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Topic 1. BORLAUG AWARD FOR DR SWATI NAYAK

Important for the subject: Science and technology

Dr Swati Nayak, an Indian scientist at the **International Rice Research Institute (IRRI)**, has been named the **2023** recipient of the prestigious **Norman E Borlaug Award for Field Research and Application**, with the **World Food Prize Foundation** describing her as an “**outstanding young scientist.**”

About Norman E Borlaug award:

Given by: World Food Prize Foundation

- The award is given to **exceptional scientists under 40** and someone who works in the field of food and nutrition security, hunger eradication in memory of the **Nobel awardee and Green Revolution’s chief architect Dr Norman Borlaug.**
- **Norman Ernest Borlaug** was an **American agronomist** who led initiatives worldwide that contributed to the extensive increases in agricultural production termed the **Green Revolution.**
- Borlaug was awarded multiple honors for his work, including the **Nobel Peace Prize**, the **Presidential Medal of Freedom** and the **Congressional Gold Medal.** Borlaug was often called “**the father of the Green Revolution**”.

About Dr Swati Nayak and her work:

- **Nayak** is **South Asia head for Seed System** and Product Management at the **International Rice Research Institute (IRRI).**
- Her work has been on “**technology scaling**” or closing the gap between scientific knowledge and its practical application among farmers.
- She is credited with the successful dissemination and adoption of more than 20 climate-resilient and bio-fortified rice varieties.
- Among these are ‘**Sahbhagi Dhan**’, a **drought-tolerant variety** suitable for hilly uplands, and ‘**BINA Dhan-11**’, which is **flood-tolerant.**
- She introduced ‘**Sahbhagi Dhan**’ in the tribal belt of Odisha’s Mayurbhanj district with the help of women farmers. ‘Sahbhagi Dhan’ becomes a much in demand variety throughout Odisha.
- ‘**BINA-Dhan-11**’, which contains a **submergence-tolerant Sub1 gene** identified from an indigenous land race of Odisha, was a similar success.
- **Sub1 gene** has been incorporated into many existing popular **high-yielding varieties** such as ‘**Samba Mahsuri**’, ‘**Swarna**’ and ‘**Ranjit**’.
- There are other **drought-tolerant varieties** such as ‘**DRR Dhan 42**’ and ‘**DRR Dhan 44**’. Nayak is credited with taking all these varieties from lab to land.

Seed varieties:

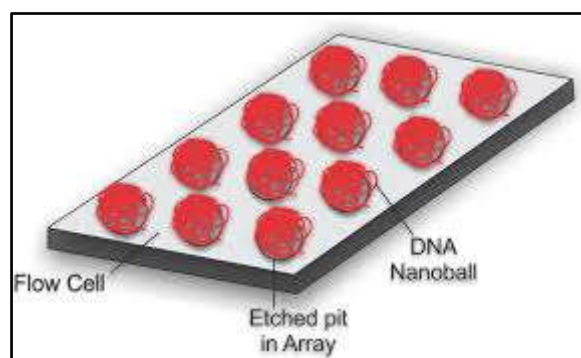
- **Nuclear seed:** This is the **hundred percent genetically pure seed** with physical purity

and produced by the original breeder/Institute /State Agriculture University (SAU) from basic nucleus seed stock. A pedigree certificate is issued by the producing breeder.

- **Breeder seed:** The progeny of nucleus seed multiplied in large area as per indent of Department of Agriculture and Cooperation (DOAC), Ministry of Agriculture, Government of India, under supervision of plant breeder / institute / SAUs and monitored by a committee consisting of the representatives of state seed certification agency, national / state seed corporations, ICAR nominee and concerned breeder.
- This is also hundred percent physical and genetic pure seed for production of foundation seed. A golden yellow colour certificate is issued for this category of seed by the producing breeder.
- **Foundation seed:** The progeny of breeder seed produced by recognized seed producing agencies in public and private sector, under supervision of seed certification agencies in such a way that its quality is maintained according to prescribed field and seed standards. A white colour certificate is issued for foundation seed by seed certification agencies.
- **Registered seed:** Registered seed shall be the progeny of foundation seed that is so handled as to maintain its genetic identity and purity according to standard specified for the particular crop being certified. A purple colour certificate is issued for this category of seed.
- **Certified seed:** The progeny of foundation seed produced by registered seed growers under supervision of seed certification agencies to maintain the seed quality as per minimum seed certification standards. A blue colour certificate is issued by seed certification agency for this category of seed.
- **Labelled Seed:** The seed notified under Section 5 of the Seeds Act, 1966, such seed sold in the market has to be labelled as prescribed under Section 6(a) and (b) of the Seeds Act Such seed is called Labelled Seed.

Topic 2. DNA NANOBALL STRATEGY, A LOW-COST TECHNOLOGY

Important for the subject: Science and technology



With just a **room-temperature “pot,”** a sprinkling of molecules, and a simple **electrical device, pathogen DNA detection** can now be achieved in under an hour anywhere.

DNA nanoball strategy:

- A new platform using **nucleic acids-based diagnostics** showcases a way to **detect**

pathogens more quickly in the field.

- Through **loop-mediated isothermal amplification technology (LAMP)**, the approach creates **nanoballs out of pathogens' DNA** that can then be **identified through electrical signaling**, using the **MEMS (micro electro mechanical systems)**—the technology of microscopic devices incorporating both electronic and moving parts.
- This method creates **concatemers**—long DNA molecules that contain multiple copies of the same DNA sequence linked in series—that fold into themselves to produce **micrometer-sized balls of DNA** from target viral or bacterial nucleic acids.
- These so-called “**DNA nanoballs**” are the **size of certain bacteria and are detectable by a microscope and electrical impedance**.
- The design does not need laboratory techniques to support diagnosis. It is a lowcost technology that can be widely deployed and scalable.

Advantages:

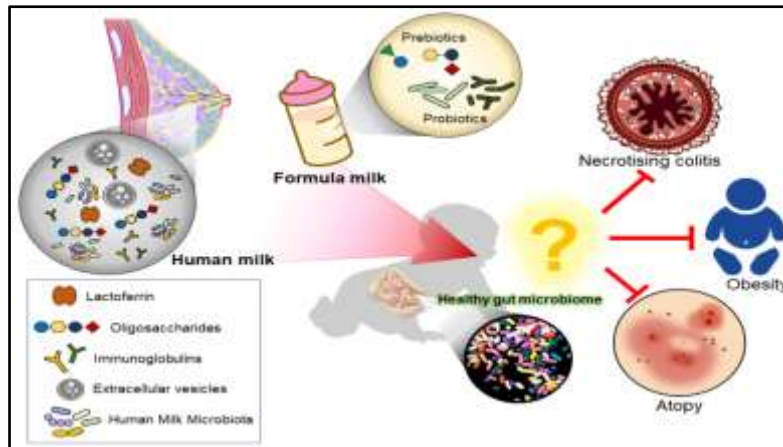
- Detects viruses when infected people are pre-symptomatic. Viruses can be detected when there are less than ten copies in a nasal swab sample.

DNA nanoball sequencing:

- **DNA nanoball sequencing** is a high throughput sequencing technology that is used to determine the **entire genomic sequence of an organism**.
- The method uses rolling circle replication to amplify **small fragments of genomic DNA into DNA nanoballs**.
- **Fluorescent nucleotides** bind to complementary **nucleotides** and are then polymerized to anchor sequences bound to known sequences on the **DNA template**. The base order is determined via the **fluorescence of the bound nucleotides**.
- This **DNA sequencing method** allows large numbers of **DNA nanoballs** to be sequenced per run at lower reagent costs compared to other next generation sequencing platforms. A limitation of this method is that it generates **only short sequences of DNA**, which presents challenges to mapping its reads to a reference genome.

Topic 3. RICHNESS OF HUMAN MILK

Important for the subject :Science and technology



A new finding about the carefully tailored richness of human milk has shed light on the importance of **myo-inositol**, a cyclic sugar alcohol.

Details of the findings:

- The levels of **myo-inositol** are **high over the first two weeks of lactation** and gradually taper off over a period of a few months.
- In the early stages, the **brain of the newborn is a site of rapid ‘wiring’**, as synapses (or connections between nerve cells) are formed in profusion.
- **Proper synapse formation** during early development lays the foundation for **cognitive development**; inadequate synapse formation leads to development difficulties in the brain.

Myo-inositol:

- **Myo-inositol** is a **cyclic sugar-alcohol**, about half as sweet as sugar. It is abundant in the **brain**, where it mediates the response to several hormones.
- Our body needs **inositol to form cell membranes**. Our body makes **myo-inositol from glucose**, mostly in the kidneys.

Sources of Myo-inositol:

- Our body’s requirements go up along with the intake of coffee and sugar, and in conditions such as diabetes. The bran of grains and seeds contains a **precursor of inositol, phytic acid**. Almonds, peas and cantaloupes are also rich sources.
- In animal models of diabetes, adding **myo-inositol** back to the diet of inositoldeprived mice helps prevent **cataract formation** and other complications associated with diabetes.

Other milk constituents:

- Other constituents of human milk have unique nutritive values too. An essential nutrient, an **Omega-3 fatty acid** and **dicosahexaenoic acid (or DHA)**, varies depending on the

food the pregnant mother has been eating.

- The **DHA levels** vary in the **lactating mother's milk across nations** — **2.8%** in mainland China, **1%** in **Japan**, around **0.4-0.2%** in **Europe** and **the U.S.**, and **only 0.1%** or so in several developing countries. **DHA** is important for the developing **brain and retina**.
- **Necrotizing enterocolitis (NEC)** is a severe **gastrointestinal condition** that impacts premature or extremely low birth weight infants.
- **Symptoms include** inadequate feeding, abdominal bloating, multiorgan failure, and can be fatal.
- **Risk factors** consist of **bottle-feeding, prematurity, and low birth weight (1.5 kg or less)**.
- The condition arises from a **combination of compromised blood flow and intestinal infection**. The NEC can be **prevented by the utilisation of breast milk and probiotics**.
- Nearly **10%** of premature babies develop **NEC**, with a quarter of affected infants succumbing to the disease. The intestines of premature babies do not produce enough **IL-22**, which is involved in protecting us from microbial infections.

Topic 4. AS OSIRIS-REX RETURNS TO EARTH FROM ASTEROID BENNU

Important for the subject: Science and technology

NASA's **Origins, Spectral Interpretation, Resource Identification, Security– Regolith Explorer (OSIRIS-REx)** mission returns to Earth carrying an estimated **250 grams (8.8 ounces) of material** gathered from the surface of an asteroid.

The samples contained in the capsule may help distinguish true asteroid-origin materials and terrestrial contaminations or alterations for multiple meteorite types.

OSIRIS-REx mission:

- **OSIRIS-REx** launched from **Cape Canaveral, Florida** in **2016** and spent two years traveling to **Bennu**, a **carbon-rich asteroid** that orbits between **Earth and Mars**.
- The spacecraft arrived at the asteroid in **December 2018** and orbited for **two years**, measuring the **asteroid's mass, density, albedo, surface composition** and **particle environment**.
- The **landing site on Bennu** was named: **Nightingale**.

Findings:

- During its reconnaissance of **Bennu**, the mission team discovered that the **asteroid is of the rare active variety**, meaning that it intermittently ejects material from its surface.
- The surface is far more rugged than expected, hosting several hundred boulders larger than ten meters in diameter. **Bennu's bulk density is lower than expected**; as much as **60%** of the asteroid might be empty space.
- The surface was covered with **hydrated minerals** that suggest past **aqueous activity**, and **Bennu's rotation is speeding up**, likely caused by an interaction with solar radiation

known as the **YORP effect** (YarkovskyO'Keefe-Radzievskii-Paddack).

Why return samples?

- Material has been collected and returned to Earth from **comets, asteroids, the solar wind and the Moon**.
- Samples returned **directly from a source** can answer many scientific questions that can't be answered by remote observations, landers and rovers, or even meteorites fallen to Earth.
- Many details hidden within a rock can be lost during a meteorite's atmospheric entry and impact but are preserved with a returned sample.
- Earlier samples returned from **asteroids Itokawa and Ryugu** had been analyzed, which were the targets of past missions of the **Japan Aerospace Exploration Agency (JAXA)**.
- The **Hayabusa spacecraft** collected evidence of space weathering on **Itokawa**, and **Hayabusa2** found that **Ryugu is made of carbon-rich rocks**, known as **carbonaceous chondrites**, that closely trace the Sun's composition. The **Ryugu samples** revealed that the **few meteorites of the same classification that have fallen to Earth were chemically altered by the journey**.

Planning for the future:

- This will be **NASA's first sample return mission** since **Stardust in 2006** and **Genesis in 2004**.
- **Japan's Hayabusa and Hayabusa2 missions** returned samples in **2010** and **2020**, respectively, and **China's Chang'e 5 mission** brought **lunar samples back in 2020**.
- The **OSIRIS-REx science team** will **retain 25% of the material**. The **Canadian Space Agency** will **receive 4%** for its contribution to the spacecraft's instrumentation, and **JAXA** will receive **0.5%** in exchange for samples from both Hayabusa missions.

Topic 5. DRAFT PATENT AMENDMENT RULES UNDERMINE PRE-GRANT OPPOSITION

Important for the subject: Science and technology

Introduction

Current **pre-grant opposition provisions** in the **Patents Act** allow anyone to file objections against patent grants before they are finalized. Proposed changes in **draft patent amendment rules, 2023** aim to **alter the process and criteria for pre-grant opposition**.

Proposed Changes and Concerns

- Draft rules introduce **variable fees for opposition**. Grant **controller** gains the **power to decide opposition maintainability**. **Weakened safeguards** against **patent evergreening**, and **higher drug prices**. **Lack of clear guidelines for maintainability decisions**.
- Proposed fees pose **financial challenges** for smaller groups.

Champions Against Evergreening

- **Nandita Venkatesh (India), Phumeza Tisile (South Africa)** thwarted **Johnson & Johnson's Bedaquiline patent extension**.
- Both individuals, **TB survivors themselves**, filed the **pre-grant opposition** along with the **Network of Maharashtra people living with HIV (NMP+)**, with support from **Médecins Sans Frontières**.

Unique Provision and Its Importance

- Pre-grant opposition is **distinct in the Indian Patent Act**.
- **Section 25(1) of the Indian Patent Act** allows any person to file a pre-grant opposition against a patent application before it is granted.
- Prevents **unjust** patent protection extensions. Vital for **affordable generic drug access**.

Failed Evergreening Attempts Stopped by Opposition

- Patents for **Tenofovir disoproxil fumarate (TDF)**, Boehringer Ingelheim's pediatric form of the anti-AIDS drug **Nevirapine**, **Glivec (imatinib mesylate)**, **Zidovudine/Lamivudine (first-line HIV medicines)**, and **Lopinavir/Ritonavir (second-line HIV medicines)**.

Indian Patents Act, 1970

- Primary legislation governing **patents in India**.
- **Novelty and Non-Obviousness:** Patents require new and non-obvious ideas.
- **Industrial Application:** Inventions must be usable in industry.
- **Exclusions:** Some inventions, like those related to **atomic energy**, are not patentable.
- **Term of Patent:** Patents last for 20 years from the filing date.
- **Opposition:** Third parties can oppose a patent within a set time frame.
- **Compulsory Licensing:** Under specific conditions, third parties can use a patented invention.

Key Terms:

- **Patent:** A patent is a **government-issued exclusive right** that provides inventors or assignees with the **sole authority to utilize, make, sell, or license their invention for a limited period**. This exclusivity is granted in return for disclosing the details of the invention to the public.
- **Patent Evergreening:** The practice of making minor changes to an existing patented drug to extend its patent protection.

Evergreening

- **Evergreening** is the practice of companies filing for an extension of a patent with minor process or product modifications just before the original patent expires at the end of 20

years.

- Patents offer their owners market exclusivity for a limited period of time—For medicines, this exclusivity should last as long as the **primary patent** — which relates to the active pharmaceutical ingredient (API) of the medicine is in effect, typically 20 years.
- The end of patent exclusivity will reduce the drug prices drastically. The threat of this steep fall in profits urges pharmaceutical companies to find new ways to postpone their exclusivity.
- Companies use a process known as secondary patenting or evergreening to keep generic companies out of the market.
- Secondary patenting or evergreening is achieved by seeking extra patents on modifications of the original drug: new forms of release, new dosages, new combinations or new forms.

Indian Patent Act and evergreening:

- The basic principle of the Patent Law in our country is that a **patent is granted only for an invention which must be new and useful.**
- **Section 3(d) of India’s patent law** forbids patenting of incremental innovations—or evergreening.
- Section 3(d) of The Patents Act, 1970 –“the mere discovery of a new form of a known substance or the discovery of any new property or new use for a known substance or of the use of a known process, machine or apparatus unless such known process results in a new product or employs at least one new reactant is not patentable”.
- This clause was also **upheld by the Supreme Court in 2013** when it turned down Swiss drugmaker Novartis’ plea for patenting its cancer drug Glivec.
- **Section 3(d) necessitates** a demonstration of improvement in its therapeutic efficacy. The provision also bars patents for new uses and new properties of known substances.
- In the case of Novartis, Glivec was just a new form of a known substance, imatinib, and therefore the patent for Glivec was rejected under section 3(d) of the Patents Act.
- **Section 2(1) (ja)** -the product in question must feature a technical advance over what came before that’s not obvious to a skilled person.
- **Section 3(e)** ensures that patents for combinations of known substances are allowed only if there is synergistic effect.
- **Section 3(i)** ensures that no exclusivity can be claimed over methods of treatment.

Topic 6. ORIGIN OF CARBON DIOXIDE ON EUROPA’S SURFACE FOUND

Important for the subject: Science and technology

Europa, one of **Jupiter’s** largest moons, is characterized by its **icy surface**. Beneath this icy crust, a **subsurface ocean exists**. **Carbon dioxide** on Europa’s surface has posed a mystery, prompting investigations into its source.

Source of Carbon Dioxide

- Researchers used data from the **James Webb Space Telescope** to determine the origin of carbon dioxide on Europa.
- **Recent discoveries** strongly indicate that **the carbon dioxide found on Europa's surface originates from its subsurface ocean.**
- Understanding the presence of carbon dioxide in this context is pivotal for evaluating **Europa's habitability.**

Challenges in Identifying the Source

Previous observations left scientists with multiple hypotheses:

- **Direct emanation from the subsurface ocean** Delivery via **meteorite impacts**, or Generation on the surface through **interactions with Jupiter's magnetosphere.**

Evidence Supporting Subsurface Origin in Tara Regio

- **Two independent studies** utilized **near-infrared spectroscopy** to examine Europa's surface carbon dioxide.
- **Dr. Samantha Trumbo** and her team meticulously mapped carbon dioxide distribution, discovering **concentrated hotspots** in the **Tara Regio region**, known for geological disturbances.
- Another study, led by **Dr. Geronimo Villanueva**, found **mixed carbon dioxide compounds on the surface and inconclusive isotopic ratios.**
- Despite hints of **volatile plumes** in previous studies, the James Webb Space Telescope's observations **did not detect such activity.**

NIRS (Near-Infrared Spectroscopy):

Analytical technique.

1. Operates in **near-infrared spectrum (700-2500 nm). Non-destructive.**
2. Studies **molecular composition.**
3. Identifies and quantifies components.
4. Used to analyze **Europa's surface CO₂.**

Topic 7. DEFENCE PROCUREMENT BOARD DISCUSSES NAVY'S PROPOSAL FOR A SECOND VIKRANT LIKE AIRCRAFT CARRIER

Important for the subject :Science and technology

The **Defence Procurement Board (DPB)** discussed the **Indian Navy's proposal for acquiring a second Vikrant-like aircraft carrier displacing 45,000 tonnes**, and estimated a cost of around **₹40,000 crore**, according to defense sources.

The project is estimated to cost around **₹40,000 crore** and will see some modifications and upgrades to the design of the **country's first Indigenous Aircraft Carrier (IAC) INS Vikrant**, commissioned in September 2022, and will also be manufactured by **Cochin**

Shipyard Limited (CSL).

- IAC-2 (which is under consideration) will have a displacement of **65,000 tonnes** and a **Catapult Assisted Take Off But Arrested Recovery (CATOBAR)** system for launching aircraft as well as **full-electric propulsion**.

INS Vikrant:

- The **262m long and 62m wide INS Vikrant** displacing **44,800 tonnes** is powered by **four General Electric LM2500 engines** which give it a **maximum speed of 28 knots** and an **endurance of 7,500 Nautical Miles**.
- The ship uses an aircraft-operation mode known as **Short Take Off But Arrested Recovery (STOBAR)** for which it is equipped with a **ski-jump for launching aircraft**, and a set of three **‘arrestor wires’** for their recovery onboard.
- The Navy also operates the **44,500-tonne carrier INS Vikramaditya**, which also employs the **STOBAR mechanism**, procured from **Russia** in November 2013.

Defense Acquisition Council (DAC):

- The **DAC** is the **highest decision-making body** in the **Defence Ministry** for deciding on new policies and capital acquisitions for the three services (Army, Navy and Air Force) and the Indian Coast Guard.
- The **Minister of Defence** is the **Chairman** of the Council.
- It was formed, after the **Group of Ministers** recommendations on **‘Reforming the National Security System’**, in **2001**, post **Kargil War (1999)**.

Hierarchy:

- **Services Procurement Board (SPB)** chaired by **Chief of Integrated Defence Staff (CISC)** for cases upto **Rs. 300 crore**, **Defence Procurement Board (DPB)** chaired by **Defence Secretary** for cases having value **more than Rs. 300 crore and upto Rs. 500 crore** and **Defence Acquisition Council (DAC)** chaired by **Raksha Mantri** for cases **beyond Rs. 500 crore**.

Topic 8. GALACTIC TIDES: PUSHING AND PULLING THE HEAVENS

Important for the subject :Science and technology

What are Galactic tides? Like the **earth’s oceans** at their shores, the **universe’s galaxies** also **experience tides**, but on a much larger scale.

Galactic tides are caused by **gravitational forces within a galaxy**, arising in the **interactions** between **celestial objects** like **stars and gas clouds**.

- These **tidal forces** influence various aspects of a galaxy’s evolution. They can **reshape a galaxy structure** by creating **tidal tails and bridges**, **promoting star formation**, and **disrupting smaller star systems**.

- Over eons, **galactic tides** also disrupt the orbits of stars, leading to **long-term changes in galactic structure**. **Galactic tides** also have a say in the ways in which **proximate galaxies do and don't interact**.
- Research shows that **Andromeda's (galaxy nearest to our Milky way) tidal streams** near its edges could be **signatures of dwarf galaxies** that were later devoured. The **Andromeda galaxy is heading towards the Milky Way at 110 km/s** and will collide in four billion years.
- **Galactic tides** also affect the **supermassive black holes** at galaxy centres, leading to events that change the ways in which these cosmic beasts interact with nearby stars. **Tidal tails formed by the galactic tides**

Topic 9. THE FUKUSHIMA N-WASTEWATER CONTROVERSY

Important for the subject :Science and technology

On **April 13, 2021, Japan** announced plans to release over **one million tonnes of contaminated water** from the **Fukushima nuclear plant** into the sea over the **next 30 years**.

This wastewater is a result of the **2011 earthquake and tsunami** that disabled the **Fukushima Daiichi nuclear power plant**, releasing **radioactive materials**. The decision has sparked global opposition over **health risks**, particularly in **seafood-dependent regions**.

Treatment Process

- **Tokyo Electric Power Company (TEPCO)** is responsible for treating the water. The treatment process involves multiple techniques, with the most notable being the **Advanced Liquid Processing System (ALPS)**.
- **ALPS** is designed to **remove 62 types of radioactive materials**, leaving the water significantly cleaner.
- However, the ALPS process **does not effectively remove tritium**, a **radioactive isotope of hydrogen**.

Safety Concerns

- **Tritium Risk:** Tritium, primarily in the form of **tritiated water**, is readily absorbed by living organisms and rapidly distributed throughout their bodies via the **bloodstream**.
- This includes potential developmental effects in **babies** when pregnant women ingest it, as **it can cross the placenta**.
- **Bioaccumulation:** Tritium can bioaccumulate in **aquatic life** and terrestrial plants, potentially affecting entire food chains.
- **Ionizing Radiation:** Tritium emits **low-energy beta radiation**, which, when ingested or inhaled, can expose internal tissues to radiation, increasing **cancer risk**.
- **Genetic Damage:** Prolonged exposure to tritium may cause **genetic mutations and cell damage**.
- **Long Half-life:** Tritium has a **half-life of about 12.3 years**, which means it remains

radioactive for an extended period, potentially impacting ecosystems over time. (As tritium decays, it changes to **helium**)

Difference between tritiated water and water with Tritiate:

Aspect

Tritiated Water

Water with Tritiate

- **Composition** All hydrogen atoms are replaced by tritium atoms in water molecules. A mixture of tritium and regular hydrogen atoms in water molecules

Chemical Formula

1. **T O or H O** (where T = tritium)
2. Variable composition with H and T in water molecules
3. **Radioactivity Highly radioactive** due to pure tritium content
4. **Less radioactive** compared to tritiated water **Common Usage**
5. Commonly used in **scientific research and industrial applications**
6. Less common and typically associated with **nuclear processes**

Topic 10. GENOMIC CLUES SUGGEST HUMANS' ANCESTORS NEARLY WENT EXTINCT 9L YEARS AGO

Important for the subject: Science and technology

In November 2022, the **global human population** surpassed **eight billion**, highlighting our **dominant presence on Earth**.

Our dominance is attributed to **cognitive abilities, technology, and environmental reshaping**, but it has led to **habitat destruction, pollution, and climate change, endangering species**.

