future**," also found that on average, Energy and Utilities (E&U) companies expect low-carbon hydrogen to meet 18% of

total energy consumption by 2050.

Green Hydrogen

- It is a **colourless, odourless, tasteless, non-toxic and highly combustible** gaseous substance.
- Hydrogen is the lightest, simplest and most abundant member of the family of chemical elements in the universe.
- **Future hydrogen**: The colour — green — prefixed to it makes hydrogen the "fuel of the future".
- The 'green' depends on how the electricity is generated to obtain the hydrogen, which does not emit greenhouse gas when burned.
- Green hydrogen is **produced through electrolysis using renewable sources of energy such as solar, wind or hydel power.**

Uses:

- **Chemical industry**: Manufacturing ammonia and fertilisers.
- **Petrochemical industry**: Production of petroleum products.
- Furthermore, it is starting to be used in the steel industry, a sector which is under considerable pressure in Europe because of its polluting effect.

Other Types of Hydrogen:

- **Brown Hydrogen**: Most of the gas that is already **widely used as an industrial chemical** is either brown, if it's made through the **gasification of coal or lignite**.
- **Grey Hydrogen**: If it is made **through steam methane reformation**, which typically uses **natural gas as the feedstock**. Neither of these processes is exactly carbon-friendly.
- **Blue Hydrogen**: Where the gas is **produced by steam methane reformation** but the **emissions are curtailed using carbon capture and storage.**

Topic 35. RADIOACTIVE CONTAMINATION INCREASINGLY FOUND IN SCRAPS FOR RECYCLING

Important for subject: Environment

Radioactive contaminated metal, if used to manufacture household goods, could pose a potential health problem to unsuspecting consumers: International Atomic Energy Agency.

- Radioactive materials or contaminated devices are entering into the booming scraps recycling chain, **posing a grave health hazard**, according to the annual data on illicit trafficking of nuclear and other radioactive material released by the
- **International Atomic Energy Agency (IAEA).**
- The latest data has been extracted from the IAEA Incident and Trafficking Database (ITDB), where some 143 member states and international agencies report **incidents of illicit trafficking of nuclear and other radioactive material** under or out of regulatory control.
- The **annual number of reported incidents of this kind over the last decade has averaged at around 131 incidents per year** according to the IAEA dataset.
- **Radioactive-laced waste products**— including vehicles like ships — is **being increasingly recycled without taking care of the hazard gains credence** from the fact that during 1993-2022, more than half of incidents reported under this group were not from radioactive sources.
- Only 10 per cent of all such incidents involved enriched uranium, plutonium and plutonium-beryllium neutron sources. Even for this, many incidents involved scrap metals with high enriched uranium landing up in scrapyards.
- The most **common source of such contamination is the feed material** (in most cases, metal) from which the product had been manufactured.
- Much feed material is often obtained from the metal recycling industry and, in the process of being melted down, can **become contaminated with material from an undetected radioactive source such as cobalt-60**.
- The resulting contaminated metal, **if used to manufacture household goods, could pose a potential health problem** to unsuspecting consumers.

International Atomic Energy Agency

- Widely known as the world's "**Atoms for Peace and Development**" organization **within the United Nations family**, the IAEA is the international centre for cooperation in the nuclear field.
- The IAEA was **created in 1957** in response to the **deep fears and expectations generated by the discoveries and diverse uses of nuclear technology**.
- Headquarter: **Vienna, Austria.**

Objective:

- The Agency works with its Member States and multiple partners worldwide to **promote safe, secure and peaceful use of nuclear technologies**.
- In 2005, it **was awarded the Nobel Peace Prize** for their work for a safe and peaceful world.

Board of Governors:

- **22 member states** (must represent a stipulated geographic diversity) — elected by the General Conference (11 members every year) – 2 year term.
- At least 10 members states — nominated by the outgoing Board.
- Board members each receive one vote.

Functions:

- It is an **independent international organization that reports annually to the United Nation General Assembly**. When necessary, the IAEA **also reports to the UN Security Council** in regards to instances of members' non-compliance with safeguards and security obligations

Topic 36. NEW FROG SPECIES FOUND IN MEGHALAYA SIJU CAVE

Important for subject: Environment

A team of researchers from Zoological Survey of India found Amolops siju in Siju cave in 2020

- The newest croaker recorded in India is a **dark cave dweller**, unlike most members of the Ranidae family belonging to Amolops, a genus of true frogs.
- Scientists from the Shillong and Pune units of the **Zoological Survey of India (**ZSI)

have **named the new species Amolops siju after the Siju cave system of Meghalaya**, from where four specimens were collected. Two of them, including a gravid female, were found in a dark zone of the cave near a chamber of bats.

- This is the **second cave-dwelling species of frog recorded from India after Micrixalus spelunca in Tamil Nadu** nine years ago. **Amolops siju**
- It has been **named after the Suji cave** where it was discovered.
- It belongs to the **cascade Ranidae family** and genus Amolops.
- Genus Amolops is **among the largest groups of ranid frogs** (family Ranidae) with 73 known species widely distributed across India's North East and north, Nepal, Bhutan, China, the Indochina region and the Malaya Peninsula.
- Cascade frogs are named so **because they prefer small waterfalls.** The Amolops siju is a **relatively small frog**, with a length of **around 2.5 cm.**
- It is **brown in colour** and has a narrow snout. The frog is a **semi-aquatic species** and is found in the streams that flow inside the Siju Cave.
- Siju Cave, also known as **Bat Cave**, is a cave located in **Meghalaya**, India. It is the **third longest natural cave** in the Indian subcontinent and is famous for its large bat population.
- It is a 4 km long **natural limestone cave**.

Zoological Survey of India

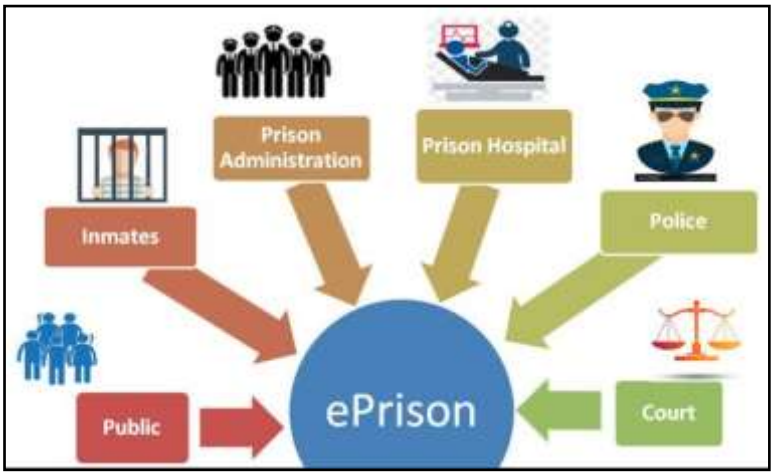
- Zoological Survey of India (ZSI) is an organization **under the Ministry of Environment, Forest and Climate Change**, Government of India. It was established in **1916** and is **headquartered in Kolkata, West Bengal**.
- ZSI has **regional centers located** in various parts of India, including Andaman & Nicobar Islands, Port Blair, Dehradun, Jabalpur, Pune, Shillong and Kolkata.
- It also has a **Marine Biology Regional Centre located in Chennai, Tamil Nadu**.
- The primary objective of ZSI is to **promote the survey, exploration, research and documentation** on various aspects of animal taxonomy in the Indian subcontinent.
- It also **provides expert advice and assistance to the Central and State Governments** in matters related to conservation of wildlife and forests.
- Some of the key functions of ZSI include:
- **Conducting surveys and collecting data** on the distribution, abundance and status of

various animal species in India.