Human Evolution and Genomic Insights

- **Genomic data and fossils** provide profound insights into **human evolution**. **Ancient DNA** has **preservation limitations**, offering **recent insights**.
- **Computational tools** analyze genome sequences, **mitochondrial DNA**, and the **Y chromosome**, extending understanding **across time scales**.
- These tools **identify population bottlenecks, founder events, and genetic disease origins**.

Population Bottlenecks, Founder Effects, and Genetic Diversity Population Bottlenecks:

- Occur when a **population is sharply reduced in size**, often due to **catastrophic events or environmental changes**.
- The **genetic diversity** of the population **significantly decreases**, as only a small number

of individuals survive and reproduce. Bottlenecks reduce numbers, **leading to founder effects**.

Founder Effects:

- **Genetic phenomena** occur when a **small group of individuals**, or founders, **establishes a new population** in a different geographical area or under isolated conditions.
- These **founders carry only a subset of the genetic diversity** present in the larger source population.
- The new population **inherits a limited range of genetic traits**, often resulting in **increased frequencies of specific traits or genetic diseases among their descendants**.

Examples of Founder Populations:

- A small group of individuals gave rise to the modern **Ashkenazi Jewish** population, leading to a **higher prevalence of certain genetic diseases** in this group.
- Similarly, **Indian endogamous groups**, formed through strict marriage practices, have shared genomic stretches due to **inbreeding**, resulting in specific genetic traits being more common within these populations.

Near-Extinction Event in Human History

- Recent **computational research** challenges prior **human origin estimates**. Around **1,200 founding ancestors** are proposed, contrasting earlier estimates of 100,000.
- The bottleneck occurred **about 900,000 years ago**, lasting over 100,000 years.
- This bottleneck **coincided with significant climate changes**, potentially affecting species survival.
- Recovery may be linked to **improved conditions, fire use, and agriculture**. The **prolonged small breeding population** likely influenced **human genetic diversity and evolutionary outcomes**.

Topic 11. INDIANS CONTINUE TO EAT MORE SALT THAN WHO RECOMMENDATION

Important for the subject :Science and tech

The **estimated mean daily salt** intake in **India** stands at **8.0 g** (8.9 g/day for men and 7.1 g/day for women) against the **World Health Organisation (WHO) recommendation of up to 5 g daily**.

The study is based on a sample survey carried out as part of **National NCD Monitoring Survey (NNMS)** in **India**.

- The salt intake was significantly **higher in men**, those in **rural areas** and **overweight and obese respondents**.
- The perception of the harmful effects of high salt intake and practices to limit intake was low in the study population.

- Salt intake was **higher** in employed people (**8.6 gm**) and **current tobacco users (8.3 gm)** and those with **high blood pressure (8.5 gm)**.

Recommendation:

- Reducing the intake is a beneficial and **cost-saving way** to reduce elevated **blood pressure** by **25%** and advocates a **30%** reduction in mean population salt intake by **2025**.

Cardiovascular disease:

- **Cardiovascular diseases** account for an estimated **28.1 %** of total deaths in India.
- In **2016, 1.63 million deaths** were attributable to **hypertension** compared to **0.78 million deaths** in **1990**.
- **Cardiovascular diseases (CVDs)** are a **group of disorders of the heart and blood vessels**.

They include:

- **coronary heart disease** – a disease of the blood vessels supplying the heart muscle;
- **cerebrovascular disease** – a disease of the blood vessels supplying the brain;
- **peripheral arterial disease** – a disease of blood vessels supplying the arms and legs;
- **rheumatic heart disease** – damage to the heart muscle and heart valves from rheumatic fever, caused by streptococcal bacteria;
- **congenital heart disease** – birth defects that affect the normal development and functioning of the heart caused by malformations of the heart structure from birth; and **deep vein thrombosis and pulmonary embolism** – blood clots in the leg veins, which can dislodge and move to the heart and lungs.

Topic 12. ASSESSMENT OF SPACE SITUATION DONE TO ENSURE SAFETY OF ADITYA L1

Important for the subject :Science and Technology

While the **Indian Space Research Organisation’s (ISRO) Aditya-L1 spacecraft** is on its way towards the **Sun-Earth Lagrange’s Point 1 (L1)**, the space agency has done an **assessment of the space situation** around **L1** to ensure safety of the spacecraft.

Space situation Assessment (SSA):

- SSA deals with the comprehensive knowledge of the space environment, assessment of any threats to space activities and the implementation of necessary mitigation measures to safeguard the space assets. SSA plays a crucial role in ensuring safe and sustainable space activities complying with domestic and international guidelines, standards and other norms.

Aditya L1 mission:

- **Aditya-L1** is **India’s first mission** dedicated to studying the Sun. The spacecraft

commenced its journey **L1**, on September 18 and is expected to reach L1 by January 2024.

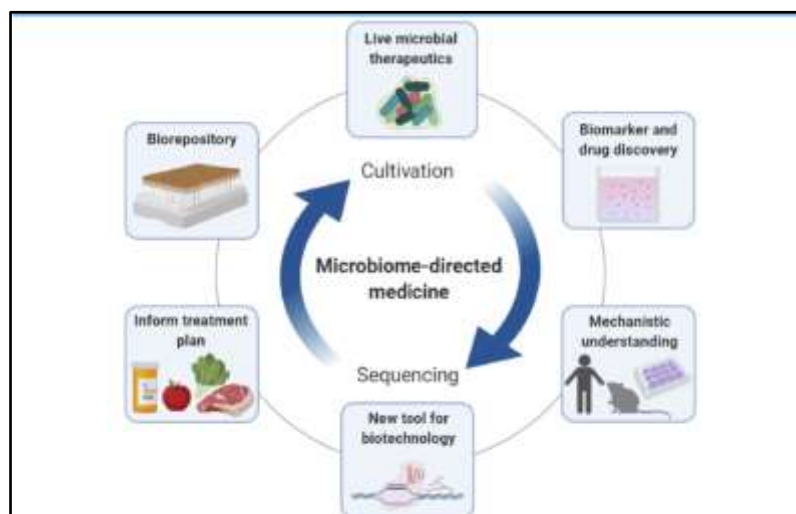
- **Aditya-L1** will operate in a **halo orbit around the Sun-Earth L1 point**, located approximately **1.5 million kilometers** from Earth.
- **Halo orbits** are **periodic, three-dimensional orbits** around a **Lagrange Point** (L1, L2 or L3) and involve an **out-of-plane motion component** relative to the primary bodies. The orbit is large enough in size to be continuously viewed from Earth and would appear to form a halo around the Lagrange Points (here L1 for Aditya L1).
- **There are currently four operational spacecraft at L1-** WIND, Solar and Heliospheric Observatory (SOHO), Advanced Composition Explorer (ACE) and Deep Space Climate Observatory (DISCOVER).
- These spacecraft at L1 provide **vital early warnings on adverse space weather events** that help protect orbiting space assets and ground-based infrastructure.

Science Objectives of Aditya L1 mission:

- Study of Solar upper atmospheric (chromosphere and corona) dynamics. Study of chromospheric and coronal heating, physics of the partially ionized plasma, initiation of the coronal mass ejections, and flares
- Observe the in-situ particle and plasma environment providing data for the study of particle dynamics from the Sun. Physics of solar corona and its heating mechanism.
- Diagnostics of the coronal and coronal loops plasma: Temperature, velocity and density. Development, dynamics and origin of CMEs.
- Identify the sequence of processes that occur at multiple layers (chromosphere, base and extended corona) which eventually leads to solar eruptive events.
- Magnetic field topology and magnetic field measurements in the solar corona. Drivers for space weather (origin, composition and dynamics of solar wind).

Topic 13. TACKLING THE VARIOUS MYTHS WITHIN THE FIELD OF MICROBIOME RESEARCH

Important for the subject :Science and Technology



According to an assessment published in Nature Microbiology, it is a myth that the microbes in our bodies outnumber our own cells 10 to one.

Details of the assessment study:

- Done by researchers from **Israel** and **Canada**. A **70 kg “reference man”** to have **38 trillion bacterial cells** and **30 trillion human cells**.

The following are some claims that the assessment checked:

- Scientists had described and speculated on the benefits of bacteria inhabiting the gut, such as **Escherichia coli** and **Bifidobacteria**, as early as the late **19th** and early **20th** centuries itself.
- **Joshua Lederberg**, a **Nobel laureate in medicine**, was credited with the naming of the field in **2001**. According to a **June 2017** paper, **Whipps J.M., Lewis K., and Cooke R.C.** had used the term in **1988** to describe a community of microbes.
- The absolute microbial cells in one gram of human faeces have been **exaggerated 10-to-100 fold**. According to the authors, the actual number is around **10¹⁰ to 10¹²**. It weighed about 200 grams.
- **Mothers don’t pass their microbiomes to their children at birth**. Some microorganisms are directly transferred during birth but they constitute a small fraction of the human microbiota.
- A microbe and its metabolite can be ‘good’ or ‘bad’. Diseases have been correlated with changes in the composition of the microbiome.
- While different bacteria in the human microbiome perform some common important functions, many functions are the preserve of a few species.
- Sequencing of microbes is biased from collecting samples to storing them, even in the choice of software to analyse sequence data.

What are microbiomes?

- The **microbiome** is the community of microorganisms (such as fungi, bacteria and viruses) that exists in a particular environment. In humans, the term is often used to describe the microorganisms that live in or on a particular part of the body, such as the skin or gastrointestinal tract.

Topic 14. WHAT IS GEOSPATIAL INTELLIGENCE? A GEOGRAPHER EXPLAINS THE POWERFUL MELDING OF MAPS AND DATA

Important for the subject: Science and Technology

Geospatial intelligence has offered valuable insights to help governments and organizations protect communities from extreme weather events.

Geospatial intelligence:

- It is the collection and integration of data from a network of technologies, including

satellites, mobile sensors, ground-control stations and aerial images.

- The data is used to produce **real-time maps and simulations to help identify when, where and to what extent a threat is likely to emerge.**
- Government officials, individuals or both can use this information to make informed decisions.
- **Geospatial intelligence (GEOINT)** is intelligence about the human activity on earth derived from the exploitation and analysis of imagery, signals, or signatures with geospatial information. The geospatial intelligence industry is projected to grow from a US\$61 billion enterprise in 2020 to more than \$209 billion in 2030.

Applications of Geospatial Intelligence:

- It contributes to emergency preparedness and response. The **National Hurricane Center** actively monitors the location, formation and trajectory of **tropical cyclones**.
- Detailed information on the timing, location and strength of a given hurricane helps officials distribute resources and personnel, as well as issue storm warnings and evacuation orders.
- **Geospatial intelligence** also provides valuable guidance for search-and-rescue and recovery efforts following a disaster.
- They helps first responders **locate access points** in the transportation network to rescue survivors, **set up aid stations** and **provide emergency supplies**. It is also used for **environmental monitoring**.
- **Monitoring temperature, precipitation, snowpack and polar ice** helps scientists and government officials anticipate and prepare for potential disturbances.

Military and civilian logistics:

- It has also made contributions in the Russian-Ukraine war. A commercial satellite imagery reported the 40-mile-long convoy of Russian ground forces heading toward Kyiv in February 2022.
- It is also used in transportation, logistics and global supply chains. **GPS** provides **governments, businesses and people** with detailed information on the time, location and destination of ships and cargo. This leads to greater efficiency and more consistent and reliable operations.
- **Geospatial intelligence** is also helping with the **rollout of autonomous vehicles**. The city planners and engineers are able to detect markings and features on the ground such as bicycle lanes and traffic direction. It helps planners build safer, smarter, more efficient and better-connected communities.
- It also helps in the **development, implementation and evaluation of digital twins**. **Digital twins are virtual representations of real systems** that mimic the systems' characteristics and can be updated in real time to reflect changing conditions in the systems. **They are useful in:** decision making, modeling changes and predicting outcomes, simulating weather and terrain to evolve a strategy.

Topic 15. HOW CAN A QUANTUM COMPUTER PROVE THAT IT IS SUPERIOR?

Important for the subject :Science and Technology

Quantum Computing (QC):

QC technology promises more speed and more efficient problem-solving abilities, challenging the boundaries set by classical, conventional computing. **Quantum supremacy** is the term used for these computing techniques as **QCs have the ability to solve some problems much faster than a classical computer.**

Facing the quantum challenge:

- **Quantum computers** use **quantum bits, or qubits**, whereas classical computers use binary bits (0 and 1).
- **Qubits are fundamentally different from classical bits** as they can have the value 0 or 1, as a classical bit can, or a value that's a combination of 0 and 1, called a **superposition**.
- **Superposition states allow qubits to carry more information.** This capacity of quantum computers allows them to perform a disproportionately greater number of operations.
- **Qubits also exhibit entanglement**, meaning that **two qubits can be intrinsically linked regardless of their physical separation.** This property allows quantum computers to tackle complex problems that may be out of reach of classical devices.

Scalability- Biggest advantage of QCs:

- In classical computers, the processing power grows linearly with the number of bits. While in QCs it grows **exponentially as 2^n** , where **n is the number of qubits.**

P-hard problems:

- **Quantum circuits** (core of QCs) consist of **qubits** and **quantum gates**. In such a circuit, a quantum gate could manipulate the qubits to perform specific functions, leading to an output.
- **Classical computers** struggle with **#P-hard problems** – a set of problems that includes **estimating the probability** that random quantum circuits will yield a certain output.
- **P-hard problems** are a subset of **#P problems**, which are all counting problems.
- If a problem is **P-hard**, then it is so challenging that if you can efficiently solve it, you can also efficiently solve every other problem in the #P class by making certain types of transformations.

Taking the Cayley path:

- **Cayley path** is a mathematical construct developed by **Dr. Movassagh** to prove that certain classes of problems can be solved by quantum computers but not by classical computers.

Quantum complexity theory:

- **Dr. Mossavagh's** paper shows that there exists a problem that presents a computational barrier to classical computers but not to quantum computers (assuming a **quantum computer can crack a #P-hard problem**).
- The theory also challenges the extended **Church-Turing thesis**, which is the idea that classical computers can efficiently simulate any physical process.
- The **establishment of quantum supremacy** will have a positive impact in the field of **cryptography**.

Quantum computers:

Quantum Technology

- Quantum Technology is based on the principles of Quantum mechanics that was developed in the early 20th century to describe nature at the scale of atoms and elementary particles.
- The first phase of this revolutionary technology has provided the foundations of our understanding of the physical world, including the interaction of light and matter, and led to ubiquitous inventions such as lasers and semiconductor transistors.
- A second revolution is currently underway with the goal of putting properties of quantum mechanics in the realms of computing.

Properties of Quantum Computing

- **Superposition** – It is the ability of a quantum system to be in multiple states simultaneously.
- **Entanglement**– It means the two members of a pair (Qubits) exist in a single quantum state. Changing the state of one of the qubits will instantaneously change the state of the other one in a predictable way. This happens even if they are separated by very long distances. Einstein called spooky 'action at a distance'.
- **Interference** – Quantum interference states that elementary particles (Qubits) can not only be in more than one place at any given time (through superposition), but that an individual particle, such as a photon (light particles) can cross its own trajectory and interfere with the direction of its path.

How does a computer use quantum superposition?

- The **bit** is the **fundamental unit** of a **classical computer**.
- Its value is **1** if a corresponding transistor is on and **0** if the transistor is off. The transistor can be in one of two states at a time – on or off – so a bit can have one of two values at a time, 0 or 1.
- In the **Qubits**, instead of being either 1 or 0, the **information is encoded in a superposition**: say, **45% 0 plus 55% 1**.
- This is entirely unlike the two separate states of 0 and 1 and is the **third kind of state**.

One qubit can encode **two states**. **Five qubits** can encode **32 states**. A computer with **N qubits** can encode **2^N states** – whereas a computer with **N transistors** can **only encode $2 \times N$ states**.

- So a qubit-based computer **can access more states than a transistor-based computer**, and thus access more computational pathways and solutions to more complex problems. It's typically a particle like an **electron**.

What are Transmons:

- In **quantum computing**, and more specifically in **superconducting quantum computing**, a **transmon** is a type of **superconducting charge qubit** that was designed to have reduced sensitivity to charge noise.
- **Google** and **IBM** have been known to use **transmons**, where **pairs of bound electrons oscillate between two superconductors** to designate the two states.

Potential Applications For Quantum Computing

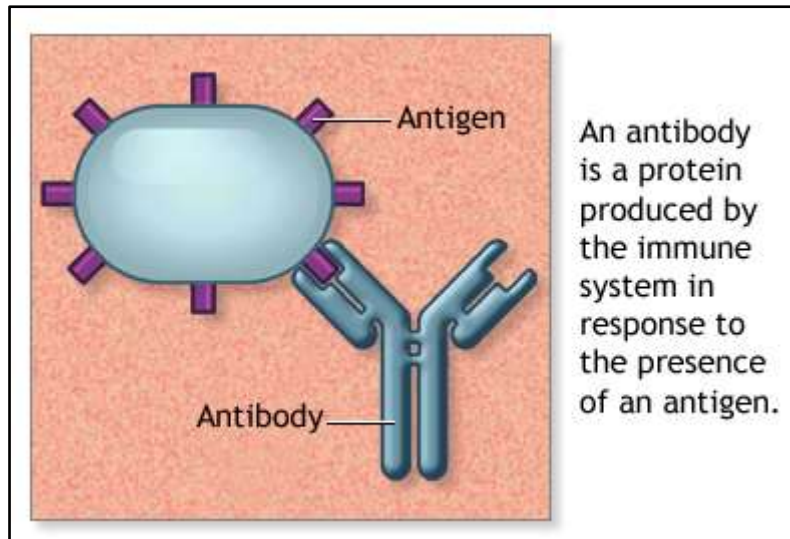
1. Machine Learning
2. Computational Chemistry
3. Financial Portfolio Optimisation
4. Secure Communication
5. Disaster Management
6. Pharmaceutical
7. Logistics and Scheduling
8. Cyber Security
9. Augmenting Industrial revolution 4.0

National Mission on Quantum Technology and Applications (NMQTA)

- Union Budget 2020-21 proposed to spend Rs 8,000 crore on the newly launched NMQTA.
- In 2018, the Department of Science & Technology unveiled a programme called Quantum-Enabled Science & Technology (QuEST) and committed to investing Rs. 80 crore over the next three years to accelerate research.
- The mission seeks to develop quantum computing linked technologies amidst the second quantum revolution and make India the world's third-biggest nation in the sector after the US and China.

Topic 16. NIPAH VIRUS OUTBREAK: WHAT ARE MONOCLONAL ANTIBODIES?

Important for the subject : Science and Technology



India reached out to Australia to procure **monoclonal antibody doses to combat the Nipah virus** outbreak in Kerala.

What is a monoclonal antibody?

- **Niels K. Jerne, Georges J.F. Köhler and César Milstein** were awarded the **medicine Nobel Prize in 1984** for their work on “**the principle for production of monoclonal antibodies**”.
- **Monoclonal antibodies** are **laboratory-made proteins** that mimic the behavior of antibodies produced by the immune system to **protect against diseases and foreign substances**.
- An **antibody** attaches itself to an **antigen** – a foreign substance, usually a disease-causing molecule – and helps the immune system eliminate it from the body.

Monoclonal antibodies are specifically designed to target certain antigens.

What is m102.4?

- **m102.4** is a “**potent, fully human**” **monoclonal antibody** that neutralizes **Hendra** and **Nipah viruses**, both outside and inside of living organisms.
- **Glycoproteins** are one of the major components of viruses that cause diseases in humans. The **m102.4 monoclonal antibody** binds itself to the **immunodominant receptor-binding glycoprotein** of the **Nipah virus**, potentially neutralizing it.
- **m102.4** is developed by **Dr. Christopher Broder** and his team at the **Uniformed Services University of the Health Sciences (USU)** in **Bethesda, Maryland**, with help from the **U.S. National Institutes of Health (NIH)**.
- Currently, the drug is used on a ‘**compassionate use**’ basis– a treatment option that allows the use of an unauthorized medicine under strict conditions among people where

no other alternative and/or satisfactory authorized treatment is known to be possible and where patients cannot enter clinical trials for various reasons.

How do monoclonal antibodies work?

- They are meant to **attach themselves to the specific disease-causing antigen**. An antigen is most likely to be a protein.
- **Hybridoma** is a **fusion cell** made up of **B cells** (white blood cells that produce antibodies) and **myeloma cells** (abnormal plasma cells). These **hybrid cells** allowed the researchers to produce a single antibody clone, which came to be known as a **monoclonal antibody**.
- These antibodies are made using **recombinant DNA technology**. The **gene** that codes for the **monoclonal antibody's binding region** — also known as the **variable region** — is isolated from a **B cell** or synthesised in the laboratory.
- This antibody is then introduced into a host cell, often a bacterium or a mammalian cell, using **recombinant DNA technology**. The host cells, called **bioreactors**, **produce large quantities of the monoclonal antibodies** which are extracted, purified, and readied for use as desired.

Hendra and Nipah virus:

- Both **Hendra** and **Nipah viruses** are **bat-borne Paramyxoviridae** – a family of viruses that **contain a single-strand RNA of negative-sense genome**, similar to the ones that cause diseases like **measles, influenza etc.**, and **replicate within infected cells**.
- Both **Hendra virus** and **Nipah virus** are on the **World Health Organisation's list of priority diseases** requiring urgent attention for research and development of therapeutics.

Topic 17. INSIDE THE DIGITAL WORLD OF COOKIES

Important for the subject : Science and Technology

What are cookies?

cookies are **small blocks of data created by a web server while a user is browsing a website** and placed on the **user's computer or other device by the user's web browser**.

Cookies are placed on the device used to access a website, and more than one cookie may be placed on a user's device during a session.

Cookies help in personalisation and user convenience.

- The **term cookie** was coined by **web-browser programmer Lou Montulli**. It was derived from the term **magic cookie**, which is a packet of data a program receives and sends back unchanged, used by Unix programmers.

How do cookies work?

- Cookies remember one's login information on websites i.e. one do not have to repeatedly enter one's credentials every time one revisit a site, making it convenient for use.

- Cookies remember the previous interactions on a website, so that next time one visits that website, it personalises the user experience. For example: e-commerce websites show the similar products you had previously searched for on their website.
- Platforms like **Facebook** and **Google** use cookies to track online behaviour, ensuring the ads you encounter align with your preferences.

Disadvantage: Privacy concerns and the potential for data misuse.

What are the types of cookies?

- **Session cookies:** They are temporary cookies and stored in your computer's memory only during your browsing session.
- **Persistent cookies:** They stay on your device after your browsing session ends. Persistent cookies **remember your login information, language preferences, and even the ads you have interacted with.**
- **Secure cookies** are **only sent over encrypted connections**, making them safer from prying eyes. Secure cookies are often used for sensitive data like login credentials.
- **Third-party cookies:** They come from **a domain other than the one you are visiting.** They are often used for **tracking and advertising purposes**, which can be both **useful and, at times, intrusive.**

What are the uses of cookies?

- They act as **digital ID cards**, aiding in user authentication by allowing websites to recognise and keep you logged in during your visit. They foster a sense of personalisation.
- They function as the digital equivalent of a persistent shopping cart, ensuring that items you have added online remain there when you return.
- Facilitate website owners in **gathering analytics data about user interactions**, enabling them to **make enhancements and customize content.**
- **Targeted advertising:** used to display ads that align with your interests and browsing history.

What are the challenges associated?

- **Privacy concerns:** cookies could track your online behavior. **Security risks:** when cookies are **inadequately secured**, one can face cybercrimes and theft of personal data.
- **Third-party cookies:** may be harmful to the computer device, or can steal the private information from the device.
- Large amounts of data generated by these cookies can slow down the computer or the website.

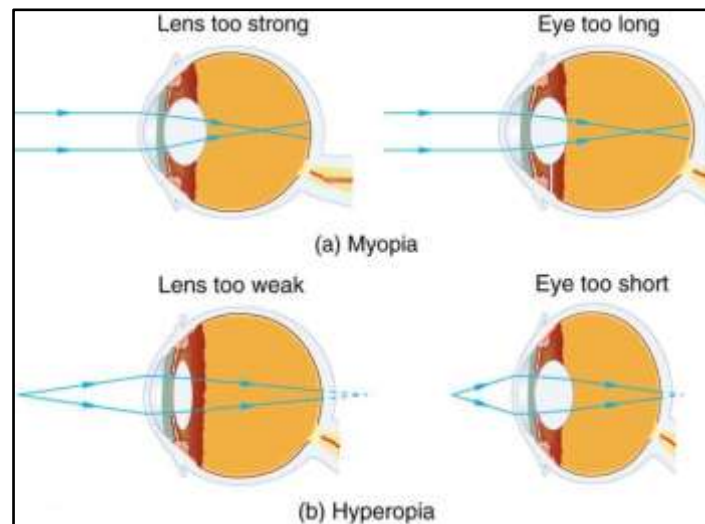
Steps taken:

- **General Data Protection Regulation** and **The California Consumer Privacy Act** necessitates the websites to seek your approval before deploying certain cookie types, resulting in those somewhat irksome pop-ups and prompts.

- India's newly enacted **Digital Personal Data Protection Act 2023** now necessitates websites to **acquire explicit consent from users prior to collecting or processing their personal data via cookies**. The updated law highlights the significance of transparent and well-informed consent.

Topic 18. AT LEAST 100 MILLION IN INDIA NEED SPECTACLES BUT HAVE NO ACCESS

Important for the subject : Science and Technology



The **World Health Assembly**, in its meeting, resolved to implement an “**integrated people-centered eye care**” project.

Global status of people with vision impairment:

- According to the **WHO**, at least **2.2 billion people** function with compromised eyesight and at least **a billion of these were preventable** with access to eye care.
- Around 90%** of those with **vision impairment or blindness** live in **low- and middle-income countries**. Fourth **international conference on ‘Eye health in a changing world’** organised by the **India Vision Institute**, a non-governmental organisation.

The common defects of the eyes are:

Myopia, Hypermetropia, Presbyopia

- These are called the **refractive defects** because they are caused by incorrect refraction of light rays by the eye lens.

Myopia

- It is also called **shortsightedness**

In Myopia:

- Person is able to see nearby objects clearly but is not able to see faraway object.

2. Image of Faraway objects is formed in front of retina. Far point of person is nearer than infinity.

Causes of Myopia

1. Excessive curvature of eye lens (eye lens become more curved)
2. Eyeball becomes elongated

Correction of Myopia

1. It is corrected by using **concave lens** of suitable power
2. It helps to form image on the retina

Hypermetropia

- It is called **long sightedness** (or **Hyperopia**)

In Hypermetropia

1. Person is able to see faraway objects but are not able to see nearby objects
2. Image of Nearby objects is formed behind the retina
3. Near point of person is beyond 25 cm

Causes of Hypermetropia

1. Eyeball becomes too small
2. Focal Length of Eye lens is too long

Correction of Hypermetropia

1. It is corrected by using **convex lens** of suitable power
2. It helps to form image on the retina

Presbyopia

1. It is the defect in which person is not able to see nearby objects clearly
2. It is formed in old persons whose **ciliary muscles** become weak with age Hence, they lose their power of accommodation.

Causes

1. Weakening of Eye muscles
2. Decrease in Flexibility of Eye lens

Correction of Presbyopia

- it is also corrected with the help of **convex lens** (just like Hypermetropia)

In both Presbyopia and Hypermetropia:

- A person cannot see nearby objects clearly but can see far away objects clearly.

The difference is in their causes:

- **Presbyopia** is caused due to **loss of Power of Accommodation** **Hypermetropia** is caused due to **abnormal shape of the eyeball or abnormal shape of the eye lens**

What are Bifocal Lens?

- It is a lens whose upper part consists of concave lens and inside part for convex lens
- It is used in case of those patients who are suffering from both myopia and hypermetropia

Progressive lens:

- **Progressive lenses** are a type of lens which have **no differentiating lines between the focal distances**. These have **three different levels of focal distances ranging from distance to near**.
- One looks through the top portion of the lens to see far-away objects, the middle to focus on intermediate objects and the bottom to see things close-up.
- This may be especially useful to **people who wear single-vision eyeglasses for distance (due to Myopia)** in addition to **reading glasses for near work (due to presbyopia)**.

Topic 19. SHOULD GENERATIVE ARTIFICIAL INTELLIGENCE BE REGULATED?

Important for the subject : Science and Technology

What is the legal framework on which generative AI rests, and who owns content?

The U.S. Copyright Office’s guidance on generative AI only recognises copyright for works created by people.

While in **India** (presently there is no law or regulations specifically for generative AI), the copyright of authorship of a work was jointly given to a person and generative AI. After controversy the withdrawal notice was issued to the human co-author.

European Union’s Artificial Intelligence (AI) Act:

- The Act’s central approach is the **classification of AI tech based on the level of risk they pose** to the “**health and safety or fundamental rights**” of a person.
- There are four risk categories in the Act— unacceptable, high, limited and minimal. There is a provision for ‘**conformity assessments**’ — algorithmic impact assessments to analyze data sets fed to AI tools, biases, how users interact with the system, and the overall design and monitoring of system outputs.

Important provisions related to generative AI:

- If something is generated through generative AI tools, then it needs to be tagged as

material generated by an AI tool.

- One should provide at least a short summary of the training material used, which is important from a copyright perspective.

Where does global AI governance currently stand?

- The U.S. does not currently have comprehensive AI regulation. A Blueprint for an **AI Bill of Rights (AIBoR)** has been released by the US government.
- China has come out with some of the **world's first nationally binding regulations targeting specific types of algorithms and AI.**
- It enacted a law to regulate recommendation algorithms with a focus on how they disseminate information.
- **China's Cyberspace Administration of China (CAC)**, which drafted the rules, told companies to **"promote positive energy"**, to not **"endanger national security or the social public interest"** and to **"give an explanation"** when they harm the legitimate interests of users.

Topic 20. HIGH-SPEED RAIL (HSR)

Important for the subject: Science and Technology



China launched its first high-speed rail line that will travel across several bays and skim along the coast of the southeastern province of Fujian near the Taiwan Strait, state media reported on Thursday.

It is China's first cross-sea, rapid line with bullet trains that will travel over bridges across three coastal bays and hit top speeds of 350 km per hour (218 mph), state media said, citing China State Railway Group Co Ltd, the country's railway operator.

What is high-speed rail (HSR)

- A high-speed rail (HSR) is a type of passenger train service that operates at significantly

higher speeds than traditional rail systems. The defining characteristic of HSR is its ability to consistently reach speeds well above those of conventional trains.

- While there is no universally agreed-upon speed threshold that categorizes a rail service as “high speed,” HSR typically involves trains that can travel at speeds of 155 mph (250 km/h) or more.

Key features and characteristics of high-speed rail systems include:

High Operating Speeds: HSR trains are designed to operate at much higher speeds than regular trains, allowing for faster travel between cities and regions.

- **Dedicated Tracks:** HSR often uses dedicated tracks that are separate from existing rail lines and are specially designed to accommodate high speeds. This minimizes interference from slower freight trains or other traffic.
- **Advanced Technology:** HSR trains incorporate cutting-edge technology in areas like aerodynamics, propulsion, and braking systems to maximize efficiency and safety.
- **Electric Power:** Most HSR systems are electrically powered, often using overhead catenary wires or a third rail, which reduces emissions and allows for rapid acceleration and deceleration. **Streamlined Design:** High-speed trains typically have streamlined, aerodynamic shapes to reduce air resistance and improve fuel efficiency.
- **High Capacity:** HSR trains are designed to carry large numbers of passengers, making them a competitive alternative to air travel for certain routes.
- **Reduced Travel Times:** The primary goal of HSR is to reduce travel times between major cities and regions, making it an attractive option for commuters and long-distance travelers. **Safety Measures:** HSR systems incorporate advanced safety features and signaling systems to ensure passenger safety at high speeds.
- High-speed rail networks are most commonly found in countries like **Japan, France, Germany, China, and Spain**, where they have become integral parts of the transportation infrastructure. These systems offer a fast, efficient, and environmentally friendly mode of transportation.

High speed rail in India

- At present, Mumbai-Ahmedabad High Speed Rail Corridor is the only sanctioned High Speed Rail Project, which is under execution with technical and financial assistance from Govt. of Japan.
- Further, Ministry of Railways has decided to undertake Detailed Project Report (DPR) for the following six High Speed Rail (HSR) corridors:
 1. Delhi -Varanasi
 2. Delhi – Ahmedabad
 3. Mumbai– Nagpur
 4. Mumbai – Hyderabad
 5. Chennai – Mysore
 6. Delhi –Amritsar.

Topic 21. VARIOUS PATHOGENS INCREASINGLY BECOMING RESISTANT TO CRITICALLY IMPORTANT ANTIMICROBIALS: ICMR REPORT

Important for the subject: Science and Technology

The Antimicrobial Resistance Research and Surveillance Network of the Indian Council of Medical Research (ICMR) released its **annual report for 2022**.

This is the **sixth report** which sheds light on the evolving landscape of antimicrobial resistance (AMR) in the country. A trend of declining susceptibility towards **critically important antimicrobials (CIA)**.

- **CIA**s and **Highest Priority Critically Important Antimicrobials (HPCIA)** are the categories of antimicrobial agents identified by the **World Health Organization (WHO)** based on their importance in human medicine and the urgency to preserve their effectiveness.
- **Erythromycin**, an antibiotic from the class of macrolides and ketolides, is classified as an **HPCIA**.
- **Escherichia coli** was identified as the most commonly occurring pathogen, followed by **Klebsiella pneumoniae, Pseudomonas aeruginosa, Acinetobacter baumannii** and **Staphylococcus aureus**.

Pathogens

Key findings

Escherichia coli

- **Escherichia coli** is a Gram-negative, facultative anaerobic, rod-shaped, coliform bacteria of the genus Escherichia that is **commonly found in the lower intestine of warmblooded organisms**.
- It is identified as the most commonly occurring pathogen whose susceptibility has increased to several CIAs..
- Decline in susceptibility of E coli to fluoroquinolones, cephalosporins, penicillins and carbapenems.

baumannii

- **Acinetobacter baumannii** is a typically short, almost round, rod-shaped (coccobacillus) Gram-negative bacterium.
- It can be an opportunistic pathogen in humans, **affecting people with compromised immune systems**, and is becoming increasingly important as a **hospital-derived (nosocomial) infection**.
- A **baumannii** was identified as the most common isolate in ICU.

pneumoniae

- **Klebsiella pneumoniae** is a Gram-negative, non-motile, encapsulated, lactose-fermenting, facultative anaerobic, rod-shaped bacterium.
- Found in the normal flora of the mouth, skin, and intestines Exhibited low susceptibility percentages to many CIAs.

aeruginosa

- **Pseudomonas aeruginosa** is a common encapsulated, Gram-negative, aerobic–facultatively anaerobic, rod-shaped bacterium that can cause disease in plants and animals, including humans.
- A species of considerable **medical importance**, **P. aeruginosa is a multidrug resistant pathogen** recognized for its ubiquity, its intrinsically advanced antibiotic resistance mechanisms, and its association with serious illnesses – hospital-acquired infections such as ventilator-associated pneumonia and various sepsis syndromes.

S aureus

- **Staphylococcus aureus** is a Gram-positive spherically shaped bacterium, a member of the Bacillota, and is a usual member of the microbiota of the body, frequently **found in the upper respiratory tract and on the skin**.
- It is becoming increasingly challenging due to the emergence of **multi-drug resistant strains** including **Methicillin-Resistant S aureus (MRSA)**.

Salmonella typhi

- **Salmonella enterica typhi** is a gram-negative bacterium that is responsible for typhoid fever. It exhibited a resistance rate of more than 95 per cent against the fluoroquinolones.

Misuse of antibiotics:

- A 2021 report by Delhi-based think tank, **Centre for Science and Environment**, highlighted the misuse of several antibiotics from these classes in food producing animals in India.
- It identified **27 different types of CIAs from seven classes**, including **macrolides** and **ketolides**, third generation **cephalosporins** and **fluoroquinolones**, which were found to be used in dairy, poultry and aquaculture for both therapeutic and non-therapeutic purposes.

Topic 22. PEACE CLAUSE AT WTO

Important for the subject :International Relations

Developing nations, including India, will make a strong pitch for a permanent solution to their concerns on subsidy limits placed on their public stockholding programmes at the WTO Senior Officials’ meeting scheduled next month, sources have said.

- The meeting has been called by the WTO Secretariat, on October 23-24, to work out the agenda for WTO's 13th Ministerial Conference in February 2024.
- The Africa Group and the G33 alliance of developing nations, of which India is a part, have all been pushing for a permanent solution on public stockholdings underlining the importance of food security especially in the light of the sufferings during the Covid-19 pandemic.
- The G33 (or the Friends of Special Products in agriculture) is a coalition of developing and least developed countries. Despite the name, there are currently 48 member nations including China, Cuba, India, Indonesia, Nigeria, Pakistan etc.
- It was established prior to the 2003 Cancun ministerial conference, that have coordinated during the Doha Round of World Trade Organization negotiations, specifically in regard to agriculture.
- Dominated by India, The group has “defensive” concerns regarding agriculture in relation to World Trade Organization negotiations, and seeks to limit the degree of market opening required of developing countries.
- Facing repeated attacks from certain developed nations at the WTO which allege that India's MSP programmes affect food security of other nations, India argued at a meeting on agriculture earlier this year that its public stockholding of food grain actually helped provide food security.
- During Covid-19 disruptions, these stocks helped India feed (provide free foodgrains) to its 800 million plus vulnerable population, it said.
- WTO members have been specifically targetting India's MSP programme for rice as its subsidies have breached the subsidy ceiling of 10 per cent for agriculture produce forcing the country to use the **Bali 'peace clause'**.

Peace Clause

- It was agreed to at the WTO's Bali Ministerial meeting in December 2013 that allowed developing countries to breach subsidy limits on food crops Important for the subject to certain conditions being met related to notifications on the PSH programmes and food security.
- The peace clause allows developing countries to breach the subsidy ceiling without being dragged into dispute by members, for rice. However, it comes with tough notification requirements and conditions, all of which are difficult to follow.

Notification conditionalities mentioned in the Bali peace clause

- A separate notification on all PSH programmes involves giving details of all MSP operations and numbers related to procurement, storage and disbursement not only for rice but other items covered under the programmes, including wheat and pulses.

First country to invoke the peace clause

- India had earlier invoked the clause for 2018-19, when it became the first country to do so.
- India informed the WTO that the value of its rice production in 2019-20 was \$46.07

billion while it gave subsidies worth \$6.31 billion, or 13.7 percent as against the permitted 10 per cent.

- India said that under its public stockholding programmes for food security purposes, rice, wheat, coarse cereals and pulses, among others, are acquired and released in order to meet the domestic food security needs of the country's poor and vulnerable population, and "not to impede commercial trade or food security of others.
- For these reasons only the breach of the de minimis limits for rice is covered by the peace clause. Government does not undertake exports on a commercial basis from public stockholdings. Additionally, open market sales of food grains from public stockholding are made provided the buyer gives an undertaking of not exporting from such purchase.
- The 'peace clause' said that no country would be legally barred from food security programmes even if the subsidy breached the limits specified in the WTO agreement on agriculture.
- It protects India's food procurement programmes against action from WTO members in case the subsidy ceilings – 10 percent of the value of food production in the case of India and other developing countries – are breached.
- **The Agreement on Agriculture (AoA)** is a WTO treaty that was negotiated during the Uruguay Round of the General Agreement on Tariffs and Trade (GATT) and formally ratified in 1994 at Marrakesh, Morocco.
- The AoA came into effect in 1995. According to its provisions, developing countries were to complete their reduction commitments by 2000 and developed countries by 2004.
- The Least Developed Countries were not required to make any reductions. The Agreement covers products that are normally considered part of agriculture but excludes forestry and fishery products and also rubber, sisal, jute, coir and abaca.

The provisions of the WTO Agreement on Agriculture relate mainly to three broad categories-

Market Access

- Tariffication – implies all non-tariff barriers to be abolished and converted to tariffs.
- Tariff reduction – Developing countries were obligated to reduce tariffs by 24% in 10 years.
- Access opportunities – Minimum access equal to 3% of domestic consumption in 1986-88 will have to be established for the year 1995 rising to 5% at the end of the implementation period.

2. Export subsidies

- Developed countries are mandated to reduce their export subsidy volume by 21% and expenditure by 36% in 6 years, in equal installment (from 1986 –1990 levels).
- Developing countries need to reduce export subsidy volume by 14% and expenditure by 24% over ten years in equal installments.

3. Domestic support

- It calls for reduction in domestic subsidies that distorts free trade and fair price.
- Aggregate Measurement of Support (AMS) is to be reduced by 20% over a period of 6 years by developed countries and 13% over a period of 10 years by developing countries.
- **The Agreement on Agriculture (AoA) divides domestic support into 1. Trade distorting** – all trade distorting subsidies are placed under **Amber box** which is qualified in accordance with Aggregate Measure of Support (both product and non product specific).
- These include measures to support prices, or subsidies directly related to production quantities.
- AoA stipulates reduction of total AMS by 20% for developed countries over a period of 6 years while by 13% over a period of 10 years by developing countries.
- **Policies amount to domestic support under this category of less than 5% of value of production for developed countries and less than 10% for developing countries are excluded from any reduction commitments also called de minimis subsidies.**

2. Non trade distorting or minimal trade distorting –

- **Green box** includes assistance given through environmental assistance programmes like research training and extension, marketing information, rural infrastructure etc. Support under it is excluded from any reduction commitments and is not Important for the subject to any upper limit.
- They have to be government-funded (not by charging consumers higher prices) and must not involve price support.
- They tend to be programmes that are not targeted at particular products, and include direct income support for farmers that are not related to current production levels or prices.
- They also include environmental protection and regional development programmes.
- **Blue box** This is the “amber box with conditions”- designed to reduce distortion and includes direct payments in the form of price deficiency, direct payment to limit production. It is also exempted from reduction commitments but has an upper limit.
- **Special and Differential box** includes measures taken by developing countries, otherwise Important for the subject to reduction like investment subsidies, input subsidies.
- The ‘peace clause’ said that no country would be legally barred from food security programmes even if the subsidy breached the limits specified in the WTO agreement on agriculture.
- It protects India’s food procurement programmes against action from WTO members in case the subsidy ceilings – 10 percent of the value of food production in the case of India and other developing countries – are breached.

Topic 23. UNGA SESSION

Important for the subject: International Relations

External Affairs Minister S Jaishankar began a **nine-day visit to the US**, primarily to attend the **annual session of the UN General Assembly** in New York.

The theme of the 78th session of UNGA is “**Rebuilding trust and reigniting global solidarity: Accelerating action on the 2030 Agenda and its Sustainable Development Goals towards peace, prosperity, progress and the sustainability for all.**”

- The events were started on **5th September till 23rd September 2023**. The **first day** of the high-level General Debate **took place on 19th September 2023**.
- **Dennis Francis** is the **President of the 78th Session** of the UN General Assembly,

Some facts about United Nations General Assembly (UNGA):

- It was **established in 1945** under the **Charter of the United Nations** and is headquartered in New York City.
- It is **one of the six principal organs** of the UN and serves as the **main policymaking organ of the Organization**.
- It provides a **unique forum** for multilateral discussion of the full spectrum of international issues covered by the Charter of the United Nations. Each of the **193 Member States** of the United Nations has an equal vote.

What is President of the General Assembly (PGA):

- Any Member State can put forward a candidate for PGA. He/she is **not required** to be, but always has been, a citizen of the Member State presenting the candidacy.
- The PGA is **elected in his/her personal capacity for a one-year term**. The Member State of the PGA **cannot at the same time hold the office of Vice President or Chair of a Main Committee**. Thus, the **five permanent members of the Security Council**, who are always Vice-Presidents, **cannot hold the office of the PGA**.
- The Presidency of the General Assembly rotates among the five regional groups, namely:
- **Group of Asian States, Group of Eastern European States, Group of Latin American and Caribbean States, Group of African States,**

Western European and other States Group.

- The President is **elected by a simple majority** vote of the General Assembly.
- The President is elected at **least three months before formally assuming office**, usually in mid-June.

What is the role and mandate of the President of the General Assembly (PGA):

- The PGA is the **guardian of the General Assembly Rules of Procedure** but has **no say in the actual decision-making** of the General Assembly; in fact, the **PGA does not have**

a vote in the General Assembly.

- Even on procedural matters, the **PGA always remains under the authority of the General Assembly.**
- Hence, PGA has **very little formal power.** It depends on the moral authority and convening power of the office as main instruments to keep the 193 Member States working together.

Topic 24. UKRAINE FIRES MISSILES AT RUSSIA BLACK SEA NAVY HEADQUARTERS IN CRIMEA

Important for the subject : International Relations

Ukraine struck the headquarters of Russia's Black Sea Fleet in a missile attack. Ukraine fires a missile attack that struck the headquarters of Moscow's Black Sea fleet in annexed Crimea.

The strike on the symbolic heart of Russia's Black Sea fleet marks a major blow for Moscow, which has suffered a string of attacks on the strategically important port in recent months

What is Black Sea Fleet:

- The Black Sea Fleet has a **long history** and is considered to have been **founded back in 1783.**
- It comprises **warships of the Russian Navy** in the **Black Sea, Sea of Azov, and the eastern Mediterranean,** and is **headquartered at Sevastopol,** the major port on the Crimean peninsula.

Some facts about Sevastopol:

- Sevastopol is the **largest city in Crimea** and a **major port on the Black Sea.** Due to its strategic location and the navigability of the city's harbors, Sevastopol has been an important port and naval base throughout its history.

Some facts about Crimean Peninsula:

- The Crimean peninsula is **connected on the northwest to the mainland by the "Perekop Isthmus",** a 5-mile- (8-km-) wide strip of land that has been the site of numerous battles for the control of Crimea.
- Between Crimea and the mainland to the north lies **Svyash ("Putrid Sea"),** a network of shallow inlets that is separated from the Sea of Azov by the **Arabat Spit, a 70-mile- (113-km-) long sandbar** along the eastern shore of Crimea.
- The Crimean Peninsula was **annexed by the Russian Federation in 2014** and since then has been administered as **two Russian federal Important for the subjects – the Republic of Crimea and the federal city of Sevastopol.**

Topic 25. CHINA TARGETS ATHLETES FROM ARUNACHAL

Important for the subject: International Relations

China Targets athletes from Arunachal. On the eve of the **19th Asian Games'** opening ceremony, Union Sports Minister Anurag Thakur canceled his planned trip to China.

- The decision was prompted by a troubling incident involving **three athletes, all practitioners of wushu martial arts, hailing from Arunachal Pradesh.**
- These athletes were **denied accreditation cards**, essential for participating in the Games, and were **instead offered stapled visas** by the Chinese authorities.
- It is important to note that these accreditation cards serve a dual purpose, functioning both as **identification cards for the Asian Games and as visas for entry into the host country.**

What is a stapled visa:

- A stapled visa is simply an unstamped piece of paper that is attached by a pin or staples to a page of the passport and can be torn off or detached at will.
- This is different from a regular visa that is affixed to the passport by the issuing authority and stamped.

History of Stapled visas issued by China

- China has a longstanding practice of issuing **stapled visas to Indian nationals hailing from two specific regions: Arunachal Pradesh and Jammu and Kashmir.**
- Despite China's assertion that these stapled visas are valid travel documents, the Government of India consistently rejects this position.
- China initiated the **issuance of stapled visas to residents of Arunachal Pradesh in the mid-2000s** and extended this practice to **residents of Jammu and Kashmir starting in 2009.** Notably, China claims the region of Arunachal Pradesh as part of its own territory, a claim that is contested by India.
- The Indian government firmly **refuses to recognize stapled visas as legitimate travel documents for its citizens.**

Some facts about Asian Games:

- The Asian Games, also known as **Asiad**, are a multi-sport event that takes place every four years. The games are the **second largest multi-sport** event after the Olympics.
- The Olympic Council of Asia (OCA) organizes the games, which have **45 participating countries or regions.** The **Asian Games were first held in 1951**, soon after the end of World War II. The **1st Games were held in New Delhi**, with **11 participating countries, including Japan.**
- The **19th edition** of the Asian Games is being held in **Hangzhou, China** from September 23 to October 8. The **18th Asian Games** were held in **Indonesia.**

Topic 26. XINJIANG PROVINCE

Important for the subject : International Relations

A prominent Uyghur scholar specializing in the study of her people's folklore and traditions has been sentenced to life in prison

Who are Uyghur:

- The Uyghurs are a predominantly **Muslim minority Turkic ethnic group**, whose origins can be traced to Central and East Asia.
- Their native region is considered to be the **Xinjiang Uyghur Autonomous Region** in the People's Republic of China.
- The Uyghurs are considered to be one of the **55 officially recognized ethnic minority communities in China**.
- However, China **recognises the community only as a regional minority** and rejects that they are an indigenous group.

Where is Xinjiang:

- Xinjiang is technically an **autonomous region within China. It is officially known as the Xinjiang Uyghur Autonomous Region (XUAR)**.
- It shares borders with **eight countries, including Kazakhstan, Kyrgyzstan, and Tajikistan to the northwest, Pakistan and India to the southwest, Mongolia to the northeast, Russia to the north, and Afghanistan to the west**.
- It is the largest region and is rich in minerals, oil and natural gas.

Topic 27. INDIA PLANS G20 REGULATORS' DIALOGUE IN NOVEMBER TO STREAMLINE STANDARDS

Important for the subject : International Relations

India plans G20 regulators' dialogue in November to streamline various standards.

India is planning to hold a regulators' dialogue at the closing online G20 Summit proposed in November 2023.

- G20 nations, plus 9 invitees nations, to come and discuss on a mutual basis how Mutual Recognition Agreements (MRAs) can be done, and how we can stream-line standards rather than have every country repeat the same tests which end up impeding trade.
- There are already some existing international standards, such as the Codex for food items and the well defined maximum residue limit (MRL)s, on which countries could try and have some kind of understanding.

For exports it comes as a barrier and bottleneck as costs go up.

- G20 economies rank among the main notifiers of SPS measures, accounting for 65 per cent of total regular notifications (including revisions and addenda) and 35 percent of

emergency notifications (including revisions).

- **Revise, addenda, corrigendum** are technical terms to refer to various modifications to existing standards or guidelines. WTO provides a system for member countries to communicate the various standards that the traded products should meet.
- **ePing** is the system for WTO members to submit notifications to the **WTO Central Registry of Notifications (CRN)**.
- The term “**Codex Alimentarius**” is Latin and means “food code”. The term “food standards” is used in its generic sense and includes all categories of Codex texts, i.e. standards, recommended codes of practice and guidelines.
- The Agreement on the Application of Sanitary and Phytosanitary Measures (the “SPS Agreement”) **SPS Agreement** concerns the application of food safety and animal and plant health regulations.

Topic 28. SAUDI ARABIA, ARAB LEAGUE, AND EU LAUNCH MIDEAST PEACE DAY EFFORT

Important for the subject : International Relations

The initiative aims to create a “**Peace Supporting Package**” that will yield benefits for **both Palestinians and Israelis** upon reaching a peace agreement.