- **Identifying and classifying newly discovered animal species** and conducting taxonomic studies.
- **Developing and maintaining a National Zoological Collection**, which comprises specimens of animal species found in India.
- **Undertaking research on animal taxonomy**, ecology, biogeography and biodiversity conservation.
- **Providing expert advice** to the Government on wildlife and biodiversity conservation issues.
- **Collaborating with other national and international organizations** involved in wildlife and biodiversity conservation.

Topic 37. MHA TO PROVIDE FINANCIAL ASSISTANCE FOR PRISONERS

Important for subject : Polity



Recently, Ministry of Home Affairs (MHA) has launched a scheme which envisages monetary aid to poor inmates who are unable to afford the penalty or the bail amount.

About the initiative:

- In line with one of the **announcements of the Union Budget**, '**Support for Poor Prisoners**', the scheme envisages financial support to poor persons.
- The scheme will enable underprivileged prisoners, majority of whom belong to socially disadvantaged or marginalised groups with lower education and income levels, to get out of prison.

- The technology-driven solutions were aimed and put in place to ensure that benefits reach the poor prisoners; **reinforcing the E-prisons platform**; **strengthening of District Legal Services Authority** and sensitisation and capacity building of stakeholders to ensure that quality legal aid is made available to needy poor prisoners.

Need of the initiative:

- According to **Prison Statistics India 2021**, a **report published by the National Crime Records Bureau (NCRB), Ministry of Home Affairs**, between 2016-2021, the number of convicts in jails decreased by 9.5 percent whereas the number of undertrial inmates increased by 45.8 percent.

E- prisons Project

- This project **aims at computerization of the functioning of prisons in the country**. It has been operationalised in all States and Union Territories.
- **e-Prisons data has been integrated with the Police and Court system** under **the Inter-operable Criminal Justice System.** ePrisons application suite has been **developed by National Informatics Centre (NIC), Ministry of Electronics & IT (MeitY).**

It has 3 components:

- **e-Prison Management Information System** (MIS): It is used at the prisons for their day to day regular activities.
- **National Prisons Information Portal:** It is a citizen centric portal showing statistical data of various prisons in the country.
- **Kara Bazaar**: Portal for showcasing and selling the products manufactured in various prisons of the country by inmates.
- **Inter-operable Criminal Justice System:**
- It is a **common platform for information exchange and analytics of all the pillars of the criminal justice system** comprising Police, Forensics, Prosecution, Courts, Prisons.
- **Purpose**: To reduce errors and time taken in sharing of necessary information between the pillars, which often lead to larger challenges like longer duration of trials, poorer convictions, transit losses of documents etc.

- Some other critical benefits arising out of the ICJS ecosystem are usable analytic products like the National Database on Sexual Offenders (NDSO) to identify & track repeat and habitual sexual offenders.

Other Government Interventions:

- **Modernization of Prisons scheme**: The scheme for modernisation of prisons was launched in 2002-03 with the objective of improving the condition of prisons, prisoners and prison personnel.
- **E-Prisons Project:** The E-Prisons project aims to introduce efficiency in prison management through digitization.
- **Model Prison Manual 2016**: The manual provides detailed information about the legal services (including free services) available to prison inmates.
- **National Legal Services Authority (NALSA):** It was constituted under the Legal Services Authorities Act, 1987 which came into force on 9th November, 1995 to establish a nationwide uniform network for providing free and competent legal services to the weaker sections of the society.

Topic 38. SC TO HEAR IDENTIFICATION OF MINORITIES AT STATE LEVEL

Important for subject : Polity

- The Supreme Court is scheduled to hear on Monday a batch of pleas seeking the identification of minorities at the state level.
- A bench of justices Sanjay Kishan Kaul and Ahsanuddin Amanullah will take up for hearing the petitions raising various issues related to the identifiation of minorities, including challenging the **constitutional validity of the National Minority Commission Act, 1992 and the National Commission for Minorities Educational Institutes Act, 2004.**
- The pleas include the one filed by advocate Ashwini Upadhyay who has sought directions for **framing guidelines for the identification of minorities at the state level, contending that Hindus are in minority in 10 states.**
- **How is a community notified as a minority?**
- Under Section 2(c) of the National Commission for Minorities Act of 1992 **central government has the power to notify a community as a minority**
- **Notified Minorities in India**

- Currently, only those communities notified under **section 2(c) of the NCM Act, 1992, by the central government are regarded as minority.**
- In 1993, the first Statutory National Commission was set up and five religious communities viz. The Muslims, Christians, Sikhs, Buddhists and Zoroastrians (Parsis) were notified as minority communities.
- In 2014, Jains were also notified as a minority community.

Constitutional Provisions for Minorities

Article 29

- It provides that any section of the citizens residing in any part of India having a distinct language, script or culture of its own, shall have the right to conserve the same.
- It grants protection to both religious minorities as well as linguistic minorities

Article 30:

- All minorities shall have the right to establish and administer educational institutions of their choice.
- The protection under Article 30 is confined only to minorities (religious or linguistic) and does not extend to any section of citizens (as under Article 29).

Article 350-B:

- The 7th Constitutional (Amendment) Act 1956 inserted this article which provides for a Special Officer for Linguistic Minorities appointed by the President of India.
- It would be the duty of the Special Officer to investigate all matters relating to the safeguards provided for linguistic minorities under the Constitution.
- **Judgements related to determination on minority status**

TMA Pai Case:

- The SC had said that for the purposes of Article 30 that deals with the rights of minorities to establish and administer educational institutions, religious and linguistic minorities have to be considered state-wise.

Bal Patil Case:

- In 2005, the SC in its judgement in 'Bal Patil' referred to the TMA Pai ruling.
- The legal position clarifies that henceforth the unit for determining status of both linguistic and religious minorities would be 'state'.

Topic 39. PUBLIC INTEREST IMMUNITY CLAIM PROCEDURE

Important for subject : Polity

The Supreme Court has expressed dissatisfaction with so-**called "sealed cover jurisprudence" and has developed a process for "public interest immunity claims**" as a less restrictive option for handling claims containing state secrets.

Background

- The Kerala High Court's decision upholding the order from the Information and Broadcasting Ministry decision to block MediaOne, a Malayalam news channel, from airing its programming was overturned by the Supreme Court.
- The High Court's ruling was based on information that the Home Ministry had only disclosed to it in a "sealed cover."
- The Supreme Court has frequently expressed dissatisfaction with so-called "sealed cover jurisprudence" and has **developed a process for "public interest immunity claims"** as a less severe option for handling state secret cases.