- This package includes **detailed programs and contributions contingent** on achieving a **final status agreement**, motivating sincere efforts toward peace.
- It is **built upon the Arab Peace Initiative and the 2013 EU peace support offer**, seeking to elaborate on their benefits and garner international support.
- The initiative **emphasizes preserving the Two-State Solution** based on the **1967 borders**, respecting international law and **UN Security Council Resolutions**, and **maintaining the Status Quo of Jerusalem’s Holy Sites**.
- **Working groups were established** to outline the components of the “**Peace Supporting Package**.” “These groups **focus on political and security cooperation, economic and environmental cooperation, and the human dimension of peace**.”
- The progress will be assessed **every three months**, with the goal of having the “**Peace Supporting Package**” ready for presentation by **September 2024**.

Topic 29. BIDEN TO HOST LEADER OF PACIFIC ISLANDS , FORUM FOR INDIA-PACIFIC ISLANDS COOPERATION (FIPIC)

Important for the subject : International Relations

Biden to host leader of Pacific Islands to counter China Influence; President Joe Biden is set to host leaders of Pacific Islands in two-day **U.S.-Pacific Island Forum Summit**

- President Joe Biden is set to establish diplomatic relations Monday with two South Pacific nations, **the Cook Islands and Niue**.
- The forum includes **Australia, the Cook Islands, Micronesia, Fiji, French Polynesia, Kiribati, Nauru, New Caledonia, New Zealand, Niue, Palau, Papua New Guinea,**

Republic of Marshall Islands, Samoa, Solomon Islands, Tonga, Tuvalu, and Vanuatu.

What are Pacific Island Countries:

- The Pacific Island Countries are a **cluster of 14 states** which are located largely in the tropical zone of the Pacific Ocean between Asia, Australia and the Americas.
- They include **Cook Islands, Fiji, Kiribati, Republic of Marshall Islands, Federated States of Micronesia (FSM), Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.**
- The islands are **divided on the basis of physical and human geography** into three distinct parts — **Micronesia, Melanesia and Polynesia.**
- Despite their small land area, the islands are spread out over a wide swath of the Pacific Ocean. **Kiribati and FSM, have EEZs larger than that of India.**

What is Forum for India-Pacific Islands Cooperation (FIPIC)

- FIPIC is a **multinational grouping** developed for cooperation between **India and 14 PICs, namely Cook Islands, Fiji, Kiribati, Marshall Islands, Micronesia,**
- **Nauru, Niue, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.**
- It was **launched in November 2014** and the **first FIPIC summit was held in Suva, Fiji** in 2014 and the **second one was held in Jaipur, India in 2015.**
- The 3rd Forum for India–Pacific Islands Cooperation (FIPIC) Summit was **held in Port Moresby, Papua New Guinea** on May 22, 2023.
- It was **co-chaired by Indian and Papua New Guinea’s Prime Minister** and attended by 14 Pacific Island Countries (PICs).

Topic 30. INDIA AND UN LAUNCH GLOBAL CAPACITY BUILDING INITIATIVE

Important for the subject : International Relations

India and the UN have jointly launched an initiative aimed at building the capacity of countries in the Global South.

- India and the United Nations have launched a **collaborative project** to assist countries in the Global South. It **focuses on sharing India’s development experiences and expertise through capacity-building programs.**
- The initiative was **introduced at the India-UN for the Global South event in New York.**
- This initiative **complements the India-UN Development Partnership Fund**, which has supported **75 development projects in 61 countries** over the past six years.
- **UN India and the Bill and Melinda Gates Foundation** will **collaborate** to utilize **India’s Technical and Economic Cooperation platform**, strengthening the initiative’s impact.

- The initiative will **implement development-related goals from India’s G20 Presidency, including advancing progress on Sustainable Development Goals, technological transformation, and building Digital Public Infrastructure.**

What is Global South:

- The Global South is a term often used to **identify the regions of Latin America, Asia, Africa, and Oceania.**
- The term **“Global South” was first coined** by a social activist **Carl Oglesby in 1969.**
- It is an **analogous term to “Third World” and “Periphery” that denote regions outside Europe and North America,** mostly low-income and **often politically or culturally marginalized countries.**
- Countries of the Global South have been described as **newly industrialized or in the process of industrializing,** and are frequently **current or former Important for the subjects of colonialism.**
- As such, the **term does not refer to geographical south;** for example, **most of the Global South is geographically within the Northern Hemisphere.**

Topic 31. MASS MARCH IN SPAIN AGAINST AMNESTY FOR CATALAN SEPARATISTS

Important for the subject: International Relations

Tens of thousands of Spaniards protested in Madrid against possible plans by acting Prime Minister Pedro Sanchez to grant an amnesty to Catalan separatists.

- Withdrawing criminal cases against the separatists would amount to granting an amnesty to “coup plotters”.

Some facts about Catalonia:

- Catalonia is an **autonomous community in the north-eastern corner of Spain.** Catalonia consists of **four provinces: Barcelona, Girona, Lleida, and Tarragona.**
- It is **bordered by France (Occitanie) and Andorra to the north,** the Mediterranean Sea to the east, and the **Spanish autonomous communities of Aragon to the west and Valencia to the south.**
- Since the 2010s there has been growing support for Catalan independence. On **27 October 2017, the Catalan Parliament declared unilateral independence** following a disputed referendum.

Topic 32. WORLD BANK’S LENDING CAPACITY COULD GET A \$100B BOOST FROM NEW PLEDGES

Important for the subject : International Relations

World Bank Group President Ajay Banga proposed new contributions from wealthy countries combined with **balance sheet changes could boost the bank’s lending capacity by \$100**

billion to \$125 billion over a decade the contributions would come outside the bank's normal shareholding structure and regular country contributions to the International Development Association fund for the poorest countries.

- China, India and Brazil got larger shareholding in the bank in a 2018 capital increase and would likely want more say in a future capital increase.
- World Bank Group (WBG) uses **trust funds**, a financing arrangement set up with contributions from one or more development partner, to complement core funding from the International Bank for Reconstruction and Development (IBRD), the International Development Association (IDA), and the International Finance Corporation (IFC), in support of the World Bank Group's goals.
- The Bank borrows the money it lends. It has good credit because it has large, wellmanaged financial reserves. This means it can borrow money at low interest rates from capital markets all over the world to then lend money to developing countries on very favorable terms.
- The Bank's financial reserves come from several sources – from funds raised in the financial markets, from earnings on its investments, from fees paid in by member countries, from contributions made by members (particularly the wealthier ones) and from borrowing countries themselves when they pay back their loans.
- The Bank lends only a portion of the money needed for a project. The borrowing country must get the rest from other sources or use its own funds. Eventually, since the country has to pay back its loans, it ends up paying for most, if not all, of the project itself.

India and World Bank Group

- India is a member of four of the five constituents of the World Bank Group viz., International Bank for Reconstruction and Development (IBRD), International Development Association (IDA), International Finance Corporation (IFC) and Multilateral Investment Guarantee Agency (MIGA).
- India is not a member of ICSID (International Centre for Settlement of Investment Disputes).
- India has been accessing funds from the World Bank (mainly through IBRD and IDA) for various development projects.
- India is the number one recipient of WB funds.

How does World Bank work ?

- The World Bank is not really a bank – it's more a way for the **countries of the world to borrow money as cheaply as possible**, so that developing countries can take out cheap loans to help tackle poverty and inequality.
- It gets its money from borrowing on international capital markets. The 188 countries that are members of the World Bank each declare a certain amount of money that they are willing to pay into the Bank.
- This gives the bank the money and security to basically borrow as cheaply as possible

from international credit markets. If you are an investor, you know that the World Bank is a pretty safe place to lend your money, as it is backed up by all the world's richest countries.

- As the World Bank can borrow very cheaply, it means it can lend out loans to developing countries at a very low interest. So in short, it's a way for developing countries to access cheap loans, which they would never be able to do in the normal credit markets, as they would be seen as too risky borrowers

The World Bank comprises five institutions managed by its country members:

- The **International Bank for Reconstruction and Development (IBRD)**, which provides loans to middle-income and creditworthy lower-income countries; the **International Development Association (IDA)**, which provides interest-free long-term loans, grants, technical assistance, and policy advice to low-income developing countries.
- The **International Finance Corporation (IFC)**, which provides loans and loan guarantees and equity financing to the private sector in developing countries.
- The **Multilateral Investment Guarantee Agency (MIGA)**, which provides loan guarantees and insurance to foreign investors against loss caused by non-commercial risks in developing countries;
- and the **International Centre for Settlement of Investment Disputes (ICSID)**, which does not provide finance and is responsible for the settlement of investment disputes between foreign investors and their clients
- In **2014**, the Bank established its **twin goals**, aimed at **measuring success in promoting sustainable economic development**:
- To **end extreme poverty by 2030**, by decreasing the **percentage of people living on less than \$1.90 day** (increased from \$1.25 in 2015) to **less than 3 per cent** of the global population, and to **promote shared prosperity**, by **improving the living standards of the bottom 40 per cent of the population** in every country.

Topic 33. WHAT IS FIVE EYES INTELLIGENCE ALLIANCE?

Important for the subject : International Relations

The 'Five Eyes' is a multilateral intelligence-sharing network shared by over 20 different agencies of five English-speaking countries — **Australia, Canada, New Zealand, the United Kingdom** and the **United States**.

- It is both surveillancebased and signals intelligence (SIGINT). Intelligence documents shared between the member countries are classified '**Secret—AUS/CAN/NZ/UK/US Eyes Only**,' which gave the group its title 'Five Eyes.'

Historical background:

- The origins of the **FVEY** can be traced to **informal secret meetings during World War II** between British and American code-breakers.
- The treaty called the **British-U.S. Communication Intelligence Agreement, or BRUSA**

(now known as the UKUSA Agreement), was signed between the **State Army-Navy Communication Intelligence Board (STANCIB) of the U.S.** and the **London Signal Intelligence Board (SIGINT) of Britain.**

- Its scope was limited to “communication intelligence matters only” related to “unrestricted” exchange of intelligence products in six areas: collection of traffic; acquisition of communication documents and equipment; traffic analysis; cryptanalysis; decryption and translation; and acquisition of information regarding communication organisations, practices, procedures, and equipment.
- The arrangement was later extended to ‘second party’ countries —Canada joined in 1948, while Australia and New Zealand became part of the alliance in 1956.
- It was **started before the US formally entered the war**, followed by the **Allies’ 1941 Atlantic Charter** that **established their vision** of the post-war world.

Topic 34. REMEMBERING M.S. SWAMINATHAN’S LEGACY OF ECOLOGICAL CONSERVATION

Important for the subject: Environment

Dr. M. S Swaminathan, the renowned agricultural scientist known as the **Father of India’s Green Revolution**, passed away at his residence in Chennai on September 28 at the age of 98.

- The **Padma Vibhushan** awardee was **Director General of the Indian Council of Agricultural Research** and headed the **International Rice Research Institute** in the **Philippines**. He was the **first to get the World Food Prize** and used the proceeds from the prize to establish the renowned MSSRF nonprofit trust.

Ecological conservation approach of Dr. Swaminathan:

- His original biography – “**Scientist and Humanist – M.S.Swaminathan**” – was written by **R.D. Iyer**.
- He worked extensively on **four aspects of conservation**: mangrove ecosystem, biodiversity conservation, genetic conservation and Keystone Dialogues (which pertained to plant genetic resources and biological diversity).
- **Centre of diversity for mangrove species**: Aims to maintain the genetic diversity of the ecosystem of the Indo-Malaysian region.

His approach for ecological conservation includes:

- Every country should achieve harmony between human and animal populations, and the natural resource endowments.
- Unless the livelihood security of people was strengthened, conservation of unique natural endowments could become a lost cause in poor and overpopulated countries.
- He argued for the need for an **international Protocol on Biosafety** under the **Convention on Biological Diversity**. He supported the **conservation of native breeds** to counter the potential negative impact of crossbreeding.

- He had formulated an educational programme “**Every Child a Scientist**” to sensitize children of the country’s biological heritage and conservation methods. It is a programme for promoting the theme of conservation agriculture.
- In 1984 he became the **President of IUCN** and emphasized that: IUCN must be **Earth-centric** rather than **Euro-centric**. Poor and hungry should get as much attention as saving pandas and penguins. He asked for promoting afforestation in Africa to reduce the food crisis.
- He developed a **three-pronged hunger elimination strategy**. He emphasized that our common future depends upon our common present, and that **bridging the nutrition divide is fundamental to bridging all other divides**.

Topic 35. EU TO CONTAIN GREENWASHING BY 2026

Important for the subject :Environment

The **European Union (EU)** is all set to contain **greenwashing** by On September 19, 2023, the EU finalized a new **draft rule banning advertisements that mislead customers** with false sustainability promises.

- The rule will impose stricter guidelines on environmental claims, mandating verifiable proof of recognised performance.
- This will likely prevent the businesses from making tall general environmental claims like “environmentally friendly”, “natural”, “biodegradable”, or “climate neutral” without evidence.
- The claims based on emissions offsetting that label products as neutral, reduced or positive, based on their environmental impact, are banned under the new regulation.
- The result also contains the **Green Claims Directive** and the **Carbon Removal Certification Framework (CRCF)**.

EU green deal:

- The **Green Deal** is a set of legislative proposals that attempts to put the EU on a green transitional path with the objective of achieving carbon neutrality by 2050.
- The new regulations contribute towards the EU’s larger goals to attain net zero emissions by 2050.

Carbon Market Watch (CMW):

- **Carbon Market Watch** is an **independent, not-for-profit watchdog and research organization** with unique expertise in carbon pricing and a track record of shaping and influencing international and European climate policy.
- Our strengths lie in **evidence-based advocacy to improve climate policymaking**, turning complex issues into comprehensible messages, and helping people understand and influence those policies.

Greenwashing:

- It refers to “the practice of making products, activities, or policies seem more environmentally friendly or less environmentally damaging than they actually are.”

Topic 36. BIOINVASIONS ARE A GLOBAL THREAT TO ECOSYSTEMS, SAYS IPBES REPORT***Important for the subject : Environment***

Over **3,500 harmful invasive alien species** have been introduced into regions and biomes around the world by human activities, says an assessment report.

- The **global economic cost of invasive alien species**, that negatively impact nature and people, exceeded **\$423 billion annually in 2019**. Costs have at least quadrupled every decade since **1970**.
- **About 60%** of species extinctions are attributable to invasive alien species either solely, or in combination with other drivers.
- **About 90%** of documented global extinctions of native species, attributed mainly to invasive alien species, have occurred on islands, especially remote islands.

Threats from Invasive Alien Species (IAS):

- The first comprehensive global report on invasive alien species and their control, published by
- The spread of invasive species is **one of the five major threats** to biodiversity and ecosystem services.
- **Multiple anthropogenic activities** have introduced more than **37,000 alien species** to regions and biomes around the world, with the number rising at **200 new alien species** every year.
- A conservative estimate from **India** suggests that over the last 60 years, invasive species have cost the **Indian economy \$127 billion**.
- A pan-India monitoring of invasive plants for the last **16 years** suggests that **one-time control of invasive plants across India** would necessitate **\$13.5 billion**, with uncertain outcomes.

Impact on Island nations and indigenous communities:

- Most countries lack a national legislation or regulations directed specifically towards the prevention and control of invasive alien species.
- **90%** of documented global extinctions attributed mainly to invasive alien species have occurred on islands, especially remote islands with high levels of endemism.

Bioinvasion:

- A **bioinvasion** occurs when a species that originally exists in a certain part of the planet is intentionally or, more often, accidentally introduced into an entirely new location.

- This happens, for example, whenever a ship carrying fruit cargo also carries in a new species of spider among the fruit, or parasites on the ship mascot, or burrs stuck on the captain's jacket.
- **“Invasional meltdown hypothesis”** where various invader-invader interactions facilitate further invasions. Interactions among invasive alien species can enable further biological invasions.

Negative impact of bioinvasion:

- The more we human beings travel to all parts of the globe, the more bioinvasions we spread.
- The negative impacts of bioinvasions are far-reaching, affecting the economy, food security, water security and human health.
- The spread of **South American shrub Lantana camara** impacted the livelihoods and wellbeing of the **Soliga Adivasis in Karnataka**.

Positive impact:

- **Prosopis juliflora**, an invasive alien tree. **Charcoal** made from the tree is a source of income for local communities and hence attempts at managing the species have been problematic.

Topic 37. TAMIL NADU AND KERALA MAY JOIN HANDS TO COUNT ENDANGERED NILGIRI TAHR

Important for the subject: Environment

Species in news

Tamil Nadu is in consultation with **Kerala** to conduct the census of its state animal and southern India's only mountain ungulate, **Nilgiri Tahr**.

- For the first time drones may be used as the **Nilgiri tahr** prefers **montane grasslands** at an altitude between **300 and 2,600 meters above sea level**.
- The **nilgiri tahr's habitat** ranges between the **Nilgiris in the north** and the **Kanniyakumari hills in the south**.
- **Their habitat include:** The Nilgiris hills; Siruvani hills; Anamalais, high ranges and Palani hills; Srivillipudur, Theni and Tirunelveli hills; and the Kalakad Mundanthurai Tiger Reserve and Ashambu hills.
- Among these, the Anamalai hills and the Nilgiris, mainly the Mukurthi National Park, are home to the highest number of the animals.
- This would be the **first comprehensive, exclusive census for the State animal**. It will be conducted with the help of **Wildlife Institute of India (WII)**.

Counting technique:

- For counting techniques it will take help from **WWF-India**, the **Nature Conservation**

Foundation, and the WWII.

Counting methods could be:

- Bounded count, double-observer survey methods or/and Camera traps.

Threats:

- Nilgiri tahr habitats face threats in the form of the spread of invasive plants such as wattles, pines, and eucalyptus in the grasslands.

About Nilgiri Tahr:

- The **Nilgiri tahr (Nilgiritragus hylocrius)** is an ungulate that is **endemic to the Nilgiri Hills** and the **southern portion of the Western and Eastern Ghats** in the states of **Tamil Nadu and Kerala** in southern India. It is the **state animal of Tamil Nadu**.
- Despite its local name, it is more closely related to the sheep of the **genus Ovis** than the **ibex and wild goats** of the **genus Capra**. **It is the only species in the genus Nilgiritragus.**
- Its population has been estimated at **3,122 in the wild**, as per the **WWF-India census of 2015**. **Eravikulam National Park** is home to the largest population.

Project Nilgiri Tahr:

- **India's first Nilgiri Tahr project** to conserve the **State animal of Tamil Nadu** will be taken up at a cost of ₹25.14 crores.

About the project:

- Announced during the Tamilnadu state budget 2022-23. The project will be implemented over the span of five years- 2022-27.
- The project will have **nine components**, including **bi-annual synchronised surveys** across the division, **diagnosis and treatment for affected individuals** and the **Shola grassland restoration pilot in Upper Bhavan**.
- Project Nilgiri Tahr of Tamil Nadu Forest **aims** to restore the fragmented habitat, especially Shola grasslands where it thrives, reintroduce the Tahr population in its historic habitat and ensure proper rehabilitation facilities are provided.

Eravikulam National Park

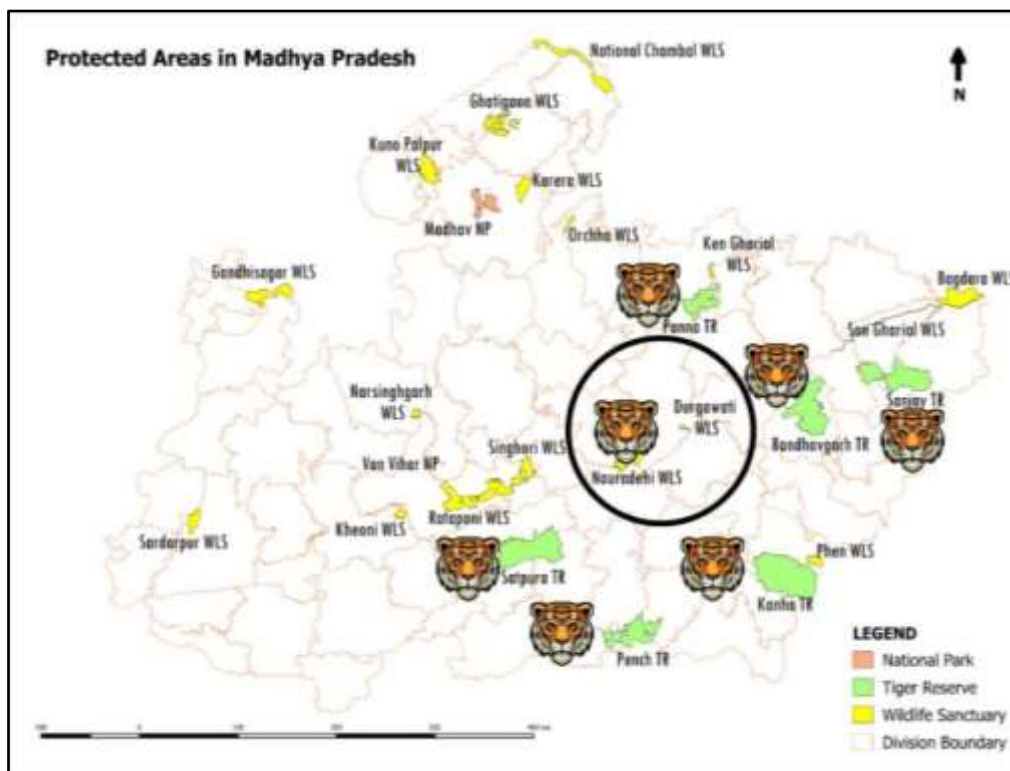
- Eravikulam National Park is a protected area **located in the Idukki district of Kerala, India**. It was established in **1978 to protect the endangered Nilgiritahr**, which is endemic to the Western Ghats.
- Eravikulam National Park is **located in the Western Ghats**, in the Idukki district of Kerala. It covers an area of 97 square kilometers.
- Eravikulam National Park is **known for its unique montane grassland ecosystem**, which is found in the **higher altitudes of the Western Ghats**. Highest peak south of the

Himalayas – the **Anamudi** is located here.

- Park receives heavy showers during the southwest (June/July) and retreating (October/November) Monsoons and is one of the wettest area of the World.
- The park is home to a number of endemic plant species, including the Neelakurinji, which blooms once every 12 years.
- The park is home to a number of species of mammals, birds, and reptiles. The most famous resident of the park is **the Nilgiritahr**, a species of mountain goat that is endemic to the Western Ghats.
- Other mammal species found in the park include the **Indian muntjac, Indian porcupine, and stripe-necked mongoose**. The park is also home to a variety of bird species, including the Nilgiri pipit, Nilgiri wood pigeon, and Nilgiri flycatcher.
- The Nilgiritahr population in the park has been **threatened by habitat loss and poaching**. The park also faces **threats from invasive plant species and tourism related activities**.

Topic 38. ‘VEERANGANA DURGA VATI TIGER RESERVE’ BECOMES MADHYA PRADESH’S 7TH PROTECTED HABITAT FOR BIG CATS

Important for the subject : Environment



Madhya Pradesh, which is home to the most number of tigers in the country, has got a new protected area for the big cats named ‘**Veerangana Durgavati Tiger Reserve**’, the **seventh** in the state.

Tiger reserves in M.P.:

- M.P. was home to **six tiger reserves** – Kanha, Bandhavgarh, Satpura, Panch, Panna and

Sanjay-Dubri.

- **Veerangana Durgavati Tiger Reserve** is the 7th tiger reserve of the state. The previously notified **eco-sensitive zone of Nauradehi and Veerangana Durgavati sanctuaries** and the surrounding forest areas have been included in the notified buffer area.
- The areas including this tiger reserve are already notified as sanctuary or ecosensitive areas.

Tigers in Madhya Pradesh:

- As per the report ‘**Status of Tigers: Co-predators & Prey in India-2022**’, released by the **National Tiger Conservation Authority and Wildlife Institute of India, MP (785)** has the highest number of tigers in the country, followed by **Karnataka (563)** and **Uttarakhand (560)**.

Veerangana Durgavati tiger reserve:

- Veerangana Durgavati Wildlife Sanctuary is a wildlife sanctuary in **Damoh district of Madhya Pradesh, India**.
- Named after **Rani Durgavati**, a queen of the **Gondi people**, and covering an area of only **24 sq km**. **Flora:** consisting of hills, valleys and plains with several streams flowing through them. The **vegetation** is predominantly **tropical mixed dry deciduous forest** and some **teak forests** with trees accounting for **70** of the **121 species of plants** found here.
- **Fauna:** The sanctuary hosts **18 species of mammals**, including the **leopard, wolf, jackal, Indian fox, the striped hyena and sloth bear** besides several **species of deer**. Besides these, the sanctuary is also home to **177 species of birds, 16 species of fish and reptiles** and **10 species of amphibians**.

Topic 39. COMBING OPERATIONS HELD AT MUKURTHI NATIONAL PARK, ADJOINING AREAS

Important for the subject: Environment

The Forest department conducted combing operations in the **Mukurthi National Park and forest areas** adjoining it to ensure that there is no illegal movement of people and poachers.

Vigil has been stepped up in **Mukurthi National Park (MNP)** following the poaching of a tiger by a group of poachers from North India in Avalanche earlier this year and following the suspected poisoning of at least one tiger in Emerald Field staff conducted **combing operations** in **Nadugani in Gudalur forest division, Kolaribetta, Western Catchment and Mukurthi Peak**, encompassing **Nilgiris forest division** and the MNP.

About Mukurthi National Park:

- MNP is a 78.46 km² (30.3 sq mi) protected area located in the **western corner of the**

Nilgiris Plateau west of Ootacamund hill station in the northwest corner of Tamil Nadu state in the Western Ghats mountain range of South India.

- It is **bordered** on the west by Nilambur South Forest Division, to the northwest by Gudalur Forest Division, to the northeast, east and southeast by Nilgiri South Forest Division and to the south by Mannarghat Forest Division. At its southwest tip the peaks of this park straddle the northeast corner of Silent Valley National Park of Kerala. The park was created to protect its keystone species, the Nilgiri tahr. The park is characterized by montane grasslands and shrublands interspersed with sholas in a high altitude area of high rainfall, near-freezing temperatures and high winds.
- It is home to an array of **endangered wildlife**, including royal Bengal tiger and Asian elephant, but its main mammal attraction is the Nilgiri tahr. The park was previously known as Nilgiri Tahr National Park.
- The park is a part of Nilgiri Biosphere Reserve, India's first International Biosphere Reserve. As part of the Western Ghats, it is a UNESCO World Heritage Site since 1 July 2012. Toda people reside here.

Topic 40. HYBRID SEEDS ARE BECOMING INCREASINGLY POPULAR IN INDIA. BUT THAT IS NOT GOOD NEWS; HERE IS WHY

Important for the subject: Environment

Fiji disease virus (FDV):

FDV belongs to the reoviridae family and infects plants. It is one of the few plant viruses in the Reoviridae family.

- The type species of the genus Fijivirus, it is the only known member of Fijivirus group 1. Fiji disease virus is named after the country in which it was originally observed.

What are hybrid seeds?

- In agriculture and gardening, hybrid seed is produced by deliberately **crosspollinated plants** which are genetically diverse.
- Hybrid seeds are used to **improve the characteristics of the resulting plants**, such as **better yield, greater uniformity, improved color, disease resistance**. An important factor is the **heterosis or combining ability of the parent plants**.
- Crossing any particular pair of inbred strains may or may not result in superior offspring.

Hybrid seeds in India:

- The **origin of hybrids** can be traced to **India's Green Revolution in the 1960s**, when the government's effort was primarily to **increase agricultural productivity**.
- For this, the **National Seed Corporation** was set up to develop, store and distribute high yield variety seeds.
- Till the **1980s**, the **public sector had a firm control on the seed market** and supplied **open pollinated variety (OPV)** seeds to farmers.

- From the **1990s** onwards, the government allowed development and distribution of **hybrid varieties by private players**.
- This trend has continued, but **poses a threat to the country's crop diversity** and the **traditional varieties that are more suited to the local climates**.

Increasing demand for hybrid seeds:

- Over the decades, the popularity of hybrid seeds has been increasing among farmers in India.
- Hybrid varieties get ready for **harvest quickly** as compared to **traditional varieties** (these are handpicked by farmers from the field after harvest for use next year, and the process can be replicated for generations) or the **open pollinated variety (OPV) seeds** (these are mostly developed by agricultural universities and can be used for five to seven years).
- The **quicker harvest quality of hybrid seeds** gives farmers a window to sow **short-duration crops**, such as **potato**, between two crop cycles.
- The **25th report of the Standing Committee on Agriculture** says that in **India**, hybrid seeds are mostly developed and sold by national and multinational private sector firms, and that the **share of private sector in India's seed market has increased from 57.3 per cent in 2017-18 to 64.5 per cent in 2020-21**.
- A 2019 report by **Indian Council of Food and Agriculture** says that the country's seed market reached a value of **US \$4.1 billion in 2018**, registering a **growth rate of 15.7 per cent in 2011-18**, and is expected to grow at **13.6 per cent in 2019-24**, reaching a value of **US \$9.1 billion by 2024**.

Wheat and paddy account for about 85 per cent of this seed market.

- Of the two crops, **hybrid seeds are only available for paddy in India**, and occupy about **6 per cent** of the country's 44 million hectares under rice.

Disadvantages of hybrid seeds:

- Sensitive to temperature and rain unlike the traditional varieties. **Example:** a local wheat variety called **goda dhan** even grows in areas with severe water shortage.
- Rise in cases of crop failure of hybrid varieties. The yield of hybrid seeds decrease after 2-3 years. Price fluctuations as the control of price is in the hands of manufacturers of the hybrid seeds.
- **Lack of support from the government**, for example: In **1993**, the government launched a **OPV paddy variety** called **PR-Indira**. It had a yield that matched hybrid varieties and was quite popular. But it was suddenly taken back in 1998.
- Hybrid seeds damage the diversity of crops. The great genetic diversity of crops were replaced by a narrow genetic range of crops. Sometimes the yields of hybrid varieties are exaggerated.
- The **Protection of Plant Varieties and Farmers' Rights Act, 2001**, has changed community ownership of seeds to individual, which favours seed breeders and developers.

Topic 41. THIS MARINE BACTERIUM COULD BECOME A MAJOR THREAT TO COASTAL POPULATIONS IN THE FUTURE

Important for the subject: Environment

Vibrio vulnificus:

Vibrio vulnificus is a species of **Gram-negative, motile, curved rod-shaped (vibrio), pathogenic bacteria** of the genus **Vibrio**.

- Like humans have **Escherichia coli** in our gut, fish have **Vibrios** in their gut. But only a few harm them. Present in **marine environments** such as estuaries, brackish ponds, or coastal areas, **V. vulnificus** is related to **V. cholerae**, the **causative agent of cholera**.
- At least **one strain of V. vulnificus** is **bioluminescent**. These pathogens **thrive in the tropics or subtropics**, where sea or brackish water temperatures reach **20°C** or higher. They also prefer **waters with low salinity**.
- **Increasing seasonal ocean temperatures** and **low-salt marine environments** like estuaries favor a greater concentration of **Vibrio** within **filter-feeding shellfish**;
- **V. vulnificus** infections in the **Eastern United States** have increased eightfold from **1988–2018**.
- Infection with **V. vulnificus** leads to rapidly expanding **skin infections** by entering a wound causing cellulitis or even sepsis.
- **V. vulnificus** is also a source of **foodborne illness**. It was first isolated as a source of disease in 1976.
- People can get **V vulnificus** by eating infected **raw shellfish** (which results in diarrhoea, vomiting, fever) or by exposing wounds to waters where the bacteria live (which can cause life-threatening flesh-eating disease that kills about 20 per cent of the infected in one or two days).
- **High phytoplankton blooms** are associated with increased **V vulnificus infections and deaths**.
- Treatment becomes difficult when the **bacteria enter the bloodstream**. And when people are already **immunocompromised**.
- The **risk is even higher** among people with comorbidities such as chronic liver disease, cancer, chronic kidney disease and diabetes.

Northward move:

- The species has also been moving northwards at 48 km per year.
- Earlier till the **1980s**, the bacteria was **rare in the northern region of Europe and USA**. Now they have a **presence in the Northern part of the USA, Northern Europe, Baltic sea region, South Korea, Taiwan, Japan, and Mexico**.
- The **first case of pathogenic V vulnificus in marine organisms** was documented in **Japanese eel in 1975**. The pathogen arrived in **Spain** through **imported eels in 1985**.
- It produces a **toxin** that is thought to interfere with the **eel's immune system**. It also infects other organisms such as **derbio** (*Trachinotus ovatus*), **tilapia** (*Oreochromis sp*),

trout (*Oncorhynchus mykiss*) and **shrimp** (*Penaeus vannamei*).

Cases in India:

- In **2018, India** documented an outbreak of **V vulnificus** in a **tilapia** farm in **Kerala**. Originally from **Africa and West Asia**, **tilapia** is one of the most traded food fish globally.
- The **European Centre for Disease Prevention and Control** has developed **Vibrio Map Viewer**—a tracker for **Vibrio** species to calculate the **infection risk index** based on sea **surface temperature** and **sea surface salinity**.

Topic 42. WHEN CITIZENS TAKE OWNERSHIP OF URBAN COMMONS

Important for the subject : Environment

Urban commons are public spaces or spaces of public interest that, through the direct care and management from the communities, challenge the traditional mechanisms of public authorities and market, providing new social and cultural responses.

- The urban commons is a relatively new concept developed over the last decade but has its roots in the long historical and intellectual lineage ranging from the enclosure movement in England to the classic essay Hardin 1968 to the Nobel prize-winning work
- Ostrom 1990, including many examples of community-governed common pool resources.

Topic 43. BIHAR TO GET SECOND TIGER RESERVE IN KAIMUR DISTRICT

Important for the subject : Environment



Bihar is set to get its second tiger reserve in Kaimur district- **Kaimur wildlife sanctuary**.

- Earlier **Dholpur-Karauli TR** of **Rajasthan** became the **54rd tiger reserve** of the country. The **Valmiki Tiger Reserve (VTR)** in **West Champaran district**, is currently the **1st and only tiger reserve of the state**.
- A report of the **NTCA** said that the **tiger population in the Valmiki reserve** has **increased** from **31** in 2018 to **54**.
- The **total tiger count** in the State currently is **54**. There is a need for the **second tiger reserve** in the state as **Valmiki TR** has reached its saturation point of **50 tigers**.

Kaimur Wildlife sanctuary:

The **Kaimur district** is divided into two parts:

- **hilly area** which is also known as **Kaimur plateau** and, The **plain area** on the western side which is flanked by the **rivers Karmnasa and Durgavati**.
- The district has a **large forest cover** and is home to **tigers, leopards and chinkaras**.
- The **forests of Kaimur span 1,134 sq km area** including **986 sq km of the Kaimur Wildlife Sanctuary**. At **34%**, **Kaimur** also has the **highest green cover in Bihar** and the **Kaimur forests are the biggest** in the State in terms of area.
- The district shares its boundary with neighboring States of **Jharkhand, Uttar Pradesh and Madhya Pradesh**.
- **Kaimur Wildlife Sanctuary** is situated in **Kaimur District** and **Rohtas District** of Bihar. It is the **largest sanctuary in the state**.
- **Vegetation:** Tropical Dry Mixed Deciduous, Dry Sal Forests, Boswellia Forests and Dry Bamboo Brakes.
- There are several **waterfalls** of which the finest are **Karkat Waterfall, Manjhar Kund, Dhua Kund**.

Topic 44. BIOLOGISTS IN SLOW AND STEADY RACE TO HELP NORTH AMERICA'S LARGEST AND RAREST TORTOISE SPECIES

Important for the subject: Environment

U.S. wildlife officials finalized an agreement with Ted Turner's Endangered Species Fund for the release of more **Bolson tortoises** on the media mogul's ranch in central New Mexico.

- The "**safe harbor agreement**" will facilitate the release of captive tortoises on the **Armendaris Ranch** (lies in **south central New Mexico** along the **Rio Grande River**) to establish a free-ranging population.
- The **ranch** is proving to be an ideal spot. The landscape is similar to that where the tortoises are found in **Mexico**, and work done on the ranch and at the **Living**
- **Desert Zoo and Gardens** in **Carlsbad** has resulted in more than 400 tortoises being hatched since 2006.

About Bolson tortoises:

- It is the **largest and rarest land reptile**, as well as the **rarest of the six Gopherus species native to the North American Continent**. Adult males are generally smaller than females in this species.
- The tortoise is a **land-dwelling reptile** that spends more than **95%** of its time in a burrow that it constructs with its shovel-like front feet.
- All foraging, nesting and mating activities take place during the tortoise's active season from roughly April to October.
- The average lifespan of a Bolson tortoise is not known but probably lies upward of a century.
- **Distribution:** This species at present, is restricted to a relatively **small area of the grasslands of north-central Mexico** in the states of **Chihuahua, Coahuila and Durango**, where it exists in disjunct sub-populations.
- Fossil records also show it was once present in the southern Great Plains, including parts of Texas and Oklahoma. **Conservation status IUCN: Critically Endangered**

Topic 45. JPMORGAN BOND INDEX INCLUSION

Important for the subject: Economy

JPMorgan on Friday said it will include India in its widely tracked emerging market debt index, setting the stage for billions of dollars of inflows into the world's fifthlargest economy.

Impact of JPMorgan bond index inclusion

- It can boost foreign fund flows into the debt market
 - It will lower India's cost of funding
 - It will enhance the liquidity
 - It will broaden ownership base of Gsecs
 - It will bolster the rupee
 - It will lower the cost of borrowing for government, corporates, and banks
 - It can help to finance its fiscal and current account deficit.
- India will be included in JP Morgan's GBIEM Global index suite from June 28 next year.
- India's weightage is set to increase to a maximum of 10 per cent in the GBIEM Global Diversified and 8.7 per cent in the GBIEM Global index. Currently, 23 Indian government bonds (IGBs) with a combined notional value of \$330 billion are index eligible.
 - GBIEM GD accounts for \$213 billion of the estimated \$236 billion benchmarked to the GBIEM family of indices. Only IGBs designated under the Fully Accessible Route are index eligible.

What is Emerging markets bond index (EMBI)?

- The emerging markets bond index (EMBI) **tracks the performance of emerging market bonds** and was first published by investment bank JP Morgan.
- Emerging market bonds are **debt instruments issued by developing countries**, which

- tend to carry **higher yields** than government or corporate bonds of developed countries.
- Emerging markets bond indexes are used as **benchmarks for bond performance** in emerging markets.
 - Emerging market debt or bonds are considered **sovereign debt**. These government bonds are typically issued in **foreign currencies**, either in US dollars, euros, or Japanese yen.
 - Because of the increased economic and political risk present in these countries, the **credit rating on emerging market bonds tend to be lower** than that on developed market bonds. Due to the perceived higher risk of investing in these assets. Alternately the **sovereign bonds have higher yields for investors than that of more stable bonds in developed countries**.
 - The index is **weighted on the basis of the market capitalization of government bonds**, but it is the sub-index with the greatest liquidity requirements, so some markets are excluded.
 - When one puts money in an index fund, that **cash is then used to invest in all the companies that make up the particular index, which gives you a more diverse portfolio than if you were buying individual stocks**.

Are there any other indices?

- There are two other major indices: **Bloomberg Global Aggregate Index** and **FTSE EM index**

Topic 46. WHAT ARE THE REASONS FOR THE RISE IN GLOBAL DEBT?

Important for the subject: Economy

Global debt rose to an all-time high of **\$307 trillion** in the second quarter, by the end of June 2023, the **Institute of International Finance (IIF)** said in a report.

Global debt:

- Global debt refers to the **borrowings of governments as well as private businesses and individuals**.
- Governments borrow to meet various expenditures that they are unable to meet through tax and other revenues and to pay interest on the money that they have already borrowed to fund past expenditures.
- The private sector borrows predominantly to make investments.
- Global debt has risen by about **\$100 trillion** over the last decade. Further, **global debt as a share of gross domestic product (GDP)** has started to **increase** once again to hit **336%** after dropping quite steeply for seven consecutive quarters.

Why is it rising?

- Both **global debt in nominal terms** and **global debt as a share of GDP** have been **rising steadily** over the decades.
- **Reason:** Due to the **rising interest rates (as a result of the increase in oil prices)**,

which was expected to adversely affect demand for loans.

- **Most (over 80%)** of the rise in global debt in the first half of the year has come from **advanced economies** such as the **U.S., the U.K., Japan, and France**.
- Among emerging market economies, **China, India and Brazil** have seen the most growth in debt.

Probable consequence of rising global debt:

- It will increase the costs of debt servicing for developing countries. But **a rise in debt levels over time is to be expected** since the **total money supply usually steadily rises each year** in countries across the globe.
- Even a simple rise in the total amount of savings in an economy can cause a rise in debt levels as these increased savings are channeled into investments.

Inflating away of debt:

- It refers to the phenomenon wherein the central bank of a country either directly or indirectly uses freshly created currency to effectively pay off outstanding government debt by, for example, purchasing government bonds in the market.
- But the creation of fresh money causes prices to rise, thus imposing an indirect tax on the wider economy to pay the government's debt.

Is it a cause of worry?

- Concern over the **sustainability of such debts**, mainly **government debts**, as the government borrows money to fund populist policies and when the central bank raises the interest rates, it will become difficult for the government to service their debts.
- As the **interest rate is extremely low**, particularly in western economies, **debt servicing remains largely manageable**.
- Now, due to **high inflation**, the central banks are increasing interest rates, that may cause a worry.
- In its report, the **IIF** has also warned that the **international financial infrastructure** is not equipped to handle unsustainable domestic debt levels.
- Unsustainable private debts sometimes lead to unsustainable economic booms like the **2008 global financial crisis**.

Institute of International Finance (IIF):

- The **IIF** is the **global association of the financial industry**, with about **400 members from more than 60 countries**.
- The IIF provides its members with **innovative research, unparalleled global advocacy, and access to leading industry events** that leverage its influential network.
- Its **mission** is to support the financial industry in the prudent management of risks; to develop sound industry practices; and to advocate for regulatory, financial and economic policies that are in the broad interests of its members and foster global financial stability

and sustainable economic growth.

- **IIF members** include commercial and investment banks, asset managers, insurance companies, professional services firms, exchanges, sovereign wealth funds, hedge funds, central banks and development banks.

Topic 47. ANTIDUMPING PROBE INITIATED AGAINST 3 CHINESE PRODUCTS

Important for the subject: Economy

India has suo motu initiated anti-dumping investigations on as many as three different products from China in the last few days as part of its overall effort to guard MSME units against the onslaught of cheap imports from neighbouring countries.

The three products are telescopic channel drawer sliders, fasteners and unframed glass mirrors.

- **Three separate notifications** have been initiated by the Director General of Trade Remedies (DGTR) for suo motu initiation of anti-dumping probe. This follows on the heels of India initiating anti-dumping probe on sulphur black and certain vacuum flasks from China.
- Move intended to protect MSME units from Chinese imports onslaught Industry observers noted that this is probably the first time India had initiated suo motu anti-dumping investigations on three different products at the same time.
- In 2022-23, nearly 72 percent of Indian demand of 1.10 lakh tonnes was accounted for by imports from China.
- In the case of fasteners, Apt Tools and Machinery along with Northern Screw Association filed a representation before DGTR seeking anti-dumping duty on nuts, bolts and screws from China. Most of the domestic producers are MSME units.
- In 2022-23, India's merchandise trade deficit with China stood at \$83 billion. It maybe recalled that the anti-dumping directorate's first ever suo motu investigation was in the year 2000 on dry batteries from China. Duties were imposed on dry batteries for a period of five years. **Concept**
- Anti-dumping duties are imposed when it is conclusively proved that a **particular item is being exported at a price lower than what is prevailing in the domestic market of the exporter** and is leading to disruption in the domestic market, injuring the local producers
- An anti-dumping duty is a **protectionist tariff** that a domestic government imposes on foreign imports that it believes are priced below fair market value.
- Dumping is a process where a company exports a product at a price lower than the price it normally charges in its own home market.
- The duty is aimed at ensuring fair trading practices and creating a level-playing field for domestic producers vis-a-vis foreign producers and exporters.
- The duty is imposed only after a thorough investigation **by a quasi-judicial body**, such as Directorate General of Trade Remedies, in India. The imposition of anti-dumping duty is **permissible under the World Trade Organization (WTO) regime**

Topic 48. HOW TO MEASURE INDIA'S GROWTH

Important for the subject :Economy

While the recently released economic growth numbers for India are promising, there is some sub-text that needs to get the correct and more realistic picture of India's economic performance.

Some of the major concerns are: **inflationary pressures, a falling rupee, fluctuations in tax revenue streams and an apprehensive outlook on the agriculture sector** in Q1 FY24,

- Thus a reading of the Indian growth story based just on quarterly numbers may be ignoring some major concerns.
- The Q1 data covering the GDP growth rate from April to June of FY24 boasts a **nominal growth rate of 8%** and a **real growth rate of 7.8%**. These are calculated by the **National Statistics Office (NSO)**.

The major issues are as follows:

- NSO made use of the **income approach** of calculating GDP rather than the **expenditure approach**. The assumption generally is that both methods lead to similar results. expenditure approach dictates headline growth to be 4.5% rather than 7.8% which is a large discrepancy.
- Another essential statistical operation is the **adjusting for inflation using the price deflator**. In this case, deflation due to **falling commodity prices**, reflected in the wholesale price index, has **worked to overstate the real growth**.
- There is also the problem of a **base effect** from the COVID-19 degrowth period, Further future worries are there regarding inflation and a weakening rupee, and revenue concerns:
- It is doubtful if the inflation rate calculated through the consumer price index can be sustained at current levels with the impending depreciation of the Indian rupee.
- Rupee depreciation against the dollar is due to **capital outflow** pressures resulting from the RBI's reluctance to raise interest rates.
- India is a net importer, and its most significant import consists of crude petroleum, whose price seems to be rising due to Saudi's \$100 per barrel push and rupee depreciation.
- Moreover, the government's tax **revenue from direct taxes has weakened** over the previous quarter while the indirect tax revenue remained strong, indicating a **K-shaped pattern**.
- The income streams from progressive taxation (more significant tax burden on those higher on the income ladder) seem to be a laggard compared to its **regressive counterpart**
- Direct and personal taxes should (in the absence of any significant policy changes) have grown closer to the nominal growth rate than it has currently.

Terms

- The income approach involves summing up all national incomes from the factors of

production and accounting for other elements such as taxes, depreciation, and net foreign factor income.

- **The deflator** is meant to adjust growth figures when they are overstated by inflation.
- A **K-shaped recovery** is a post-recession scenario in which one segment of the economy begins to climb back upward while another segment continues to suffer.
- If illustrated, the economic growth would roughly resemble the two diverging diagonal lines of the letter “K” — hence the name.

Topic 49. AIFS MAY BE ALLOWED TO ISSUE PARTICIPATORY NOTES FROM IFSC

Important for the subject : Economy

Alternative investment funds (AIF)s may be allowed to issue participatory notes from IFSC. A Working group formed to assess viability of extending the facility of issuing PNs by AIFs.

- The **International Financial Services Centres Authority (IFSCA)** is mulling allowing alternative investment funds (AIFs) to issue **offshore derivative instruments (ODIs)** or participatory notes from GIFT IFSC.
- P-notes allow overseas investors to take indirect exposure to Indian securities without registering with the country’s market regulator.
- This year’s **Budget recognised ODIs as a valid contract** if issued by offshore banking units registered as foreign portfolio investors (FPIs) in the **International Financial Services Centre (IFSC)**.
- At present Sixty-three AIFs are currently registered at IFSC but not all of these are FPIs.

How it works:

- An **AIF** registered in IFSC will take up an FPI licence. It will buy, say, RIL shares listed on National Stock Exchange or BSE and issue a contract against that in IFSC to a non-resident or foreign investor.
- Accordingly, the AIF in IFSC will hold the RIL shares and pass on the returns to the investor at an appropriate date.

How AIF different from FII?

- Regulations will have to be tweaked to allow AIFs to manage a segregated portfolio.
- FIIs are operated as arms of foreign banks, typically get into one-on-one contracts with investors that want to invest in P-notes.
- AIFs, however, cannot get into such contracts. That’s because **these funds are pooled vehicles**, with returns linked to units that are assigned a common net asset value.
- Transfer of P-notes or distributions made by an offshore banking unit at an IFSC to a foreign investor is currently exempt from tax. A similar provision will have to be made available for AIFs as well.
- Note: Earlier **P-notes** were issued with cash equities, debt or derivatives as underlying.
- In **2018**, the **market regulator banned FPIs** from issuing P-notes with derivatives as

underlying, except for hedging purposes.

- At its peak, P-note issuances formed 7-8 per cent of total FPI assets under custody. This has dwindled to about 2 per cent post the ban.

Topic 50. WHAT'S THE LINK BETWEEN GDP GROWTH AND EMPLOYMENT IN INDIA

Important for the subject: Economy

It is generally believed that fast GDP growth will automatically bring about employment. But this is not necessarily correct, as the growth can be with or without much employment generation.

- For a country like India, with surplus labour, growth is expected to be labour intensive, unlike labour scarce countries where growth is capital intensive. But this does not always hold true as can be seen in the case of India.
- **How to compare employment generation in relation to growth?** A good way to measure this relationship is to look at **employment elasticity of growth** — **it is the extent to which employment grows when GDP grows by one unit.**
- It is calculated by dividing the employment growth rate by the output growth rate.

Employment Elasticity:

- Employment elasticity is a **measure of the percentage change in employment associated with a 1 percentage point change in economic growth.**
- The employment elasticity **indicates the ability of an economy to generate employment opportunities** for its population as per cent of its growth (development) process.
- **An employment elasticity of 1** implies that with every 1 percentage point growth in GDP, employment increases by 1%. **An employment elasticity of 1 denotes that employment grows at the same rate as economic growth.**
- **Elasticity of 0** denotes that employment does not grow at all, regardless of economic growth.
- **Negative employment elasticity** denotes that employment shrinks as the economy grows. This is crucial as it is commonly believed that economic growth alone will increase employment.
- The **negative employment elasticity in agriculture** indicates movement of people out of agriculture to other sectors where wage rates are higher.
- However, the **negative employment elasticity in the manufacturing** sector was a cause of concern particularly when the sector has shown positive growth in output.
- Jobless growth means that the high growth in GDP did not accompany a similar growth in employment, resulting in a **low Employment Elasticity.**

Recent trend in employment elasticity:

- As can be seen, employment elasticity has consistently fallen between 1983 and 2017, showing that a 1% increase in GDP leads to a less than 1% increase in employment.
- It is noteworthy how employment elasticity went up so sharply in the last few years. Highlighted in circles, we can see that non-farm employment growth rate improved during this period.
- It is also true that the employment elasticity calculation was helped by the fact that the **non-farm output growth (the denominator in this formula) also fell quite sharply.**
- In addition the majority of employment generation in this phase has been self employment.
- In **2020-21** (pandemic year) **regular wage employment fell by 2.2 million.** But this net change hides an **increase in formal employment by 3 million** and a **loss of about 5.2 million of semi and informal regular wage employment.**

State of Working India (SWI 2023)

- The study has been brought out by the Centre for Sustainable Employment within the **Azim Premji University.**
- SWI 2023 report has used official employment and unemployment data to arrive at the results.
- SWI and it focuses on a long-run view of India's structural transformation experience and its implications for three key social identities: caste, gender, and religion.
- SWI 2023 analyses data from 1983 to 2023 and uses a whole host of official data sources including **Periodic Labour Force Surveys (PLFS), the National Family Health Surveys (NFHS), as well as Census 2011 and Economic Census 2013** among others.