Public interest immunity claim

- The Supreme Court ruled that the following criteria must be **used to determine whether a claim concerning issues of national security is valid**:
- Whether there is sufficient evidence to conclude that information secrecy serves the interests of national security.
- Whether a reasonable person would make the same conclusion from the evidence.
- The court suggested that secret elements of the document be censored and a summary of the document's contents be supplied to fairly exclude materials following a successful public interest immunity claim.

Topic 40. STATES SUBSIDY ACCOUNTING MUST BE TRANSPARENT – CAG

Important for subject : Polity

The Comptroller & Auditor General (CAG) of India, Girish Chandra Murmu, on Monday said the **States must take measures to maintain proper accounting of subsidies, reduce fiscal deficits, remove revenue deficits and keep outstanding debts at an acceptable level.**

- There are fiscal sustainability risks and financial indiscipline in many States due to **off-budget borrowings, misclassification of revenue expenditure as capital expenditure** and because **state guarantees are not getting captured in finance accounting**
- These factors make qualitative and timely preparation of accounts by the CAG difficult.
- **Constitutional Mandate**
- **Article 150 of the Constitution** mandates that the accounts of the Union and of the States has to be kept in a manner as prescribed by the President on the CAG's advice.
- **Section 10 of the Duties, Powers and Services Act** also **empowers the CAG to compile accounts of the central and State governments.**
- **Integrated Financial Management System (IFMS)**
- It is a web-based solution designed to bring efficiency in financial planning and expenditure control in the States.
- This portal has brings various **stakeholders such as Department of Finance, Treasuries, Administrative Departments, Accountant General (AG), RBI and Banks on a single platform** with role based Smart Dashboards.
- Smart Dashboards have provided a better Decision Support System to all the stakeholders.

Public Financial Management System (PFMS)

- The Public Financial Management System (PFMS), earlier known as Central Plan Schemes Monitoring System (CPSMS), is a **web-based online software application developed and implemented by the Office of Controller General of Accounts (CGA), Ministry of Finance.**
- PFMS was initially started during 2009 as a Central Sector Scheme of Planning

Commission with the objective of tracking funds released under all Plan schemes of the Government of India, and real time reporting of expenditure at all levels of Programme implementation.

- Subsequently in the year **2013, the scope was enlarged to cover direct payment to beneficiaries under both Plan and non-Plan Schemes.**
- In **2017, the Government scrapped the distinction between plan and non-plan expenditure.**
- The primary **objective of PFMS is to facilitate a sound Public Financial Management System for the Government of India (GoI) by establishing an efficient fund flow system as well as a payment cum accounting network.**
- At present, the **ambit of PFMS coverage includes Central Sector and Centrally Sponsored Schemes as well as other expenditures including the Finance Commission Grants.**
- PFMS provides various stakeholders with a **real time, reliable and meaningful management information system** and an **effective decision support system**, as part of the Digital India initiative of GoI.
- **PFMS** is **integrated with the core banking system in the country**.
- Implementation of the Public Financial Management System (PFMS) by the Central government had wide implications for State accounting so far as sanctions of State grants, funds transfer and monitoring were concerned.

Topic 41. ABUSE OF PREVENTIVE DETENTION LAW

Important for subject : Polity

- Recently, the **Supreme Court (SC) of India observed that preventive detention laws in India are a colonial legacy** that confers arbitrary power to the state.
- The Court **warned that these laws are extremely powerful and have the potential to provide the state with free discretion.**

Preventive Detention

- Preventive detention means **detention of a person without trial and conviction by a court.** Its purpose is **not to punish a person for a past offence but to prevent him from committing an offence i**n the near future.
- The detention of a person cannot exceed three months unless an advisory board

reports sufficient cause for extended detention.

Protection:

- **Article 22 grants protection to persons who are arrested or detained.**
- Article 22 has two parts—the **first part deals with the cases of ordinary law** and the **second part deals with the cases of preventive detention law**.

Two Types of Detentions:

- **Preventive detention** is when a person is held in police custody only on the basis of a suspicion that they would conduct a criminal act or cause harm to society.
- The police have the authority to hold anyone they suspect of committing a criminal offence and also to make arrests without a warrant or a magistrate's authorization in certain cases.
- **Punitive detention**, which means detention as a punishment for a criminal offence.
- It occurs after an offence is actually committed, or an attempt has been made towards the commission of that crime.

Topic 42. RULES FOR RECOGNITION AS A NATIONAL PARTY

Important for subject : Polity

On April 10th, 2023, the **Aam Aadmi Party (AAP) was accorded the status of a national party by the Election Commission of India (ECI).**

- However, other parties such as the **Trinamool Congress (TMC), the Communist Party of India (CPI), and the Nationalist Congress Party (NCP) have lost their national party status.** The ECI **also revoked the recognition of some parties as State parties.**

What is a national party?

- A national party refers to such a political party that has a **presence "nationally", whereas the presence of regional parties is limited to a particular state or region.**
- National parties are usually India's bigger parties, such as the Congress and BJP and a certain stature is associated with being a national party.
- According to the **Representation of People Act 1951**, registered **political parties**

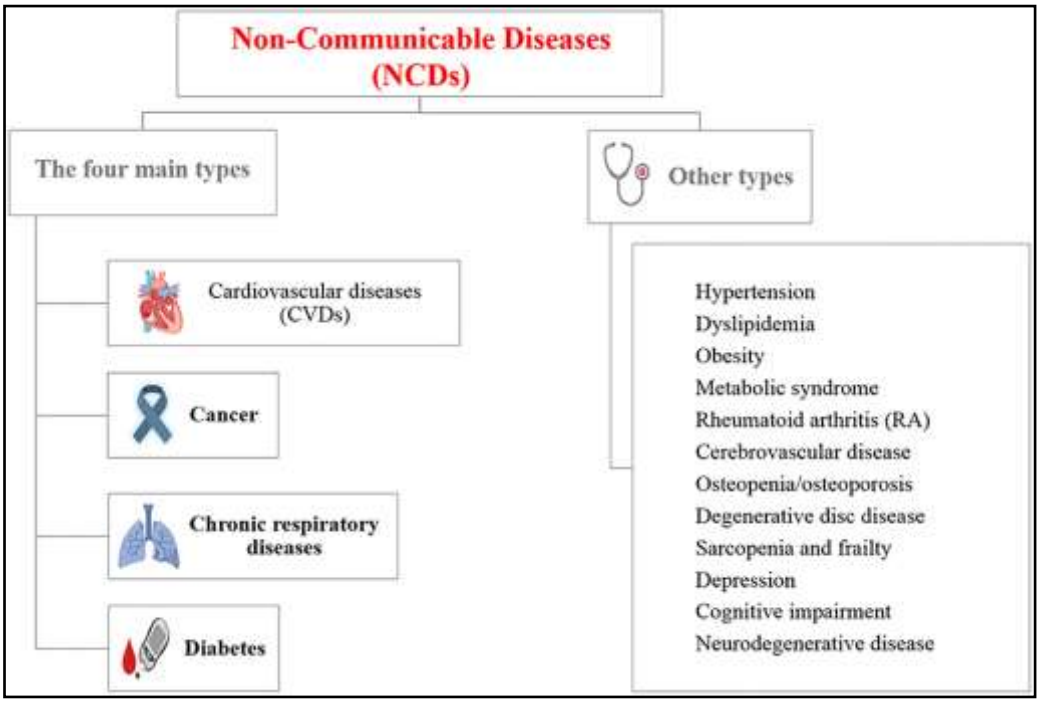
can get recognition as "State" or "National" parties in the due course of time.