Topic 51. NEW ANGEL TAX RULES BRING CLARITY TO VALUING STARTUP INVESTMENTS

Important for the subject : Economy

In News: The amended rules are aimed at bridging the gap between the rules outlined in FEMA and the Income Tax.

- The Income Tax department has notified rules for valuation of equity and compulsorily convertible preferable shares issued by startups to resident and non resident investors.
- As per the changes in Rule 11UA of I-T rules, which comes into effect from September 25, the Central Board of Direct Taxes (CBDT) provides that the valuation of compulsorily convertible preference shares (CCPS) can also be based on the **fair market value** of unquoted equity shares.
- The change is significant as most of the investments in India by VC funds is through the CCPS route only.
- Extension of 10% safe harbour to CCPS investments as it was earlier meant for equity shares will give necessary margin of safety for taking care of foreign exchange fluctuations.

What are the benefits:

- The amendments to Rule 11UA of the Indian Income Tax Act bring positive changes by offering taxpayers flexibility through multiple valuation methods, simplifying the valuation date consideration, incentivising venture capital investments, facilitating investments from notified entities, providing clarity on CCPS and encouraging foreign investments.

Angel Tax

- The CBDT had in May come out with draft rules on valuation of funding in unlisted and unrecognised startups for levying income tax, commonly termed as ‘Angel Tax’ and had invited public comments on it.
- The amended rules are aimed at bridging the gap between the rules outlined in FEMA and the Income Tax.
- So far, only investments by domestic investors or residents in closely held companies or unlisted firms were taxed over and above the fair market value. This was commonly referred to as an angel tax.
- The Finance Act, 2023 has said that such investments over and above the FMV will be taxed irrespective of whether the investor is a resident or non-resident.
- Post the amendments in the Finance Act, concerns have been raised over the methodology of calculation of fair market value under two different laws. This amendment aims to correct that.
- Note: Angel investors are wealthy private investors focused on financing small business ventures in exchange for equity. Unlike a venture capital firm that uses an investment fund, angels use their own net worth.

Topic 52. SEBI MAY SET UP PANEL TO CLEAR THE ‘PROMOTER’ TAG MUDDLE

Important for the subject : Economy

In News: Securities and Exchange Board of India (SEBI) may set up a committee under Association of Investment Bankers of India (AIBI).

- AIBI an industry body representing investment bankers, will take up the issue of promoter classification of founders and investors of companies headed for initial public offerings.

What is the problem?

- Many issuers have identified themselves as professional managers, not promoters, in draft prospectus for the initial public offering (IPO)
- A promoter has to be identified at the time of filing the **draft red herring prospectus** for an IPO.
- Several issuers in the past had identified themselves as professionally managed

companies **without an identifiable promoter**.

- SEBI has been **nudging founders** with a stake of **10 per cent or more** to classify themselves as promoters at the time of filing the draft prospectus for public share sales.

Obligations of promoters:

- The minimum promoters' contribution of 20 per cent has to be locked in for 18 months post-listing. In addition, the promoter tag comes with higher regulatory obligations.
- This could especially impact new-age companies where the founder's holdings could be low because of frequent equity dilution to private equity (PE) players ICDR Regulations (Issue of Capital and Disclosure Requirements) define a promoter as someone who is in control of the company
- Currently, **there are no regulations on minimum promoter holding**, which is why regulators are grappling with the distinction between promoters and founders.

Topic 53. GIFT

Important for the subject : Economy

MCA, DEA in talks on direct listing rules for startups Corporate Affairs Ministry (MCA) is in talks with the Department of Economic Affairs (DEA) in the Finance Ministry to frame rules for enabling the direct listing of Indian companies, including startups, on overseas exchanges at the GIFT City in Gujarat.

- GIFT City is the country's sole International Financial Services Centre (IFSC). Government is currently focused on enabling direct listing of Indian companies in GIFT City before looking at allowing them to list directly overseas.
- This would enable startups and companies of like nature to access the global market through GIFT IFSC.
- Currently, Indian companies can access overseas equity markets only through depository receipts or by listing their debt securities on foreign markets.
- The Centre had in **2020 amended the Companies Act allowing the direct listing of Indian companies on foreign stock exchanges**, but the necessary framework has not been put in place so far.

Topic 54. PRIVATE EQUITIES, VENTURE CAPITALS CASH IN ON MARKET RALLY

Important for the subject :Economy

Offers for sale in last five 5 years much higher than fresh issuances. Offers for sale by private equity (P/E) and venture capital (VC) firms have been significantly higher than fresh issuances of capital between 2018 and 2023.

Private equity (PE)

- Private equity (PE) is a form of financing where money, or capital, is invested into a

privately held company.

- Typically, PE investments are made into mature businesses in traditional industries in exchange for equity, or ownership stake.
- PE is a major subset of a larger, more complex piece of the financial landscape known as the private markets.

How does private equity work?

- To invest in a company, private equity investors raise pools of capital from limited partners (LPs) to form a fund.
- Once they've hit their fundraising goal, they close the fund and invest that capital into promising companies.
- PE investors may invest in a company that's stagnant or distressed, but still shows signs for growth potential.
- When a PE firm sells one of its portfolio companies to another company or investor, the firm usually makes a profit and distributes returns to LPs that invested in its fund.
- Some PE-backed companies may also go public.

What is a private equity firm?

- A private equity firm is a type of investment firm. They invest in businesses with a goal of increasing their value over time before eventually selling the company at a profit.
- Similar to venture capital firms, PE firms use capital raised from limited partners (LPs) to invest in promising private companies.
- Unlike VC firms, PE firms often take a **majority stake—50% ownership** or more—when they invest in companies.
- Private equity firms usually have majority ownership of multiple companies at once. A firm's array of companies is called its portfolio, and the businesses themselves, portfolio companies.

PE funds vs. hedge funds

- Both private equity funds and hedge funds are restricted to accredited investors. However, the biggest differences between PE funds and hedge funds are fund structure and investment targets.
- **Hedge funds** tend to operate in the **public markets**, investing in publicly traded companies while PE funds focus on private companies.

Unique characteristics of private equity:

- PE firms often invest in mature businesses in traditional industries. Using capital committed from LPs, PE investors invest in promising companies—typically taking a majority stake (>50%).

Unique characteristics of venture capital:

- VC firms often invest in tech-focused startups and other young companies in their seed.
- Using committed capital, VC investors usually take a minority stake (<50%) in the companies they invest in.
- Most of these companies are not fully established or profitable, so they can be risky investments—but with that risk comes the opportunity for big returns.
- **Sales** by PEs and VCs amounted to around **\$26 billion** compared with about **\$10.4 bn** worth of capital issuances.
- Sell-down is quite concentrated in the case of promoter sales but broad-based across sectors in the case of PE investors.

What does the selling indicate?

- Selling by promoters largely reflects strategic compulsions such as debt management.
- Selling by PE players reflects tactical or price considerations. PE and VC players have made exits via the Initial Public Offering (IPO) route and also sold share in block deals in the secondary market.
- The exits have accelerated in the current year thanks to a **strong rally** in the markets.
- A good appetite from both foreign and domestic institutional investors as also retail investors has helped them sell either their entire stakes or pare their holdings.

Changed holding in public companies:

- As a result of promoter sell-downs, the promoter holding in the BSE-200 Index has fallen to 48.8% in the June quarter (for which the data is available) from 50.3% in the December, 2022 quarter.
- The combined holding of domestic investors (Mutual Funds, local institutions and retail investors) has increased by 90 basis points to 23.5% at the end of the June quarter.
- The holding of Foreign Portfolio Investors has increased by a modest 26 bps to 21.7% over the same period.
- The holding of others (AIFs, PMS fall under this category) has increased 31 bps to 6%.

Topic 55. PUBLIC DEBT

Important for the subject: Economy

Government's total gross debt increased by 2.2 per cent quarter on quarter to ₹159.53 lakh crore in April-June this fiscal, a Finance Ministry report said. The liabilities stood at ₹156.08 lakh crore at March end. Since Apr-June (Q1) 2010-11, Public Debt Management Cell (PDMC), Budget

- Division, Department of Economic Affairs, Ministry of Finance has been bringing out a quarterly report on debt management on a regular basis. The current report pertains to the quarter April-June (Q1 FY24).
- During Q1 of FY24, the Central Government on issuance/settlement basis of dated securities raised gross amount worth ₹4,08,000 crore and ₹2,71,415 crore after adjusting

for switches.

- The **weighted average yield (WAY)** of issuances during the quarter stood at 7.13% and it was 7.34% for Q4 FY23. The **weighted average maturity (WAM)** of the issuances worked out to 17.58 years for Q1 FY24 and 16.58 for Q4 FY23. The gross amount raised through 91-day, 182-day and 364-day
- Treasury Bills during the quarter amounted to ₹4,96,266 crore while total repayments were ₹3,07,278 crore. During April-June 2023, the cash position of the Central Government remained in surplus mostly.
- Total gross liabilities (including liabilities under the ‘Public Account’) of the Government, as per provisional data, increased marginally to ₹1,59,53,703 crore at end- June 2023 from ₹1,56,08,634 crore at end- March 2023. This represented a quarter-on-quarter increase of 2.2 per cent in Q1 FY24. Further, nearly 26.6 per cent of the outstanding dated securities had a residual maturity of less than 5 years.
- The yield on the 10-year benchmark security softened from 7.31% at the close of the quarter on March 31st, 2023 to 7.12% at the close on June 30th, 2023, thus softening by 19 bps during the quarter.
- In secondary market, trading activities were concentrated in 7–10-year maturity bucket during the quarter mainly because of more trading observed in 10-year benchmark security.
- Private sector banks emerged as dominant trading segment in secondary market during the quarter under review with a share of 22.59 per cent in “Buy” deals and 25.00 per cent in “Sell” deals in the total outright trading activity, followed by foreign banks, public sector banks, primary dealers, and mutual fund.
- On a net basis, foreign banks, insurance companies, private sector banks and primary dealers were net sellers while public sector banks, co-operative banks, FIs, mutual funds and ‘Others’ were net buyers in the secondary market.

What is Public Debt?

- In the Indian context, public debt includes the total liabilities of the Union government that have to be paid from the Consolidated Fund of India.
- Sometimes, the term is also used to refer to the overall liabilities of the central and state governments.
- However, the Union government clearly distinguishes its debt liabilities from those of the states. It calls overall liabilities of both the Union government and states as General Government Debt (GGD) or Consolidated General Government Debt.
- Union government relies heavily on market borrowing to meet its operational and developmental expenditure. The study of public debt involves the study of various factors such as debt-to-GDP ratio, and sustainability and sources of government debt.
- The fact that almost a fourth of the government expenditure goes into interest payment explains the magnitude of the liabilities of the Union government.

What are the types of Public Debt?

- The Union government broadly classifies its liabilities into two broad categories.
- The debt contracted **against the Consolidated Fund of India** is defined as public debt and includes all other funds received outside Consolidated Fund of India under Article 266 (2) of the Constitution, where the government merely acts as a banker or custodian.
- The second type of liabilities is called **public account**.

Internal Public Debt versus External Public Debt

- Over the years, the Union government has followed a considered strategy to reduce its dependence on foreign loans in its overall loan mix.
- **External loans** are not market loans. They have been raised from institutional creditors at concessional rates. Most of these external loans are fixed-rate loans, free from interest rate or currency volatility.
- **Internal debt** constitutes more than 93% of the overall public debt.
- Internal loans that make up for the bulk of public debt are further divided into two broad categories – marketable and non-marketable debt.
- Dated government securities (G-Secs) and treasury bills (T-bills) are issued through auctions and fall in the category of **marketable debt**.
- Intermediate treasury bills (with a maturity period of 14 days) issued to state governments and public sector banks, special securities issued to National Small Savings Fund (NSSF) are classified as **non-marketable debt**.

Sources of Public Debt

- Dated government securities or G-secs.
- Treasury Bills or T-bills
- External Assistance
- Short term borrowings
- Public Debt definition by Union Government
- The Union government describes those of its liabilities as public debt, which are contracted against the Consolidated Fund of India. This is as per Article 292 of the Constitution.

Public Debt Management in India

- As per Reserve Bank of India Act of 1934, the Reserve Bank is both the banker and public debt manager for the Union government.
- The RBI handles all the money, remittances, foreign exchange and banking transactions on behalf of the Government.
- The Union government also deposits its cash balance with the RBI.

Public Debt versus Private Debt

- Public Debt is the money owed by the Union government, while private debt comprises of all the loans raised by private companies, corporate sector and individuals such as

home loans, auto loans, personal loans.

What is Debt-to-GDP ratio?

- The debt-to-GDP ratio indicates how likely the country can pay off its debt. Investors often look at the debt-to-GDP metric to assess the government's ability of finance its debt. Higher debt-to-GDP ratios have fuelled economic crises worldwide.
- The NK Singh Committee on FRBM had envisaged a debt-to-GDP ratio of 40 per cent for the central government and 20 per cent for states aiming for a total of 60 per cent general government debt-to-GDP.

Suggested measures to make public debt sustainable –

- Privatisation of loss-making PSUs
- Prudential stance as per the Fiscal Responsibility Budget Management (FRBM) Act 2003
- Leveraging of Public Financial Management System (PFMS)
- PPP model in social schemes
- Investment in infrastructure
- Harmonisation of tax regime
- Thrust on renewable energy

Topic 56. GANDHI-AMBEDKAR DEBATE ON CASTE-BASED SEPARATE ELECTORATES

Important for the subject: History

In **September 1932**, **Mahatma Gandhi** initiated a life-threatening fast in **Pune's Yerawada Central Jail** to **protest caste-based separate electorates**, a decision **still influential today**.

Fasting was a potent tool in Gandhi's arsenal, serving as personal penance and a means of pressuring those in power due to his immense popularity.

- The "**Gandhi-Ambedkar debate**" revolved around their differing caste perspectives, culminating in **Gandhi's "victory"** reflected in **India's reservation system**.

Differences in Views on Caste:

Aspect Gandhi's Views on Caste

Ambedkar's Views on Caste

Early Perspective

- Supported caste, including restrictions
- Radical, rejected caste as divinely ordained

Approach to Untouchability

- Opposed untouchability, promoted unity

- Advocated for the rejection of untouchability

Role of Caste in Hinduism

- Considered caste vital to Hinduism
- Believed caste needed to be eradicated from Hinduism

Evolution of Views

- Evolved over time, influenced by the Dalit movement
- Consistently radical, emphasized political power for lower castes

Solution to Caste

- Rejected caste but not Hinduism
- Called for rejecting both caste and Hinduism

Differences in Views on Separate Electorates:

Aspect Gandhi's Views on Separate Electorates

Ambedkar's Views on Separate Electorates Rationale

- Opposed separate electorates, saw them as ineffective
- Advocated for separate electorates as a means of political empowerment

Political Power

- Believed lower castes should aspire to broader political representation
- Emphasized that political power was crucial for lower castes to address grievances

Integration vs. Empowerment

- Favored integration, feared divisions within Hinduism Prioritized empowerment and saw separate electorates as a way to prevent domination

Perception of Results

- Thought separate electorates “do too little” for lower castes
- Saw separate electorates as a necessary step toward challenging oppression

Impact on Unity

- Feared that separate electorates would divide
- Hindu community Believed separate electorates could empower lower castes without compromising unity

The Yerawada Fast and the Poona Pact

- In **September 1932**, Gandhi began a fast unto death in **Yerawada Jail, Pune**, protesting caste-based separate electorates, viewing it as a **divine sacrifice for the oppressed**.
- **Ambedkar**, despite reservations, yielded to Gandhi's pressure due to his **immense popularity, signing the Poona Pact**.
- This secured **reservations for lower castes and abandoned the demand for separate electorates**.

The legacy of the fast

- Gandhi's fast is credited with thwarting the British "**divide and rule**" strategy, praised by poet **Rabindranath Tagore** for sacrificing for India's unity.
- **Critics see Gandhi's fast as coercive, leaving Ambedkar no real choice**. Ambedkar questioned **why Gandhi didn't fast against untouchability** and expressed **dissatisfaction with the Joint Electorate system established by the Poona Pact**, which he believed upheld upper-caste control over untouchable representatives.

Topic 57. ADI SHANKARACHARYA STATUE AT OMKARESHWAR

Important for the subject: History

Madhya Pradesh Chief Minister Shivraj Singh Chouhan unveiled the **108- foot-tall 'Statue of Oneness' of Adi Shankaracharya at Omkareshwar**.

- The statue represents **Adi Shankaracharya as a 12-year-old child**, the age he was said to have visited Omkareshwar.
- The statue is intended to endure for more **than 500 years**, while the museum building is designed to have a service life of 100 years.

Who Was Adi Shankaracharya?

- Lived between **788 and 820 AD** and was born in **Kerala's Kaladi**. He became a **sanyasin at an early age**, studied under his **guru Govinda Bhagavatpada**, and became a proponent of **Advaita Vedanta**.
- He authored **116 works**, including commentaries on the **10 Upanishads, the Brahmasutra, and the Gita**.
- During his 32-year lifespan, he visited all the important spiritual centers of the time, including **Kanchi, Kamrup, Kashmir, Kedar, Badri dhams, Sringeri, Ujjain, Kashi, Puri, and Joshimath**.

Why Is the Mandhata Island an Important Religious Destination?

- The **Mandhata island**, located on the **Narmada River**, houses two of the 12 Jyotirlingas – **Omkareshwara and Amareshwara**. It features **Shaivite, Vaisnavite, and Jain temples** from the **14th and 18th centuries**.
- The island's name '**Omkareshwar**' is derived from its shape, resembling the sacred syllable '**Om**'.

- Puranas say that Lord Shiva pierced the world as an endless pillar of light, called the **jyotirlinga**.

There are 12 jyotirlinga sites in India that are considered a manifestation of Shiva:

1. Somnath Jyotirlinga in Gir, Gujarat
2. Mallikarjuna Jyotirlinga in Srisailam, Andhra Pradesh
3. Mahakaleshwar Jyotirlinga in Ujjain, Madhya Pradesh
4. Omkareshwar Jyotirlinga in Khandwa, Madhya Pradesh
5. Baidyanath Jyotirlinga in Deoghar, Jharkhand
6. Bhimashankar Jyotirlinga in Maharashtra
7. Ramanathaswamy Jyotirlinga in Rameshwaram, Tamil Nadu
8. Nageshwar Jyotirlinga in Dwarka, Gujarat
9. Kashi Vishwanath Jyotirlinga in Varanasi, Uttar Pradesh
10. Trimbakeshwar Jyotirlinga in Nasik, Maharashtra
11. Kedarnath Jyotirlinga in Rudraprayag, Uttarakhand
12. Ghrishneshwar Jyotirlinga in Aurangabad, Maharashtra

What Went into Making the 108 ft Statue?

- The **multi-metal** statue is installed atop **Mandhata Parvat hill**, facing southwards toward the **Narmada River**.
- Weighing 100 tons, the statue was conceptualized by an Indian team of artists, sculptors, and engineers, with metal casting done in **China’s Nanchang city**.
- The statue is made primarily of **bronze, containing 88% copper, 4% zinc, and 8% tin**.
- Its **internal structure is made up of high-quality steel**, and it stands on a **75-foot high platform**. At the base of the statue is the **Shankar Stambh**, featuring wooden domes and stone pillars with carvings depicting **32 stories related to Acharya Shankar**.

What Are the Other Projects?

- **Ekatma Dham** includes the **Advaita Lok museum**, showcasing Acharya Shankar’s life and philosophy.
- The museum boasts a variety of **architectural styles**, including “**Nagara, Dravidian, Oriya, Maru-Gurjara, Hoysala, North Indian-Himalayan, and Kerala**.” The **Acharya Shankar International Institute of Advaita Vedanta**.
- The **Maharshi Vedavyasa Advaita Library** serves as a comprehensive resource center for scholars in Advaita Vedanta. A **36-hectare forest** is planned for meditation seekers.

Topic 58. RULES OF CONSTRUCTION AROUND PROTECTED ASI MONUMENTS, AMASR ACT 1958

Important for the subject: History

A Parliamentary panel has observed that the provision of **100-metre prohibited and 300-metre regulated area** around all monuments protected by the Archaeological Survey of India (ASI) has pitted the local community against these heritage structures in many places as they find it difficult to carry out necessary repair work of their residential spaces.

- The **Department Related Parliamentary Standing Committee on Transport Tourism and Culture** has thus asked the government to revise the rules to make them realistic.
- It has also recommended rationalizing the application of such rules based on the historical significance of the monuments.
- In some cases, the entire village is within a radius of 300 metres, which makes it difficult for the entire village to carry out repair work of their residential houses.
- Such a situation in many places creates a **hostile scenario**, pitching the local community against the monuments.
- Another issue is that at present, the **same set of rules apply to both significant and insignificant monuments**.
- For example, the rules above apply identically to the iconic Ajanta and Ellora monuments and Kos Minars, unknown cemeteries and tombs etc.
- It also recommended that the list of all 3,691 ASI-protected monuments be rationalised and categorised based on their national significance, unique architectural value and specific heritage content.
- A quarter of the Centrally Protected Monuments are minor monuments with no national significance. The list includes, for instance, 75 graves of colonial-era soldiers or officials of no notable importance.
- It gave the example of a small brick wall enclosure containing two graves located in Kumta, Karnataka, which is a centrally protected monument under the supervision of the ASI. **The structure had no architectural value, and the individuals were of no historical significance. Yet, they are supposed to get the same level of protection as the country's most cherished monuments.**

Legal Provision: AMASR Act 1958

- The Ancient Monuments and Archaeological Sites and Remains (AMASR) Act, 1958 is one of the landmark laws for the –
- Preservation of ancient and historical monuments and archaeological sites and remains of national importance (over 100 years old).
- Regulation of archaeological excavations and Protection of sculptures, carvings and other like objects. The Archaeological Survey of India (ASI) functions under the provisions of this act.

- The monuments are regularly inspected by the ASI officials to assess their present condition and the necessary conservation and preservation works are taken up as per the requirement.
- In the original Act of 1958, “ancient monument” is defined as “any structure, erection, or monument, or any tumulus or place of interment, or any cave, rock sculpture, inscription, or monolith which is of historical, archaeological, or artistic interest and which has been in existence for not less than 100 years”.
- “Archaeological sites and remains” mean “any area which contains or is reasonably believed to contain ruins or relics of historical or archaeological importance which have been in existence for not less than 100 years”.
- The **prohibited and restricted area provision was introduced in 2010** through an amendment to the Ancient Monuments and Archaeological Sites and Remains (AMASR) Act, 1958. It prohibits and regulates all activities like mining and construction around 100 metres and 300 metres.
- **Section 20** of the Ancient Monuments and Archaeological Sites and Remains (AMASR) Act of 1958, last amended in 2010, **prohibits construction** within a **100 metre** radius of all Archaeological Survey of India (ASI)-protected monuments and **regulates activities** within another **300 metre**.
- **Kos Minars or Mile Pillars** are medieval Indian milestones along the **Grand Trunk Road** that were introduced by the **16th-century ruler Sher Shah Suri**.
- They were **erected to serve as markers of distance** along royal routes

Topic 59. HOYSALA TEMPLES ON UNESCO HERITAGE LIST

Important for the subject: History

The Hoysala temples at **Belur, Halebidu and Somanathapur in Karnataka** were officially inscribed as UNESCO World Heritage Sites during the 45th session of the World Heritage Committee at Riyadh, Saudi Arabia.

Features of Hoysala Temple:

- The Hoysala dynasty ruled over much of South India for close to **200 years** and during this time they built spectacular temples; both Hindu as well as Jain.
- The Hoysala temples are known for **evolving a distinct style** that is ornate with temple architecture following a **stellate plan built on a raised platform**.
- The material used in temple construction is **chloritic schist** which is also known as **soapstone that is soft and amiable to carving**.
- An abundance of **figure sculpture** covers almost all the Hoysala temples. The **garbhagriha (sanctum-sanctorum) houses a centrally placed murti (enshrined icon) on a pitha (pedestal)**.
- The **shikhara (superstructure), rises over the garbhagriha** and together with the sanctum they form the **vimana (or mulaprasada) of a temple**. A **ribbed stone, amalaka**, is placed **atop the shikhara with a kalash at its finial**.

- An intermediate antarala (vestibule) joins the garbhagriha to an expansive pillared mandapa (porch) in front, chiefly facing east (or north).
- The temple may be approached via entrances with gigantic gopurams (ornate entrance towers) towering over each doorway. In the prakaram (temple courtyard) several minor shrines and outbuildings often abound.

What makes the three temples on UNESCO list special:

- Among the surviving Hoysala-era temples, these three are considered **prime examples of Hoysala art**.
- In his work “A History of South India,” K A Nilakanta Sastri notes that the **Chennakesava temple in Belur** features a total of 46 pillars, with all except the four in the central bay designed differently, creating an astonishing variety and complexity.
- It is believed that **Shantala Devi, queen of Vishnuvardhana**, who commissioned the temple, served as the **model for one of its sculptures, known as Darpana Sundari** (lady with the mirror).
- The **Kesava temple in Somanathapura**, designed as a **16-point star**, houses **three shrines dedicated to Keshava, Janardhana, and Venugopala**. Unfortunately, the statue of Keshava in the Somanathapura temple is currently missing.
- The temple in Halebidu is hailed for its **extensive exterior sculpture work**, which is considered **one of the world’s most remarkable monuments** and an unparalleled repository of religious expression in plastic form.
- Halebidu faced a historical setback when it was **raided by Malik Kafur**, a general in the army of Delhi Sultan Alauddin Khalji.