- At present, **there are six parties in India with the status of a "national party" including** the BJP, Congress, Bahujan Samaj Party (BSP), CPI(M), National People's Party (NPP) and the AAP.
- **Criteria to be recognised as a "national party"**
- The ECI **reviews the performance of recognised parties after every State Assembly election and general election to the Lok Sabha i**n order to accord the status of "State Party" or "National Party".
- The rules for recognition as a national party are specified by the ECI in **para 6B of the Election Symbols (Reservation and Allotment) Order, 1968.**
- According to the order, a registered party will be eligible to be accorded national status if it manages to:
- Be **recognised as a "State party" in four or more States**; or **Secure at least 6% of the total votes polled in any four States in the last Lok Sabha** or Assembly elections, and in addition, has a **minimum of four of its members elected to the Lok Sabha; or** Wins **at least 2% of seats in the Lok Sabha from not less than three States**.
- The **Symbols Order of 1968 was amended in 2016 to give parties one additional "pass over".**
- According to the amendment, which is in force since January 1, 2014, if a **national or State party fails to meet the eligibility rules in the next general election**s (i.e. 2014 Lok Sabha polls) or the Assembly election after the election in which it was recognised, the **party shall remain to be recognised as a national or State party, i.e. it will not be stripped of its status.**
- However, **whether it will continue to be recognised after any subsequent election would again have to be determined by the eligibility criteria.**
- **Criteria to be recognised as a "State party"** A party has to **secure at least 6% of the valid votes polled and two seats in Assembly polls or one in Lok Sabha polls**; or At a General Election or Legislative Assembly election, **the party must have won at least 3% of the seats in the legislative assembly of the State** (Important for subject to a minimum of 3 seats); or
- At a Lok Sabha General Elections, the **party must have won at least one Lok Sabha**

seat for every 25 Lok Sabha seats allotted for the State; or At a General Election to the Lok Sabha or the Legislative Assembly, the **party must have at least 8% of the total valid votes polled.**

Topic 43. NONCOMMUNICABLE DISEASES CAUSE 40% OF HOSPITALIZATION

Important for subject : Schemes



What are NCDs?

- Noncommunicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behavioural factors. The main types of NCD are cardiovascular diseases (such as heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes.
- NCDs disproportionately affect people in low- and middle-income countries, where more than three quarters of global NCD deaths (31.4 million) occur.
- **National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS)** National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke (NPCDCS) was launched in 2010 in 100 districts across 21 States, **in order to prevent and control the major NCDs**.

- The main focus of the programme is on health promotion, early diagnosis, management and referral of cases, besides strengthening the infrastructure and capacity building.

Main strategies of the programme:

- Health promotion through behavior change with involvement of community, civil society, community-based organizations, media etc.
- Outreach Camps are envisaged for opportunistic screening at all levels in the health care delivery system from sub-centre and above for early detection of diabetes, hypertension and common cancers.
- Management of chronic Non-Communicable diseases, especially Cancer, Diabetes, CVDs and Stroke through early diagnosis, treatment and follow up through setting up of NCD clinics.
- Build capacity at various levels of health care for prevention, early diagnosis, treatment, IEC/BCC, operational research and rehabilitation.
- Provide support for diagnosis and cost-effective treatment at primary, secondary and tertiary levels of health care.
- Provide support for development of database of NCDs through a robust Surveillance System and to monitor NCD morbidity, mortality and risk factors.

Funding:

- The funds are being provided to States under NCD Flexi-Pool through State PIPs of respective States/UTs, with the Centre to State share in ratio of 60:40 (except for North-Eastern and Hilly States, where the share is 90:10).

NCDs:

- No communicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behaviours factors.
- The main types of NCDs are cardiovascular diseases (like heart attacks and stroke), cancers, chronic respiratory diseases (such as chronic obstructive pulmonary disease and asthma) and diabetes.

Topic 44. NATIONAL MISSION FOR MAPPING CULTURE

Important for subject :Schemes

National Mission for Cultural Mapping with the mandate to map rural India's cultural assets has covered over one lakh villages.

- The entire exercise has been carried out **under the Mera Gaon Meri Dharohar**
- **(My Village My Heritage) programme of the National Mission for Cultural Mapping (NMCM).**

About the NMCM Mission

- The NMCM aims to develop a **comprehensive database of art forms, artists and other resources across the country.**
- The Culture Ministry had approved the mission in 2017 with a **₹469 crore budget from 2017-2018 to 2019-2020.**

Objectives of the Mission

- Under this Mission, at broad-level, there are three important objectives as follows:
- **National Cultural Awareness Abhiyan**: Hamari Sanskriti Hamari Pahchan Abhiyan (Our Culture Our Identity)

- **Nationwide Artist Talent Hunt/Scouting Programme**: Sanskritik Pratibha Khoj Abhiyan
- **National Cultural Workplace**: Centralised Transactional Web Portal with database and demography of cultural assets and resources including all art forms and artists.