What is UNESCO World Heritage Sites:

- A World Heritage site is a **landmark or area with legal protection by an international convention administered** by the United Nations Educational, Scientific and Cultural Organisation (UNESCO).
- World Heritage sites are **designated by UNESCO** for having **cultural, historical, scientific or other forms of significance**. The sites are **judged to contain “cultural and natural heritage around the world considered to be of outstanding value to humanity.”**

What is the history and background of World Heritage Sites:

- The **concept of World Heritage emerged after WWII** amid concerns over the widespread destruction of cultural sites and nature. Efforts to remedy this led to the drafting of the **1972 Convention Concerning the Protection of the World Cultural and Natural Heritage**, commonly known as the World Heritage Convention.
- It established the framework to preserve the world’s outstanding heritage. The Convention **defines the kind of natural or cultural sites that can be considered for inscription on the World Heritage List** by meeting specified criteria.
- By signing the Convention, **member countries commit to protecting not just national**

heritage but mankind's shared heritage, irrespective of where sites are located.

- **191 State Parties** have ratified this World Heritage Convention, including India. **India formally signed the Convention on November 14, 1977.**
- There are currently **1,172 World Heritage Sites across 166 countries, of which 913 are cultural, 220 are natural, and 39 are mixed properties** that have outstanding universal value as the heritage of humanity.

What is the selection Criteria for UNESCO World Heritage Site

- For a site to be inscribed as a World Heritage Site, it must go through a **rigorous nomination and evaluation process.**
- UNESCO's advisory bodies **the International Council on Monuments and Sites (ICOMOS) and the International Union for Conservation of Nature (IUCN)** assess each nominated site. A site **must demonstrate Outstanding Universal Value (OUV)** by meeting one or more criteria defined in the Convention to make it worthy of special protection for all humanity.

What is the Legal Status of Designated World Heritage Sites:

- Upon inscription, each World Heritage Site retains its **ownership by the respective state, yet the safeguarding and preservation of its Outstanding Universal Value (OUV)** assumes a collective responsibility for all of humanity. The legal implications encompass:
- **Member states bear the obligation** to ensure the **identification, safeguarding, preservation, revaluation, and transmission** of their cultural and natural heritage to future generations.
- States are **anticipated to integrate heritage protection** into regional planning initiatives, **provide regular reports on on-site conditions to the World Heritage Committee,** and abstain from taking deliberate actions that could harm the heritage.
- States are **encouraged to enhance public awareness** and reverence for heritage through educational and informational programs.
- In instances of severe threats to World Heritage, the **Committee can deploy experts to offer assistance.** In extreme cases, the possibility of delisting or imposing sanctions on gravely imperiled sites also exists.

Topic 60. BAL GANGADHAR TILAK AND LORD GANESH FESTIVAL

Important for the subject :History

What is Lord Ganesh Festival:

Ganesh Chaturthi is a **Hindu festival** celebrating the **birth of Lord Ganesha,** who is a symbol of wisdom, prosperity and good fortune.

It is also known as **Vinayaka Chaturthi or Vinayaka Chavithi.** It is a ten-day festival, starting on the **fourth day of the hindu lunar calendar i.e Shukla Paksha and ends on**

Anant Chaturdashi

History of Ganesh Festival and Bal Gangadhar Tilak:

- Before **1893**, the Ganesh festival was a **one-day event**, primarily celebrated privately and was mainly **observed by Brahmins and upper castes** within their households.
- Bal Gangadhar Tilak played a pivotal role in **reshaping the Ganesh festival**. He aimed to mobilize the Indian populace against British colonial rule
- In **1893**, Tilak introduced a **new tradition by turning Ganesh Chaturthi into a community festival**.
- The festival was **no longer confined** to private homes but became a public event. During this transformed Ganesh festival, **patriotic songs were sung, and nationalist ideas were promoted**.
- Tilak used to believe that invoking Indian heroes and using Hindu imagery would help galvanize the people against British rule.
- Tilak's **writings, impassioned speeches, and organizational skills were instrumental in advocating for the public celebration** of the Ganesh festival.

Some facts about Bal Gangadhar Tilak:

- Bal Gangadhar Tilak was **born on 23rd July 1856 in Ratnagiri, Maharashtra**. He founded the **Deccan Education Society (1884)** along with his associate **Gopal Ganesh Agarkar** and others.
- He was also one of the founders of the **Fergusson College (1885) in Pune** through the Deccan Education Society.
- A book '**Indian Unrest**' written by **Valentine Chirol**, an English journalist, stated Tilak the '**father of Indian unrest**'.
- **The All India Home Rule League** was founded by **Tilak in April 1916 at Belgaum**. It worked in **Maharashtra (except Bombay), the Central Provinces, Karnataka and Berar**.
- **Newspapers: Weeklies Kesari (Marathi) and Mahratta (English)**
- **Books: Gita Rhasya and Arctic Home of the Vedas**

Topic 61. HOW THE SIKH MIGRATION TO CANADA BEGAN

Important for the subject :History

Khalistan Movement has taken momentum in Canada after the death of KTF leader Hardeep Singh Nijjar that impacted India-Canada Diplomatic Relations.

History of Sikh Migration to Canada:

Arrival of Sikhs in Canada (1897):

- Sikhs' migration to Canada began with **Queen Victoria's Diamond Jubilee in 1897**.
- **Kesur Singh**, a Risaldar Major in the British India Army, is considered the **first Sikh**

settler who arrived in **Vancouver** as part of the **Hong Kong Regiment**, a group of Sikh soldiers.

First Wave of Sikh Migration (Early 1900s):

- The initial Sikh migration to Canada **occurred in the early 1900s**.
- Many Sikh migrants came to Canada as laborers, working in industries such as logging in **British Columbia and manufacturing in Ontario**. These early immigrants were **often sojourners, intending to work temporarily** in Canada and send their savings back to their home countries.

Challenges and Hostility:

- Sikh migrants faced numerous challenges and hostilities. Locals perceived them as **taking away jobs** from the local population, leading to resentment.
- Sikhs also encountered racial and cultural prejudices as their numbers increased in the country. The situation worsened as more Sikh migrants arrived in Canada.

Canadian Government Regulations (Post-1908):

- Due to **mounting public pressure and concerns** about immigration, the Canadian government introduced strict regulations to limit Sikh migration.
- These regulations included requirements such as **possessing a specific sum of money and arriving in Canada** through a **continuous journey from their home country**.
- The goal was to discourage further Sikh immigration.

Decline in Immigration (After 1908):

- Immigration from India into Canada experienced a **significant decline after 1908**.
- The number of Sikh immigrants went from 2,500 during 1907-08 to only a few dozen per year. The stringent regulations effectively limited the influx of Sikh migrants.

The Komagata Maru Incident (1914):

- In **1914**, a significant incident known as the Komagata Maru incident took place **in Vancouver**.
- The Komagata Maru was a **Japanese steamship** carrying 376 South Asian passengers, including a majority of Sikhs.
- Upon arrival in Canada, the immigrants were **detained onboard the ship for about two months**.
- Canadian authorities eventually **forced the ship out of Canadian waters**, sending it back to Asia.

Tragic Consequences in India:

- When the Komagata Maru arrived in India, an **altercation between British authorities and passengers ensued**.

- British officials suspected the passengers of being revolutionaries, which led to confrontations.
- Tragically, the altercation resulted in casualties, with **22 people dead**, including 16 passengers.

Relaxation of Immigration Policy (Post-WWII):

- After World War II, **Canada's immigration policy began to relax**, driven by several factors.
- Canada found it increasingly challenging to uphold an immigration policy based on racial preferences after joining the United Nations and committing to anti-racial discrimination principles.
- The country's growing economy required laborers, leading to a demand for immigrant workers.
- Additionally, there was a decline in European immigration, prompting Canada to seek human capital from third-world countries.

Introduction of the 'Points System' (1967):

- In 1967, the Canadian government introduced the 'points system' as a new criteria for admission.
- This system **emphasized skills as the primary criteria** for admitting nondependent relatives, effectively eliminating racial preferences in immigration.

Topic 62. LAND AROUND ASSAM MONASTERY TO BE RESERVED FOR INDIGENOUS PEOPLE

Important for the subject :History

The Assam government is working on a law to create an **indigenous-only zone** around **Batadrava**, the **birthplace of 15th-16th century saint-reformer Srimanta Sankaradeva** who propounded **neo-Vaishnavism**.

Batadrava than:

- Batadrava, which is in Nagaon district, is about 130 km east of Guwahati. The land within the **8 km** radius around Batadrava Than will be conserved for **khilonjia (indigenous people) only**.
- 'Than' means a sacred place in Assamese society. **Batadrava Than** is the **first Than or the first institution** set up by **Srimanta Sankaradeva** for propagation of **EKA SARANA NAMA DHARMA** founded by him.
- He also built the 'Monikut' together with **Kirtanghar** or **Namghar** and the 'Cari-Hati' (four clusters of quarters) for accommodation of his disciples.
- This **full-fledged Than complex** came up in **1509**. **Simhasana or Guru Asana** (altar of God) was placed in the **Monikut** with the holy scripture 'Bhagavata' on it without any idol.

- The **Thans** founded by **Srimanta Sankaradeva** are **Gangmou, Belaguri, Patbausi, Kumarkuchi, Sunpora, and Madhupur**. Later many **Sattras** were set up by his followers all over the **Brahmaputra valley**.
- All these were designed like **Batadrava Than**. But of all these **Thans and Sattras, Batadrava Than** is the unique one. Devotees visiting different Thans/Sattras as well as the prominent sacred places and temples in **Jaganath Puri, Brindavan, Badarikasram, Gaya, Kashi etc.** consider **Batadrava** as one of the principal places of worship.

About Srimanta Sankaradeva:

- **Srimanta Sankardev (1449–1568)** was a **15th–16th century Assamese polymath**; a saint-scholar, poet, playwright, dancer, actor, musician, artist socialreligious reformer and a figure of importance in the cultural and religious history of Assam, India.
- He is widely credited with building on past cultural relics and **devising new forms of music (Borgeet), theatrical performance (Ankia Naat, Bhaona), dance (Sattriya), literary language (Brajavali).**

Social contribution:

- He is considered as the **father of the modern Assamese race**. He rescued the people of **Brahmaputra valley** from the regressive medieval practices like **human sacrifice**.

Religious contribution:

- The **Bhagavatic religious movement he started, Ekasarana Dharma** and also called **Neo-Vaishnavite movement**, influenced **two medieval kingdoms – Koch and the Ahom kingdom** – and the **assembly of devotees** he initiated evolved over time into monastic centers called **Sattras**, which continue to be **important socio-religious institutions in Assam** and to a lesser extent in North Bengal.

EKA SARABA NAMA DHARMA religion (Neo- Vaishnavite movement):

- His religion **EKA SARANA NAMA DHARMA** is very simple. There is **no unnecessary ritual** in his order. **Srimanta Sankaradeva** advocated ‘**EKA DEVA, EKA SEVA, EKA BINEY NAHI KEWA**’, which means one should worship none but one God, who is **Lord Krishna**.
- **Batadrava or Bordowa** became the centre of his religious activities. As such, **Batadrava has been regarded as the Dvitiya Vaikuntha (second heaven)**. **Sankardev** inspired the **Bhakti movement in Assam** just as **Guru Nanak, Ramananda, Namdev, Kabir, Basava** and **Chaitanya Mahaprabhu** inspired it elsewhere in the **Indian subcontinent**.

Literary and artistic contribution:

- He has left an extensive literary oeuvre of trans-created scriptures (Bhagavat of Sankardev), poetry and theological works written in **Sanskrit, Assamese and Brajavali**.
- **Srimanta Sankaradeva** used to write scriptures sitting below one **Shilikha (Myrobalan)**

tree near the **Kirtanghar**. That tree is still alive even after **five and half centuries**, which is a wonder.

- He created a **classical dance form** known both as **Sankari dance** and **Satriya dance**. The **Sangeet Nâtak Akâdemi of India** recognized it as a **classical dance form in 2000 AD**.
- **Srimanta Sankaradeva** also developed a **school of classical music**, which is named after him. He created as many as **25 Râgas of his own**. He was also the **first playwright in all modern Indian languages**.
- Above all these, he was the **first prose writer in the entire world**. He introduced the **drop scene and elevated stage in the world of drama** way back in **1468 AD**.
- Srimanta Sankaradeva authored **ten plays** in his life. These were Chihna Yâtrâ, Patni Prasâda, Kâliya Damana, Keli Gopâla, Rukmini Harana, Pârijât Harana, Janma Yâtrâ, Gopi Uddhava Sambâda, Kangsa Badha and Sri Râma Vijaya.
- He initiated a **new form of painting** with his **epoch-making drama-festival Chihna-Yâtrâ** held in **1468 AD**, where he drew the imaginary pictures of heaven to be used as backdrops.

Topic 63. MORE WOMEN BECOME ODHUVARS IN TN TEMPLES

Important for the subject : History

TN Govt appoints 15 Odhuvars, of which 5 are women.

Who are Odhuvars?

Odhuvars are devotional singers dedicated to Siva Temples. They sing the sacred *Thevaram* hymns as musical offerings to the Deity as part of the structured temple worship.

- Rigorous training in the **Thirumurai texts** and **Thevaram music** is imparted to them at an early age.
- They have to sing from the *Thirumurai* during each puja and also during special functions and festivals.
- In the past, they were supported with honorariums by Kings.

What is Thevaram and Thirumurai?

- **Thevaram** are **hymns sung by Saivite Saints** roughly 1,300 years ago.
- **Thevaram** denotes the **first seven volumes of the twelve-volume collection Tirumurai**, a Shaiva narrative of epic and Puranic heroes, as well as a hagiographic account of early Saiva saints set in devotional poetry.
- The **Thevaram** volumes contain the works of the **three most prominent Shaiva Tamil poets** of the 7th and 8th centuries: **Sambandar, Appar, and Sundarar**.
- **Consisting of 800 sacred hymns to the Hindu God Shiva**, **Thevaram** dates back to the **7th and 8th century**.

Topic 64. SC ORDERS STATUS QUO ON APPOINTMENT OF PRIESTS IN AGAMIC TAMIL NADU TEMPLES

Important for the subject : History

The Supreme Court ordered status quo regarding appointment of **archakas** (priests) in Tamil Nadu temples governed by the **Agamic tradition**.

The plea urged the court to quash all consequential orders by which the state attempted to interfere with the **hereditary scheme of appointing archakas of a particular denomination in Agama temples** by throwing it open to those from other denominations, too, who had done a one-year certificate course for archakas in schools run by the government.

- It pointed out that “prominent Shaivite and Vaishnavite temples in Tamil Nadu were built according to **Agamas** and worship therein is as per Agamas”.
- The plea contended that despite rulings by SC and Madras HC, the state government “in scant regard for law, is now attempting to appoint non-believers as archakas, only with a view to destroy temples in the state.
- It is well settled that a secular Government does not have the power to interfere with **essential religious practices**, as such a right is well protected under the Constitution of India.
- Agamas undoubtedly pertains to an essential religious practice, which cannot be tampered with by a secular Government”.
- It added that experience in Agamas is not secured by one year certificate courses but by years of rigorous training under learned Gurus.

Who are Archakas (Priests)?

- It is derived from the word **archa** meaning to adore, worship, praise, sing, or salute with honor and respect.

Archana is the act of worship and archaka is the worshipper.

- **Archi means an emanation or a ray of light, or flame.** They obtain **Deekshai or Samskara** (initiation) from their **Guru/Acharya**, who is most often their respective fathers, at a very early age viz. between five and seven years and undergo rigorous Vedic education for a minimum period of three years.
- Thereafter, they are groomed to perform **Poojas** and **Homams** for another three to five years before taking over as Archakas.
- An archaka is one who worships an **archa**, meaning an image of God. In traditional Vaishnavism, **an archa is a living incarnation of God in image form.** The archa itself may be made of stone, wood, clay, gemstones, gold, silver, bronze, or alloys, but will be treated as an embodiment of God.

- In Vaishnavism an archaka is verily considered, without any doubt, Hari himself (**archakastu hari sakshat chara rupi na samsayah**). We find a similar approach in Saivism also.
- In terms of importance, the archakas occupy the foremost place in society because by worshipping the deities properly as stipulated in the scriptures, and keeping them happy, they prevent misfortune and calamities befalling upon people and ensure peace, prosperity, and welfare of all.

Worship in Hinduism:

- In Hinduism worshippers can worship their personal deities **externally (bahya)** with specific prayers and offerings or **internally (antah) with visualization**.
- Spiritually, the **mental worship (manasa puja)** is considered more effective. A devotee may perform the external worship either directly without any intermediary or indirectly with the help of a trained priest. He may also conduct the worship at home, in a temple or at a sacred place.
- Traditionally, worship in Hindu temples is performed by priests, who are known as **archakas** and **yajakas**. **In Vaishnava temples, you invariably need the assistance of a priest to worship the deities.**
- However, **in Saiva temples, you can either worship the deity directly or with the help of a temple priest.**
- The priests also have several **local or vernacular titles** such as **pujari, devaswami, maharaj, etc.**

What are Agamas and Tantras?

- Agamas and Tantras are a vast collection of knowledge and form a major portion of spiritual literature and practices.
- Like the Veda, they have come down through **Guru-Shishya parampara**, in **oral traditions**.
- Agamas form the base for many of the popular as well as specialist aspects of Hinduism.
- The word **Agama** means **‘that which has come to (us)’**. **Tantra** means **‘that which protects with detail’**.
- Sruti, the eternal word, is said to be of two forms – Nigama (Veda) and Agama. Agama and Tantra are in general grouped under the same class of literature. There are three main classes of Agamic/Tantric texts: Vaishnava Agamas, Saiva Agamas and Sakta Tantras, though not limited to these.
- **The Vaishnava and Saiva texts are generally called Agamas, while the word Tantra in general applies to Sakta texts.** However, technically Tantra is a part of Agama and owing to the centrality of Tantra the two words are used often interchangeably.
- **Agama Shastra** is a manual for worship, rituals and construction of temples in Hinduism. In Sanskrit, **agama** means **“handed down by tradition”** and shastra refers to a commentary or treatise.
- The Agama texts are considered authoritative and hold significance in the **appointment**

and training of temple priests.

- Agama Principles emphasize the importance of **following precise rituals and procedures to maintain the sanctity** and spiritual efficacy of the temple.
- **Agamas expound a variety of Important for the subjects and could be called the guides to a huge range of Hindu practices.**
- They contain Manuals for worship Methods for salvation, Yoga Devata, Yantra Prayogas using various mantras Temple Building, Town planning Iconometry Domestic practices and civil codes Social/Public festivals Holy Places Principles of Universe, Creation and Dissolution Spiritual Philosophy Worlds Austerities, and many other interrelated Important for the subjects.

What are the Legal and Historical Aspects of Temple Priest Appointments?

Legal Aspects:

- **Article 15 prohibits discrimination on the grounds of religion, race, caste, sex, or place of birth.** It states that the State shall not discriminate against any citizen on these grounds **in matters of employment or access to public places.**
- **Also, states have the authority to regulate religious institutions** and their affairs, including the appointment of temple priests. State legislation may prescribe **qualifications, procedures, and eligibility criteria** for such appointments.

Historical Aspects:

- In many Hindu temples, the tradition of **hereditary appointments** has prevailed, where temple priesthood is passed down within specific families or castes.
- Temples often follow **Agama scriptures that provide guidelines for temple rituals** and practices. This practice is often based on the **belief in ancestral knowledge and purity of lineage.**
- However, in some regions **open competitions or selection based** on qualifications are also prevalent.

SC Judgements regarding Temple Priest Appointments

Seshammal & others vs. State of Tamil Nadu (1972):

- The SC held that the appointment of an Archaka (temple priest) is a **secular function**, and the **performance of religious service by the priests is an integral part of the religion.**
- The court **differentiated between the secular and religious aspects** and stated that the prescription provided by the Agamas (scriptures) is significant only for the performance of the religious service.
- **Any individual, regardless of caste or creed, can be appointed as an Archaka** if they are well-versed and qualified in the Agamas and the rituals required for temple worship.
- Based on this decision of the SC, the Madras HC in this case has held that **ancestry**

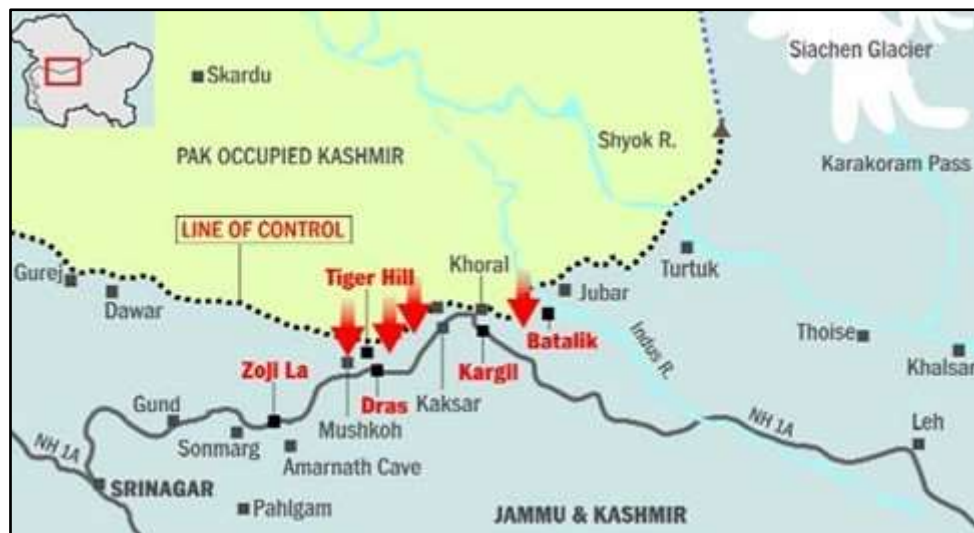
based on caste will have no role to play in the appointment of Archaka if the person so selected otherwise satisfies the requirements.

N. Adithayan vs. Travancore Devaswom Board (2002):

- The SC rejected the customary claim that **only Brahmins (in this case Malayala Brahmins)** can perform rituals in temples.
- The court ruled that **trained individuals qualified to perform the puja in an appropriate manner** can carry out the rituals.
- The SC emphasized that the restriction of **only Brahmins performing rituals** in certain temples was due to historical reasons, such as limited access to Vedic literature and sacred initiation.

Topic 65. KAOBAL GALI-MUSHKOH VALLEY, THE BATTLEFIELD OF KARGIL WAR, OPENS UP FOR TOURISTS

Important for the subject: Geography



Source of this article:

The **high-altitude passes of the Gurez valley in north Kashmir** are all set to connect with the **Mushkoh valley, in Kargil's Drass Sector, Ladakh**, the site of the war in **1999**. The **130-km road** has been opened up for tourists. **Kaobal Gali, the highest pass at a height of 4,166.9 metres in Gurez**, connects the two valleys.

Gurez valley:

- Located in the **Kashmir valley**. The valley lies near the **Line of Control**, which separates it from the **Astore and Neelum districts of Pakistan-administered Kashmir**. Being situated very close to the **Burzil Pass**, which leads into **Astore**, the inhabitants are **ethnic Dards/Shins**.
- They **speak the Shina language** and have the same styles of dress and culture as their kinsmen in **Pakistani-administered Gilgit-Baltistan**.

- **Zumba yak** (smaller than other yaks) is found in the Buduaab village, Gurez valley. **Gurez valley** was one of the sites of the **Kargil war**.
- The **Gurez valley** is close to the **Line of Control (LoC)** with the **Kishanganga river** demarcating the line in several parts.
- The **Gurez valley** is **one of few habitations in Kashmir where villages with only log houses exist**, with no intervention of urban concrete materials.
- It has diverse fauna and wildlife including the **Himalayan brown bear** and the **snow leopard**. It is also home to **ibex, musk deer and marmots**.
- The **Gurez valley**, with about **38,000 residents**, is already setting a record by hosting **50,000 tourists this year so far**.

Mushkoh valley:

- Situated in **Dras (Ladakh)** and Also known as the **valley of wild tulips**. The **Mushkoh valley**, dotted with **meadows of flowers**, was in the news when **Tiger Hill** witnessed a bloody battle between **India and Pakistan**, leaving hundreds of soldiers dead on both sides. The meadows of Mushkoh offer boisterous **wild tulip flowers**. The valley is also home to the **endangered Himalayan yew**.

Topic 66. CENTRE ASKS STATES TO PROMOTE HEAT TOLERANT WHEAT SEEDS IN THE RABI SEASON

Important for the subject :Geography

The Centre has asked States to promote **heat resilient and high yielding varieties of wheat** among farmers in the background of 5% drop in monsoon this year.