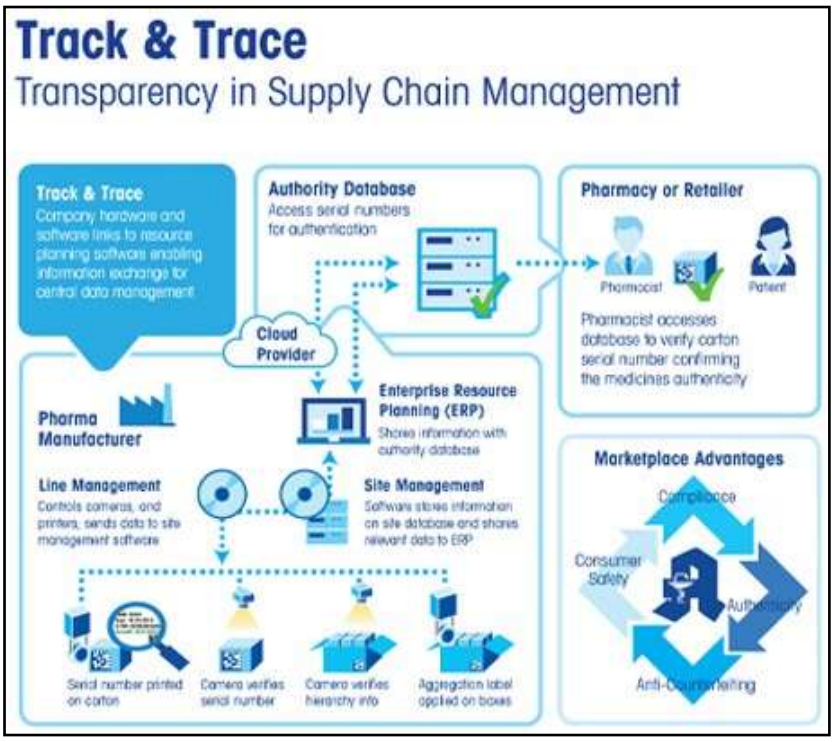
Implementation

- In this cultural asset mapping, **villages have been broadly divided into seveneight categories** based on whether they are important ecologically, developmentally or scholastically, if they produce a famous textile or product, and if they are connected to some historical or mythological events such as the
- Independence struggle or epics like the Mahabharata.
- The **Indira Gandhi National Centre for Arts (IGNCA) has undertaken the cultural asset mapping of these villages through field surveys.**
- The survey documents the cultural identity of the villages by involving citizens to share what makes their village, Block or district unique.

- The survey process **involves a CSC Village Level Entrepreneur (VLE) conducting meetings with locals a**nd **then uploading interesting facts** about their village, its places of interest, customs and traditions, famous personalities, festivals and beliefs, art and culture, etc., on to a special application.
  - The IGNCA **plans to cover all the 6.5 lakh villages in the country**.

Topic 45. DRUG MAKERS GET MORE TO TIME TO JOIN 'TRACK AND TRACE SYSTEM'

Important for subject : Schemes



- Drug makers have got another extension from DGFT, this time up to August 1, to help implement the Track and Trace system for export of pharmaceuticals consignments.
- Manufacturers granted time for ensuring that data about maintaining parent-child relationship in packaging levels for export of drug formulations is uploaded on the central portal.

Track and Trace System

- The **pharmaceutical track and trace system** is a **logistical technology that allows drugs to be tracked and located along the supply chain.**
- To secure the domestic pharmaceutical supply chain, **Turkey became the first country in the world to adopt an end-to-end pharmaceutical track and trace system in 2012**.
- Following the successful installation, **countries such as Argentina and Saudi**
- **Arabia began to implement the drug tracking and tracing system. China, the**

United States, and European Union member countries are also working to develop an end-to-end pharmaceutical track and trace system. India is also in the process of developing its own system

- The Indian government has granted drug producers another delay until August 1 to establish the Track and Trace system for pharmaceutical export consignments.
- The **Track and Trace system was developed for at least eight years** to address issues such as counterfeit pharmaceuticals and product recalls.
- The latest extension was granted after the **Pharmaceuticals Export Promotion Council** of India (Pharmexcil) cited difficulty in adopting the system.
- The **Track and Trace system will first cover secondary and tertiary packaging**, with the main packaging coming later.

Pharmaceutical Export Promotion Council of India

- Pharmaceutical Export Promotion Council of India (Pharmexcil) is a **promotion body set up by the Ministry of Commerce and Industry, Government of India.**
- It was set up to promote the Indian pharmaceutical industry.

The roles of the council are

1. To advise the government,
2. To organize seminars and meetings on export-related issues,
3. To organize business meetings in India and abroad
4. To organize trade delegations.

Topic 46. LIVESTOCK INSURANCE SCHEME

Important for subject :Schemes

According to information by a **Parliamentary Standing Committee** (PSC) regarding zero insurance coverage of livestock in 2022-23, the **Centre is considering a comprehensive livestock insurance scheme modelling the Prime Minister's Fasal Bima Yojana.**

Findings of the Parliamentary panel:

- At present, less than 1% of the country's cattle population is insured and the average yearly premium is 4.5% of the insured amount.
- The report also highlighted that not even a single livestock was insured during 2022-

23, whereas during 2021-22, 1, 74,061 animals were insured.

- The Committee asked Department of Animal Husbandry to explore the possibility of developing an App-based Livestock Insurance facility for livestock owners.
- Committee noted that high policy premium rates and general economic conditions of farmers are reasons for lower enrolment in such schemes.

About Livestock Insurance scheme:

- The Livestock Insurance Scheme, a **centrally sponsored scheme** was implemented on a pilot basis **during 2005-06 and 2006-07.**
- The scheme was later **implemented on a regular basis from 2008-09 in 100 newly selected districts of the country.**
- The scheme was later subsumed under the **Sub-mission on 'Innovation and Extension: on livestock development of National Livestock Mission'.**
- **Coverage:** The scheme is implemented in all the districts of the Country from 21.05.2014.

Animals covered:

- The indigenous/crossbred milch animals, pack animals (Horses, Donkey, Mules, Camels, Ponies and Cattle/Buffalo Males), and Other Livestock (Goat, Sheep, Pigs, Rabbit, Yak and Mithun etc.) are covered under the purview of this component.
- **Livestock Related Facts**
- India has rich Livestock resources which can be seen in the following manner:
- **World's highest livestock** owner at about 535.78 million
- **First in the total buffalo population** in the world – 109.85 million buffaloes
- **Second in the population of goats** – 148.88 million goats
- **Second largest poultry** market in the world
- The **second largest producer of fish** and also the **second largest aquaculture nation** in the world
- **Third in the population of sheep (74**.26 million)
- **Fifth in the population of ducks** and **chicken**s (851.81 million)
- **Tenth in camel population** in the world – 2.5 lakhs
- **Other Livestock related initiatives**

- **Rashtriya Gokul Mission** (RGM): To undertake a breed improvement programme for indigenous breeds so as to improve the genetic makeup and increase the stock.
- **E-PashuHaat Portal**: This portal connects breeders and farmers regarding the availability of quality bovine germplasm.
- **National Animal Disease Control Programme**: It has been launched for Foot and Mouth Disease (FMD) and Brucellosis with a total outlay of Rs.13,343crores to ensure 100% vaccination of cattle, buffalo, sheep, goat and pig population.
- **National Livestock Mission**: IT is for the intensive development of livestock, tiny livestock along with adequate availability of quality feed and fodder.
- **Livestock Health& Disease Control Scheme**: Assistance is provided for the prevention and control of animal diseases like Foot and Mouth Disease (FMD) etc.
- **Disease Protection of Livestock**: For livestock protection, the diagnostic kits against Japanese Encephalitis (JE) and Bluetongue (BT) diseases and Subviral Particle-based Infectious Bursal Disease Vaccine were developed.

Topic 47. AMBEDKAR CIRCUIT TRAIN

Important for subject: Scheme

- On April 14, 2023, the government of India launched the **first Ambedkar circuit tourist train,** which **will cover prominent places associated with the life of Dr. B.R. Ambedkar.**
- The '**Bharat Gaurav Tourist train**' is being operated under the '**Dekho ApnaDesh'**

initiative, which is aimed at promoting domestic tourism, and is a joint collaboration between the Ministries of Tourism and Railways.

- The eight-day tour will include visits to places associated with the life of Dr. Ambedkar such as New Delhi, Mhow, Nagpur and the sacred Buddhist sites of Sanchi, Sarnath, Gaya, Rajgir, and Nalanda.

Bharat Gaurav Scheme

- Launched in November 2021, under the scheme, **trains now have a third segment for tourism**. **Till now, the Railways had passenger segments and goods segments.**
- These **trains are not regular trains that will run as per a timetable but will be more on the lines of the Ramayana Express being run by the IRCTC**.
- It was **announced under the theme-based tourist circuit trains.** These trains will be **run by both private players and IRCTC**, in theme-based circuits.
- By theme-based tourism (circuits), the railways mean trains like Guru Kripa that go to all places related to Guru Nanak or a Ramayan-themed train to touch upon places related to Lord Ram.
- Anyone, from societies, trusts, consortia and even state governments can apply to take these trains and run them on special tourism circuits based on a theme.
- Service Provider will offer all-inclusive packages to tourists including rail travel, hotel accommodation, sightseeing arrangement, visit to historical/heritage sites, tour guides etc.

Dekho Apna Desh initiative

- Nodal Ministry: The **Ministry of Tourism**
- The scheme aims to **promote tourism and encourage people to explore therich cultural heritage and diversity of India.** The scheme is intended to offer financial help to tourists travelling to different parts of India.
- The government has set aside a substantial budget for the implementation of this scheme, which will be used to promote travel and build out tourist infrastructure around the nation. The scheme aims to increase domestic tourism in India and under this plan, around 50 destinations in the country will be developed and promoted to attract tourists.

Topic 48. BRO WORKING ON STRATEGIC INFRA PROJECTS TO AIDE BHUTAN'S GROWTH

Important for subject:Geography

- After taking up daunting projects in the higher reaches, the Border Roads Organisation (BRO) is executing strategic infrastructure assignments in Bhutan to aid its development.
- The initiatives assume importance given that Bhutan and China are also in talks over boundary issues especially near Doklam trijunction point which came up for discussion during Prime Minister Narendra Modi's meeting with the visiting Bhutanese King Jigme Khesar Namgyel Wangchuck, earlier this week.
- The BRO has commenced three projects in South Eastern Bhutan since last year. These include the rehabilitation of Khothakpa–Tshobaley road, construction of 68-km greenfield Nanglam–Dewathang road, besides development of Motanga industrial park.

Topic 49. CANNABIS CULTIVATION

Important for subject : Geography

Recently, a five-member committee of MLAs has been formed by the state government of Himachal Pradesh to conduct a thorough study of cannabis cultivation and submit a report within a month.

About Cannabis Cultivation:

- **Cannabis** refers to a **group of three plants with psychoactive properties**, known as

Cannabis sativa, Cannabis indica, and Cannabis ruderalis.

- Cannabis is made up of more than 120 components, which are **known as cannabinoids** but experts have a pretty good understanding of two of them, **known as cannabidiol (CBD) and tetrahydrocannabinol (THC).**
- The Mexican term '**marijuana' is frequently used in referring to cannabis leaves** or other crude plant material in many countries.
- The unpollinated female plants are called hashish. Cannabis oil (hashish oil) is a concentrate of cannabinoids obtained by solvent extraction of the crude plant material or of the resin.
- In **India farming of cannabis has been legalised in Uttarakhand, and controlled cultivation of cannabis is also being done in some districts of Gujarat, Madhya Pradesh and Uttar Pradesh.**

Legal Provisions in India

- The central law that deals with cannabis (weed or marijuana) in India is the **Narcotic Drugs and Psychotropic Substances Act, of 1985.**
- The NDPS Act **prohibits the sale and production of cannabis resin and flowers**, but the **use of leaves and seeds of the cannabis plant is permitted**
- The **states have the power to regulate and form the state rules for it.**

Topic 50. INDIA DECOMMISSION AGEING DAMS

Important for subject : Geography

Dams have affected new ways of land use and life so much that many societies cannot think of a life beyond them anymore

- Dams, especially the large ones, are **highly controversial** in India. But **the dependence of urban communities on embankments makes it challenging to decommission** the ones that have aged or might cause more damage.
- Dams have **destroyed vast swathes of natural forests, displaced millions of people, fuelled inter-state conflicts**, and are methane-emitting culprits and so on.
- But they have also changed the world order for Indian civilisations by evolving new ways of farming, urbanisation and industrialisation.
- This is the reason for the poor response from people when the Parliamentary

- Standing Committee on Water red-flagged dam safety issues in a report on March 20.
- The Parliamentary Committee has raised concerns over the **safety of ageing dams** that are more than 100 years old. Of the 5,745 large dams in the country, 5,334 are operational. Of these operational embankments, 2**34 have outlived their lifespan of 100 years.** Some are even older than 300 years.

Dam Rehabilitation and Improvement Project (DRIP)

- Dam Rehabilitation and Improvement Project (DRIP) is a **project launched by the Government of India in 2012** with the **aim of rehabilitating and improving the safety and operational performance of selected dams** in India.
- DRIP Phase II is co-financed by **World Bank (WB) and Asian Infrastructure**
- **Investment Bank (AIIB)** with US$250 million each.
- It is being **implemented by the Central Water Commission** (CWC) in association with the concerned state governments.
- The project aims to **rehabilitate and improve the safety and operational performance** of 223 dams in seven states – Kerala, Madhya Pradesh, Odisha,
- Tamil Nadu, Karnataka, Uttarakhand, and Jharkhand.
- A web-based tool called **Dam Health and Rehabilitation Monitoring Application (DHARMA)** has been developed to **capture important data for all dams** and use it for appropriate monitoring and development of rehabilitation protocols.
- Based on the success of DRIP, the **Ministry of Jal Shakti** initiated another externally funded Scheme DRIP Phase II and Phase III.
- The project includes the rehabilitation and improvement of the dam's structural and non-structural components, including spillway gates, embankments, and sluices.
- The project also focuses on the **strengthening of institutional capacities** and the improvement of dam safety monitoring, emergency management, and communitybased disaster risk management.
- DRIP is a significant **step towards ensuring the safety and sustainability** of India's dams, which play a crucial role in the country's water management and power generation.

Dam Safety Act, 2021:

- An Act to provide for the **surveillance, inspection, operation, and maintenance of the specified dam** for prevention of dam failure related disasters and to **provide for an institutional mechanism** to ensure their safe functioning and for matters connected therewith or incidental thereto.

Features of the act:

- The **National Committee on Dam Safety** will be constituted and will be chaired by the chairperson, Central Water Commission.
- **Functions** of the committee will **include formulating policies and regulations regarding dam safety standards and prevention of dam failures**, analyzing the causes of major dam failures, and suggesting changes in dam safety practices.
- **National Dam Safety Authority** (NDSA) to be headed by an officer, not below the rank of an Additional Secretary, to be appointed by the central government.
- The **main task of this authority includes implementing the policies formulated** by the National Committee on Dam Safety, resolving issues between State Dam Safety Organisations (SDSOs), or between an SDSO and any dam owner in that state, specifying regulations for inspection and investigation of dams.
- The NDSA will also provide accreditation to agencies working on construction, design, and alteration of dams.
- The act also envisages **constituting a State Dam Safety Organisation** (SDSO) whose functions will be to **keep perpetual surveillance, inspection, monitoring the operation and maintenance of dams**, keeping a database of all dams, and recommending safety measures to owners of dams.
- The owners of the specified dams are required to provide
- A **dam safety unit in each dam** to inspect the dams before and after the monsoon session, and during and after any calamity or sign of distress.
- An **emergency action plan,** and **carry out risk assessment** studies for each dam at specified regular intervals.
- A **comprehensive dam safety evaluation** of each dam, at regular intervals, through a panel of experts.

Facts for Prelims:

1. **Oldest Dam** in India Kallanai Dam(Tamil Nadu)
2. **Highest Dam** in India Tehri Dam (Uttarakhand)
3. **Longest Dam** in India Hirakud Dam (Odisha)
4. India ranks **third globally after China and the United States of America**, with 5334 large dams in operation.

Topic 51. TAIWAN STRAIT

Important for subject : Geography

Taiwanese President U.S. visit prompts military drills by China in Taiwan Strait.

Taiwan Strait

- The **Taiwan Strait is a 180-kilometer** (110 mi)-wide strait **separating the island of Taiwan and continental Asia.**
- The strait is **part of the South China Sea and connects to the East China Sea to the north.**
- Former names of the Taiwan Strait include the **Formosa Strait or Strait of Formosa**, from a dated name for Taiwan; the Strait of Fokien or Fujian, from the Chinese province forming the strait's western shore; and the Black Ditch, a calque of the strait's name in Hokkien and Hakka.
- The **entire strait is on Asia's continental shelf**.

Topic 52. TEJA SINGH SUTANTAR

Important for subject : History

Punjab Chief Minister unveiled a statue of Teja Singh Sutantar, a former MP and revolutionary leader.

Teja Singh Sutantar

- Teja Singh was born as Samund Singh in 1901 in Aluna village of Gurdaspur district.
- After completing his schooling, he **joined Khalsa College in Amritsar.**
- **Following the Jallianwala Bagh massacre in 1919, he joined the Akali Dal** to participate in the movement to liberate gurdwaras from degenerate mahants.
- However, in **September 1921, he formed his own squad called the Sutantar Jatha**, which **successfully liberated a gurdwara in a village called Teja i**n Gurdaspur district from the mahants.
- He later freed another gurdwara in Othian village from mahants. **Early life and revolutionary activities**
- In early 1923, **Teja Singh went to Kabul as a Sikh missionary and there he came into contact with a few leaders of the Ghadar Party**, who were preparing for their second attempt to overthrow the British government.
- They persuaded Teja Singh to undergo military training, so **he joined the Turkish military academy in 1925** under the pseudonym Azad Beg.
- He **later moved to Berlin and then to Canada and the United States**, where he addressed congregations of Indians, mainly Punjabi Sikh immigrants.

Political Career

- After visiting several countries**, Teja Singh returned to India and became a prominent leader of the communist party (CPI).**
- He contributed **revolutionary articles to the party journal, the Kirti, frequently writing about issues that plagued peasants.**
- In May 1937, he was elected unopposed to the Punjab Legislative Assembly as a nominee of the Indian National Congress while he was still in prison.
- He continued to remain a member of the Punjab Legislative Assembly till 1945.
- He was also the **secretary of the Communist Party (Punjab) from 1944 to 1947**.

- **Post Independence political activities**:
- Post-independence, **Teja Singh, who a prominent leader of the Kisan Sabha**, led a number of peasant agitations against the government and landlords.
- He was a **key leader in the PEPSU Muzara movement**, which **started in the 1930s and went on till 1952.**
- The **movement was started by landless peasants (muzaras) in PEPSU (Patiala and East Punjab States Union**, which included the districts of Mansa, Sangrur, Barnala, and parts of Bathinda, apart from Patiala) **to obtain ownership rights of the land** they had been tilling for generations.
- The farmers would finally receive land rights in 1952.
- After independence, **Teja Singh formed his Lal (Red) Party with the Kirti group of the Punjab Communist Party** as its nucleus.
- He would go on to become a member of the Punjab Legislative Council from 1964-1969.
- He **edited Lal Jhanda**, a **monthly magazine in Urdu**, **Lal Savera, a Punjabi weekly** and contributed to various newspapers.
- In 1971, he was **elected to the Lok Sabha**.

Topic 53. AMBEDKAR JAYANTI

Important for subject : History

- **Bhirao Ramji Ambedkar**, popularly known as Babasaheb, was the chairman of Constitution Drafting Committee and a champion of Dalit and minority rights movement in India.
- Ambedkar, who was an economist and social reformer, also served as **the first Law Minister of Independent India.**
- Born into a poor Mahar caste in Mhow, Madhya Pradesh, he was the first untouchable to have entered **Elphinstone College**which was affiliated with University of Bombay.
- After obtaining a degree in economics and political science, Ambedkar moved to United States in 1913 to study at **Columbia University**in New York City. He earned doctorates in economics from Columbia University **and London School of Economics.**
- Throughout his political career and public life, Ambedkar worked for upliftmentof

Dalit (untouchable) community.

- In 1920, Ambedkar launched a newspaper called "**Mooknayaka**" Other periodicals started by him were – '**Bahishkrit Bharat' (1927), 'Samatha' (1929)** and **'Janata' (1930))**
- In 1923, he set up the '**Bahishkrit Hitkarini Sabha**. Ambedkar launched full-fledged movements for **Dalit rights in 1927**and demanded public drinking water sources open to all and right for all castes to enter temples.
- This is called as **Mahad Satyagraha.** Ambedkar participated in **all three round table conferences**in London.
- He demanded separate electorate for untouchables which were opposed by Gandhiji leading to **Poona pact in 1932.**
- The **Poona Pact** was an agreement between Mahatma Gandhi and B. R. Ambedkar on behalf of depressed classes and upper caste Hindu leaders on the reservation of electoral seats for the depressed classes in the legislature of British India in 1932.
- It was signed by Ambedkar on behalf of the depressed classes and by Madan Mohan Malviya on behalf of Hindus and Gandhi as a means to end the fast that Gandhi was undertaking in jail as a protest against the decision made by British prime minister **Ramsay MacDonald** to give **separate electorates**to **depressed classes**for the election of members of provincial legislative assemblies in British India. They finally agreed upon 148 electoral seats. Nearly twice as many seats were reserved for **Depressed Classes** under the **Poona Pact** than what had been offered **by MacDonald's Separate Electorate**.
- He published the book **Annihilation of Caste in 1936**which spoke against caste system and Hindu orthodox religious leaders.
- In order to participate in this election Dr. Ambedkar established **Independent Labour Party** in August, 1936 which contested election on 17 seats in Bombay Presidency and won 15 seats.
- After this on 19thJuly, 1942 he formed another party known as **All India Scheduled Castes Federation (AISCF)**. This party contested election held in 1946 and 1952 but lost them under the adverse impact of Poona Pact.
- As a result of it Dr. Ambedkar himself lost the election in 1952 and 1954 At last Dr. Ambedkar dissolved AISCF on 14th October, 1956 at Nagpur and announced the

formation of **Republican Party of India (RPI)**.

- He was the **chairman** of the **drafting committee** of **Indian constitution**

Topic 54. REPATRIATION OF ANCIENT REMAINS HAS TO BE A NAGA PROCESS

Important for subject :History

- Speaking of repatriating ancestral human remains, taken away as trophies of colonialism, it took the Maoris 12 years.
- In the case of other aboriginal peoples, it has taken decades.
- For the Naga people, the journey is only beginning, in the shape of a project to repatriate Naga ancestral human remains from the **Pitt Rivers Museum, Oxford University.**

RRaD (Recover, Restore and Decolonise)

- RRaD (Recover, Restore and Decolonise) was formed **in 2021 to facilitate and engage with issues around the repatriation of Naga ancestral human remains** to the Naga homeland.
- In 2020, the Pitt Rivers Museum (PRM) in Oxford, UK, reached out to the Forum for Naga Reconciliation (FNR) to help facilitate community dialogue regarding the "future care and return" of Naga ancestral human remains.
- As part of this process, the FNR formed Recover Restore and Decolonise (RRaD) to study and network with indigenous elders, conduct participatory action research, generate public awareness, and develop a strong viable case to make an official claim to the University of Oxford for returning the Naga human remains.

Topic 55. CANADA, JAPAN, UK, EU QUESTION INDIA'S QUALITY CONTROL ORDERS AT WTO

Important for subject: Economy

What is the issue?

- Canada, Japan, the UK and the European Union have raised concerns at the WTO about the increasing number of quality control orders (QCOs) being issued by India across sectors such as toys, tyres, auto parts, chemicals and petrochemical products, many of which seem "protectionist in nature

- Earlier this week, at a meeting of the WTO Committee on Trade in Goods in
- Geneva, the four members noted that some of India's QCOs may not be compliant with WTO norms as they appeared to be tools to protect domestic industry
- **The Department of Policy for Investments and Internal** Trade has issued 20
- QCOs in the last three years for products such as toys, leather and rubber footwear, safety glass and sewing machines.

Topic 56. GOVT. UNVEILS QUALITY CONTROL ORDERS FOR TECHNICAL TEXTILES

Important for subject: Economy

The Ministry of Textiles has announced two **Quality Control Orders (QCOs) for 31 technical textile items** which include 19 geo textile and 12 protective textile products.

- The latest QCO is the first-ever technical regulation for technical textile products in the country.
- In the next phase, the Ministry of Textiles is looking to issue two more QCOs for 28 items that aim to cover 22 agro textile products and six medical textile items.
- Recently Quality Control Orders (QCO) were introduced for fibres such as cotton, polyester and viscose which are the basic raw materials in the Indian textile industry.

Quality Control Orders (QCOs)

- For ensuring the availability of quality products to consumers, **Quality Control**
- **Orders (QCOs) are issued by various Ministries/Departments of the**
- **Government of India** in the exercise of the powers conferred by section **16 of the Bureau of Indian Standards Act**, 2016 stipulating conformity of the products to Indian Standards.
- The **main aim of the QCO is to control the import of sub-quality and cheaper items and to ensure that customers get quality products**.
- QCOs **can only be challenged at WTO** if they are **imposed on grounds of health, safety, environment and deceptive trade practice, or national security**.
- BIS certifies it for International and domestic products.

India's stand:

- All orders are in line with WTO norms
- India has the right to impose QCOs since they are first applied in the domestic market and then on imports.
- India's rationale behind issuing QCOs is to curb the dumping of cheap products from China and to address the widening trade deficit, which is nearly 40% of the total deficit.

Technical Textiles

- **Technical textiles** are functional **fabrics that have applications across various industries** including automobiles, civil engineering and construction, agriculture, healthcare, industrial safety, personal protection etc.
- Technical Textile products derive their demand from development and industrialization in a country.
- Based on usage, **there are 12 technical textile segments**: Agrotech, Meditech, Buildtech, Mobiltech, Clothtech, Oekotech, Geotech, Packtech, Hometech, Protech, Indutech and Sportech.
- For example, 'mobiltech' refers to products in vehicles such as seat belts and airbags, airplane seats; geotech, which is incidentally the fastest growing subsegment, used to hold back soil, etc.

Topic 57. INDIAN HISTORY CONGRESS DENOUNCES CHANGES MADE IN NCERT BOOKS

Important for subject : Governance

The Indian History Congress has said that it is "greatly alarmed by the changes in the history syllabi and textbooks" recently effected by the National Council for Educational Research and Training (NCERT), and urged historians to stand up against "distortions of history".

Distortions

- It pointed out that the University Grants Commission (UGC), in the draft syllabus that it has framed for the Bachelor's course for History, **claims for India the "honour" of being the Aryan homeland, deems the epics as possible historical chronicles and excludes all reference to caste system in its ancient India portion.**
- **Mughal emperor Akbar, along with his policy of religious tolerance** between various religions, has been **excluded from the syllabus.**

In NCERT books

- It claimed that the same process of "misrepresentation has been introduced in the prescribed History textbooks by omitting whole sections, along with individual passages and sentences.
- These include **complete omission of the narrative of the Mughal dynasty** which gave India political unity, and sundry other deletions **inlcduing Mahatma Gandhi's assasination.**

About Indian History Congress:

- Indian History Congress(IHC) was **founded in 1935** IHC is the largest **association of professional historians in South Asia.**
- It has about **35000 members of which over 2000 delegates participate** in its **session every year.**
- It has been holding its sessions very regularly from its inception and publishing its proceedings every year since 1935.

Origin:

- IHC can be traced to the efforts of scholars working on India's ancient past as well as modern history, in a bid to counter the colonial claims, while also drawing from Western analytical methods.
- **Bharata Itihasa Samshodhaka Mandala (BISM)** was one such effort that owed its origins to the stalwart **Vishwanath Kashinath Rajwade**. He founded this institution in 1910 in Pune with the support of K C Mehendale.
- **BISM organised an All India Congress in 1935** to celebrate its silver jubilee. The Indian History Congress (IHC) was thus born with about 50 delegates.

Mandate:

- To regulate the standard of works of history produced in India.
- To promote impartial and substantive history.
- To commit to a fair and scientific history, devoid of bias and politics.
- Historians Ram Sharan Sharma, Satish Chandra, Bipan Chandra, Romila
- Thapar, B. N. Mukherjee, N. Panikkar, Brajadulal Chattopadhayay, Dwijendra
- Narayan Jha, Sumit Sarkar, Sabyasachi Bhattacharya have had a long association with the Indian History Congress.