National Conference on Agriculture for Rabi Campaign 2023-24:

- Organized by: **Department of Agriculture and Farmers Welfare**
- **Aim:** Agro-ecological suitable and need based Crop Diversification to be promoted in the country.
- The conference was to **review crop performance** during the preceding crop seasons and **fix crop-wise targets** for the **rabi season** in consultation with **State governments**, and prepare a roadmap to ensure **supply of critical inputs** and facilitate adoption of innovative technologies to enhance production.
- Centre is targeting an increase in the coverage of area under **heat-tolerant wheat varieties** to **60%** this season.
- Severe deficit in the reservoirs due to interrupted monsoon in **Bihar, Andhra Pradesh, Tamil Nadu, Uttar Pradesh, West Bengal, Kerala, and Karnataka** compared with the 10-year average.
- As per the **third advance estimates (2022-23)**, the **production of food grains** in the country is estimated at **3,305 lakh tonnes**, which is higher by **149 lakh tonnes** than the previous season.
- Record production is estimated of **rice, maize, gram, pulses, rapeseed, and mustard**,

oilseeds, and sugarcane. Total pulses and oilseeds production during 2022-23 is estimated at a record **275** and **410 lakh tonnes**, respectively.

- The **food grain production** in the country had **increased by 31%** in the **last eight years** from **251.54** to **330.54 million tonnes**.
- The **Mustard Mission** implemented for the last **3 years** enhanced **rapeseed & mustard production** by **37%** from **91.2** to **124.94 lakh tonnes**.

Seed rolling plan:

- Preparation of **Seed Rolling Plan** is basically an exercise by which the **states assess the seed requirement** in different crops grown in and its suitable varieties (for **Kharif and Rabi seasons**) as per prescribed **seed rate**, the area under crop/variety, its seed replacement rate three years in advance.
- The **second exercise** is to identify different seed production agencies to which targets will be assigned in the preceding year to meet the seed requirement.
- The **Seed Rolling Plan for FY 2023-24** is a statement of seed requirement for sowing of **Kharif-2024** and **Rabi 2024-25 crops** and a statement of agency-wise seed production targets assigned in **Kharif-2023** and **Rabi 2023-24** to meet the seed requirement.

Topic 67. BALSAMS IN FULL BLOOM ADD TO VISUAL TREAT IN MUNNAR

Important for the subject :Geography

Balsams (genus Impatiens) are in full bloom in Munnar. Called **Kasithumba** and **Onappovu** locally, its small, pink flowers are a major attraction along the **Devikulam stretch** of the **Kochi-Dhanushkodi National Highway**.

Balsams:

- **Balsams** are also known as '**touch-me-not**' because of the bursting of mature seeds and seed distribution. Of the **220 balsam species** in India, **135** are found in the **southern Western Ghats**. More than 30 species of balsams in the **Periyar Tiger Reserve**. 46 balsam species spread from **Munnar, Chinnar, Bison Valley** and **Eravikulam National Park**. **Anamudi**, the highest mountain in the Western Ghats, and the surrounding high ranges are known for the **diversity of wild balsams**.

Humid habitats:

- The **normal life cycle of balsams** is from **June to December**. The plant mainly grows inside pockets of forest areas.
- With the loss of specific habitats, many species have become **rare, threatened, or even extinct**. This fleshy orophytic herb usually prefers humid habitats and completes the life cycle in the rainy season. **Balsams are a major indicator species of climate change**. The large-scale flowering of balsams indicates that microclimate is still active in the Munnar hill station.

Topic 68. SEEDS WITH MULTIPLE TOLERANCE WILL BE A GAME-CHANGER: BORLAUG AWARD WINNER SWATI NAYAK

Important for the subject: Geography

Dr. Swati Nayak, a scientist from **International Rice Research Institute (IRRI) South Asia Regional Centre (ISARC)** and known for research works in climate resilient and nutritious rice varieties, recently **won Borlaug Field Award** by the **World Food Prize**.

- Dr. Nayak had organized more than **10,000** on-farm and comparative testing for more than **500 climate resilient, high-yielding, bio-fortified and healthier seed varieties**.
- Dr. Nayak said developing **high yielding inbreds (non hybrids)** from our old seed varieties and focussing on **climate resilient and climate responsive varieties** rich in **micronutrients** have been the innovations of this decade.
- Next decade of research and innovations should focus on **low glycemic index varieties of rice which are with micro nutrients**.
- **Glycemic index (GI)** is a measure of (on a scale of 0 to 100) how quickly a food can make your blood sugar (glucose) rise. **Only foods that contain carbohydrates have a GI**. Foods such as oils, fats, and meats do not have a
- GI, though in people with diabetes, they can affect the blood sugar. In general, low GI foods increase glucose slowly in your body. Foods with a high GI increase blood glucose quickly. The efforts are also to develop seeds with multiple tolerance– floods, droughts and pests.
- **Kala Namak** seed variety of **paddy** found in eastern India. **Kalanamak** is a scented rice of Nepal and India.
- This variety has been in cultivation **since the original Buddhist period (600 BC)**. It is popular in **Himalayan Tarai of Nepal i.e., Kapilvastu, and eastern Uttar Pradesh**, where it is known as the **scented black pearl**. It was featured in the **book Speciality rices of the world** by the **Food and Agriculture Organization of the United Nations**.

Bio fortified foodgrains:

- **Biofortification** is the idea of **breeding crops to increase their nutritional value**. This can be done either through **conventional selective breeding, or through genetic engineering**.
- **Biofortification differs from ordinary fortification** because it focuses on making plant foods more nutritious as the plants are growing, rather than having nutrients added to the foods when they are being processed.
- Biofortification is seen as an **upcoming strategy for dealing with deficiencies of micronutrients in low and middle-income countries**.
- In the case of **iron**, the **WHO** estimated that **biofortification could help curing the 2 billion people suffering from iron deficiency-induced anemia**. **Bio fortified rice** is the most low cost, intensive and affordable way to address the nutrition challenge. **Bio fortified rice** can be produced in bulk and it is not cost intensive.

Topic 69. INDIA AGEING, ELDERLY TO MAKE UP 20% OF POPULATION BY 2050: UNFPA REPORT

Important for the subject: Geography

The **United Nations Report** has said that by **2046** it is likely that **elderly population will have surpassed the population of children (aged 0 to 15 years) in the country.**

Report title: India Ageing Report 2023

- Published by: **United Nations Population Fund, India (UNFPA)**
- The report used data from the **2011 Census**, the **2017-18 Longitudinal Ageing Survey in India (LASI)** conducted by the **Health Ministry**, population projections of the Government of India and the World Population Projection 2022 report, among other sources.

Decadal growth rate of the elderly population of India is 41%.

- The **percentage of elderly population** in the country is projected to **double** to over **20%** of total population by **2050**.

Key findings of the report:

Over 40% poorest:

- More than **40%** of the elderly in India are in the poorest wealth quintile, with about **18.7% of them living without an income**. This may affect their quality of life and healthcare utilization.
- The population of people **aged 80+ years** will grow at a rate of around **279%** between **2022 and 2050** with a “**predominance of widowed and highly dependent very old women**” – a finding in line with the pattern across several nations.
- **Women had higher life expectancy** at the age of **60** and at the **80** compared to **men** — with variations across States and Union Territories.

Higher life expectancy:

- **Life expectancy of women at 60 years** is greater than **20 years** in States such as Rajasthan, Haryana, Gujarat, Uttarakhand, Kerala, Himachal Pradesh, and the Union Territory of Jammu & Kashmir, raising concerns about their social and economic well-being.
- The **sex ratio (females per 1,000 males) among the elderly has been climbing steadily since 1991**, with the ratio in the general population stagnating.
- Between 2011 and 2021, the **ratio increased in India as a whole and across all regions**, barring the **Union Territories and western India**.
- In the **northeast and the east**, while the **sex ratio** of the elderly increased, it remained below 1,000 in both years.

- In central India the sex ratio went from **973 in 2011** to **1,053 in 2021**. Life expectancy at 60 years differentiated by gender across states.

Inherently gendered:

- **Poverty** is inherently **gendered in old age** when **older women** are more likely to be **widowed, living alone, with no income** and with fewer assets of their own, and fully dependent on family for support.
- Major challenges include the **feminisation** and **ruralisation** of this older population.
- Most States in the **southern region** and select **northern States** such as **Himachal Pradesh and Punjab** reported a **higher share of the elderly population than the national average in 2021**, a gap that is expected to widen by 2036.

Projected share of the elderly population:

- While States reporting **higher fertility rates** and **lagging in demographic transition**, including **Bihar and Uttar Pradesh**, expect to see an increase in the share of the elderly population between 2021 and 2036, the level will remain lower than the Indian average.
- Compared with **southern and western India**, **central and northeastern regions** have the **younger group of States** as indicated by the aging index.

Old-age dependency ratio across states:

- In the **southern region**, the **old-age dependency ratio** (elderly people per 100 people between 15 and 59 years) was **higher than the national average** at around **20** as is true of **western India at 17**. Overall, **Union**
- **Territories (13)** and the **north-eastern region (13)** reflected **lower old age dependency ratios**.

Government aid to elderly populations:

- While most said they received state aid, this was not enough; that there were no accessible public healthcare facilities; and that nobody except NGOs or CBOs (community-based organisations) helped them.

Topic 70. MS SWAMINATHAN'S EVERGREEN REVOLUTION: PRODUCTIVITY WITHOUT ECOLOGICAL HARM

Important for the subject: Geography

The legendary **agricultural scientist M.S. Swaminathan** passed away on September 28 after turning 98 on August 7. He was known as the **father of the Green Revolution in India**.

About M. S. Swaminathan (7 August 1925 – 28 September 2023):

- In **1954** he joined the **Indian Agricultural Research Institute (IARI)** at **New Delhi** as an **assistant cytogeneticist**.

- He worked on **potato genetics and breeding of frost- and disease-resistant varieties**. He was an **Indian agronomist, agricultural scientist, plant geneticist, administrator, and humanitarian**.
- Swaminathan's collaborative scientific efforts with **Norman Borlaug** saved **India and Pakistan from certain famine-like conditions in the 1960s**.
- His leadership as **director general of the International Rice Research Institute (IRRI) in the Philippines** was instrumental in his being awarded the **first World Food Prize in 1987**, recognized as **one of the highest honors in the field of agriculture**.
- The **United Nations Environment Programme** has called him "**the Father of Economic Ecology**".

Development of semi-dwarf variety of wheat:

- Traditional wheat varieties were tall and slender. Their plants grew to 4.5-5 feet height with long and weak stems. They "lodged" or bent over, even falling flat on the ground.
- He wanted to develop a **non-lodging variety** which could "tolerate" higher fertilizer doses.
- **Mutagenesis**— A process of exposing plants to radiation to introduce desirable modifications in their DNA.
- **Norin-10 (a semi-dwarf wheat variety from Japan)** was cross-pollinated with locally-grown US wheat resulting in the wheat variety named '**Gaines**'.
- **Norin-10**, when crossed with the **spring wheats grown in Mexico, resulting in high-yielding varieties** incorporating the **dwarfing genes of Norin-10** in a spring wheat background — **Sonara 63, Sonora 64, Mayo 64 and Lerma Rojo 64A** — were better suited for cultivation in India.
- These **Mexican wheat varieties** were cultivated in India that led to the success of the green revolution.
- Indian scientists later bred their own **Kalyansona and Sonalika wheat varieties**. These produced **amber-coloured grain** with **better chapati-making quality** than the imported red wheats.
- **Key scientific terms associated with Dr. M.S. Swaminathan's research and Green Revolution**

Green Revolution:

- A period of rapid, scientific agricultural advancement in the mid-1960s that involved growing a high-yielding, disease-resistant variety of wheat, primarily in Punjab, was the beginning of **India's Green Revolution**.
- **Key architect:** Dr. Swaminathan, former Union Agriculture Ministers C. Subramaniam (1964-67) and Jagjivan Ram (1967-70 and 1974-77).
- **Short-straw or dwarf varieties of crops** like rice and wheat formed the basis of India's Green Revolution. **Dwarf strains** have a **higher Harvest Index**, which means that the plant puts more of its energy resources into **seeds** rather than **leaves or other plant structures**.

- Harvest Index quantifies the crop yield in comparison to the total biomass produced.

HYV crops:

- High-yielding varieties of crops, or HYVs, produced a higher yield of crop per hectare in comparison to traditional variants. HYVs are usually disease-resistant and have a higher tolerance to conditions like drought.
- **IR8**, a variety of rice developed by the **International Rice Research Institute (IRRI)** and first introduced in the **Philippines**, could produce as much as **seven tonnes of rice per hectare**.

Yield gap:

- The difference between the potential or maximum achievable yield of a crop and the actual realised yield for a given area is called the yield gap.

Cytogenetics:

- Cytogenetics is the **study of chromosomes (DNA-carrying structures) and how they relate to hereditary characteristics and traits**. Identifying traits such as resistance to diseases, drought, and pests in crops are applications of cytogenetics.

Hexaploid wheat:

- Scientifically known as **Triticum aestivum**, **hexaploid wheat** contains **six sets of chromosomes** and is among the **most widely cultivated cereal crops across the world**. It is also called "**bread wheat**". Dr. Swaminathan is associated with research on the cytogenetics of hexaploid wheat.

Carbon fixation:

- **Carbon fixation** is the process by which **crops capture carbon dioxide** from the atmosphere and convert it into organic compounds like sugars and starches, mostly through photosynthesis.
- **Grass species either use C3 or C4 classes of photosynthetic pathways** for carbon fixation. The **C3 pathway**, also called the **Calvin cycle**, is slower in comparison to **C4** – also called the **Hatch and Slack pathway**.
- **C4** occurs in both **mesophyll cells** and **bundle sheath cells**, making **photosynthesis more efficient**. Research on the **C4 rice plant** was started at the **IRRI** when **Dr. Swaminathan** was the **Director General of the organization**.

Evergreen revolution

- The phrase "evergreen revolution" refers to long-term productivity growth that is not unhealthy to the environment or society. The Evergreen Revolution entails incorporating ecological principles into the development and dissemination of technology

Topic 71. NARMADA FLOODS: CONGRESS DEMANDS SIT PROBE, HIGHER COMPENSATION

Important for the subject : Geography

Calling the flood like situation in parts of Narmada, Bharuch and Vadodara districts a “manmade Calamity”

Narmada:

- The Narmada, the **largest west flowing river of the Peninsula**, rises near **Amarkantak** range of mountains in **Madhya Pradesh**.
- It is the **fifth largest river in the country** and the **largest one in Gujarat**. It traverses **Madhya Pradesh, Maharashtra and Gujarat** and meets the **Gulf of Cambay**.

Topic 72. TOTO SHABDA SANGRAHA

Important for the subject :Geography

A language spoken by barely 1,600 people living in parts of West Bengal bordering Bhutan is to get a dictionary, thanks to the efforts of a professor at the University of Calcutta.

What is Toto language?

- Toto is a **Sino-Tibetan language spoken by the Toto tribal people**, primarily in parts of **West Bengal bordering Bhutan**.
- Toto is traditionally a spoken language, and although a **script was developed in 2015 by Dhaniram Toto**, many Toto people still write in the Bengali script.

Endangered Status

- Toto is considered a critically endangered language by UNESCO, with an estimated 1,000 speakers or fewer.
- Despite this endangered status, many families within the Toto community still use the language at home. It is often the primary language children learn at home, although they use Bengali when attending school.
- **Language Preservation Efforts:** Researchers and members of the Toto community are aware of the endangered status of the language. The influence of other languages, particularly Nepali and Bengali, is increasing, posing a threat to Toto.
- Efforts are being made to document and preserve the language, including the Himalayan Languages Project’s work on creating the first grammatical sketch of Toto.

Topic 73. PINK BOLLWORM IS WREAKING HAVOC ON COTTON FIELDS

Important for the subject : Geography

Pink ballworm has caused widespread damage in Haryana and Punjab Pink ballworm

(PBW):

It is one of the most destructive pests of cotton. **Distribution:** Originally native to India, it is now recorded in nearly all the cotton-growing countries of the world.

Features

- The adults are small moths about 3/8 inch long and are dark brown with markings on the fore wing.
- The larval stage is the destructive and identifiable stage. The larvae have distinctive pink bands and can reach a length of 1/2 inches right before they pupate.

Ecological Threat:

- Adults lay eggs on cotton bolls; once hatched, the larvae eat the seeds and damage the fibers of the cotton, reducing the yield and quality.
- When the larvae mature, they cut out the boll and drop to the ground and cocoon near the soil surface.
- It has also been observed to attack hibiscus, okra, and hollyhock plants.
- The PBW larvae burrow into the developing fruits (bolls) of cotton plants, and the damage affects both the weight and quality of the harvested bolls containing the lint fibre and seeds inside.

Symptoms of Damage

- Rosetted flowers. Excreta observed at the point of bore holes by larval feeding. . Interlocular boring and formation of double seeds.
- The attacked buds and immature bolls drop off. Discoloured lint and burrowed seeds.

Cotton

- Cotton is the most important commercial crop of our country contributing upto 75% of total raw material needs of textile industry and provides employment to about 60 million people.
- India has **the largest area under cotton cultivation with relatively low productivity primarily** due to the large area under rainfed cultivation with inadequate supply of inputs.
- Area wise, India ranks first in world, whereas, it ranks second in production next to China.
- Only in India, **all the four spinnable fibre yielding species of Gossypium viz., Gossypium hirsutum, G. barbadense, G. arboreum and G. herbaceum** are cultivated commercially.
- Hybrid cotton cultivation in about 45% of total cotton area contributing 55% of production is a significant milestone achievement in Indian Cotton scenario.
- Cotton is attacked by several insect pests reducing the crop yield to a greater extent.
- The insect pests that attack cotton crop may be classified into sap sucking insects (Aphids, Jassids and White fly) or chewing insects (Bollworms, leaf eating caterpillars etc.)Of the total pesticides used in Indian Agriculture, about 45 per cent is sprayed on cotton crop

alone.

- To reduce pesticide usage in cotton, several strategies like use of Genetic Resistance to insect pests, Integrated Pest Management (IPM), Insecticide Resistance Management (IRM) etc. are advocated.
- In recent times, Bt cotton technology is found to be one of the best strategies to manage bollworms, the most important pest of cotton.

The Need for Bt cotton

- The genetic resistance, one of the important pest management strategy, is available in cotton gene pool against the sap sucking pests such as jassids, whitefly etc and using this several resistant / tolerant varieties and hybrids have been developed and released in India.
- However, such kind of known resistance is not available against the bollworms. Hence, an alternate strategy is explored to circumvent this problem by cloning and transferring the genes encoding the toxic crystal δ – endo toxin protein from the soil bacterium *Bacillus thuringiensis*.
- **The Bt transgenic cotton (Bollgard of Monsanto)** has thus been developed successfully in USA, which has the ability to control the bollworms at the early stages of crop growth (upto 90 days) effectively.
- The first commercial Bt cotton variety was released in USA by M/S. Monsanto (Bollgard), which contains Cry 1Ac gene of *Bacillus thuringiensis*. Bt cotton is commercially grown in several countries like China, Australia, Mexico, South Africa, Argentina, India, Indonesia etc.
- World wide the area under Bt cotton keep increasing year by year. Overall, about 12% of the world cotton is now planted with Genetically Modified varieties / hybrids (GMO) and ICAC has estimated that his may rise to 50 % in 5-7 years.

Topic 74. DPDP ACT: THE GRIEVANCE REDRESSAL PROCESS

Important for the subject : Polity

Data fiduciaries have certain obligations towards the **data principals** including access to a **grievance redressal mechanis**.

The recently enacted **Digital Personal Data Protection Act, 2023 (DPDP Act)** has an inbuilt multilayered mechanism for addressing grievances.

According to the Act, **while requesting for consent**, a data fiduciary **must provide data principals** with specific information that includes a reference to this **right of grievance redressal**, as well as a description of how to make a complaint to the

Data Protection Board of India (DPBI).

- The DPBI will have the **powers of a civil court** involving government-appointed Important for the subject-matter experts under the auspices of a **‘digital office’**
- A data fiduciary is required to protect the personal data in its possession (including data

processed by a third party on its behalf) by taking reasonable security safeguards to prevent unauthorised processing, accidental disclosures and other incidents that may constitute a breach.

The redressal system:

- If and when a breach occurs, the data fiduciary needs to **inform the DPBI and each affected data principal** about it, *even if* the breach is a minor one or relates to **non-sensitive data**.
- After receiving such intimation, the DPBI may direct urgent remedial or mitigation measures, as well as inquire into the breach and impose penalties.
- The data principals may also make a separate complaint to the DPBI about data breaches or non-performance of obligations.
- While the data fiduciary must respond to grievances within a stipulated period, **data principals need to exhaust all avenues of redressal before approaching the DPBI**.
- Once the case reaches the DPBI, it gives an entity the opportunity of being heard after which the Board may issue binding directions.
- In parallel, the DPBI will also decide if there are sufficient grounds to warrant an inquiry before closing or continuing with such proceedings. If yes, the DPBI will examine the affairs of the entity based on **principles of natural justice**.
- In each step, the DPBI will maintain a record of written and reasoned findings. Interim orders may be issued during this process. After giving the entity another chance to defend itself, a monetary penalty, going up to **₹250 crore** for each breach, with no aggregate cap, may be imposed.
- If one is aggrieved by the order/direction from the DPBI itself, an appeal may be filed within 60 days before the **Telecom Disputes Settlement and**
- **Appellate Tribunal (TDSAT)** — the decision of which is further appealable before the **Supreme Court**. Like the DPBI, the TDSAT is intended to function as a digital office, bearing the powers of a civil court

Terms

- “**Data Fiduciary**” means any person who alone or in conjunction with other persons determines the purpose and means of processing of personal data.
- They are entities which determine the purpose and means of processing personal information, “**Data Principal**” means the individual to whom the personal data relates.
- “**Digital office**” means an office that adopts an online mechanism wherein the proceedings, from receipt of intimation or complaint or reference or directions or appeal, as the case may be, to the disposal thereof, are conducted in online or digital mode;

Topic 75. 70 COLLEGIUM PROPOSALS PENDING, SUPREME COURT SAYS WILL MONITOR

Important for the subject :Polity

The Supreme Court bench was hearing a plea by the **Bengaluru Advocates Association** seeking **contempt of court proceedings** against the government for alleged delay in the appointment of judges.

The Supreme Court is concerned about the **delay in appointing and transferring High Court judges**.

- The Court has noted that **70 recommendations from the Collegium are still pending with the government**.
- It plans to **closely monitor this issue** and will **review it every 10-12 days** until resolved

What is the collegium system:

- The **ruling in the Third Judges Case**, gave **legal backing** to the **current system of appointment of judges and created the collegium of the CJI and four senior-most judges**.
- The **principal objective of the collegium is to ensure that the best available talent is brought to the Supreme Court Bench**.
- The collegium system is **not rooted in the Constitution** or a specific law promulgated by Parliament.
- The SC collegium is **headed by the incumbent CJI and comprises the four other senior most judges of the court at that time**.

What the Constitution says:-

- **Articles 124(2) and 217** of the Constitution deal with the appointment of judges to the Supreme Court and High Courts.
- The **appointments are made by the President**, who is required to **hold “consultations” with “such of the judges of the Supreme Court and of the High Courts” as he may think is needed**.
- For appointments other than the Chief Justice, “the Chief Justice of India shall always be consulted”.

Evolution of the system

- The collegium system evolved out of a series of judgments of the Supreme Court that are called the “**Judges Cases**”.

FIRST JUDGES CASE:

- In **SP Gupta vs Union of India, 1981**, the Supreme Court held that the **concept of primacy of the CJI was not really rooted in the Constitution**.
- The Constitution Bench also held that the **term “consultation”** used in Articles 124 and 217 **did not mean “concurrence”**. Therefore though the **President** will consult these functionaries, his **decision doesn’t have to concur with them**. This judgment **tilted the balance of power in favour of the executive**.

SECOND JUDGES CASE:

- In **The Supreme Court Advocates-on-Record Association vs Union of India, 1993**, a **nine-judge Constitution Bench** overturned the decision in **SP Gupta**, and devised a specific procedure called the **‘Collegium System’**.
- The verdict in the case **accorded primacy to the CJI in appointment and transfers**, and ruled that the **term “consultation” would not diminish the primary role of the CJI**.
- The verdict said that the **recommendation should be made by the CJI in consultation with his two senior most colleagues**.
- It added that **although the executive could ask the collegium to reconsider the matter, if the collegium reiterated the recommendation, the executive was bound to make the appointment**.

THIRD JUDGES CASE:

- In **1998**, then **President K R Narayanan** issued a **Presidential Reference to the Supreme Court under Article 143 of the Constitution** over the meaning of the term **“consultation”**.
- The question was whether **“consultation”** required consultation with a number of judges in forming the CJI’s opinion, or whether the sole opinion of CJI could by itself constitute a **“consultation”**.
- In response, the **SC laid down nine guidelines which has come to be the existing form of the collegium**. The SC laid down that the **recommendation should be made by the CJI and his four seniormost colleagues instead of two**.
- It was also held that **even if two judges gave an adverse opinion, the CJI should not send the recommendation to the government**.

Topic 76. LAW PANEL READY REPORTS ON SIMULTANEOUS POLL

Important for the subject :Polity

The Law Commission of India is set to submit a report recommending simultaneous elections in the country.

The Law Commission of India is preparing to **submit a report advocating simultaneous elections in the country**, possibly with tentative timelines for the **2024 and 2029 election cycles**.

- The report is **one of three from the 22nd Law Commission**, with the others focusing on

the **minimum age of consent in the Protection of Children from Sexual Offences (POCSO) Act and proposing a law for online filing of First**

Information Reports (FIRs).

- A high-level committee led by **former President Ram Nath Kovind is already examining simultaneous elections**, citing national interest, and has sought input from the Law Commission and political parties.
- In **2018, the 21st Law Commission** also recommended the **‘One Nation, One Election’ concept** but suggested further discussion and examination before final recommendations.
- The **22nd Law Commission** was established in February 2020 and had its **term extended to August 31, 2024, with Justice Ritu Raj Awasthi as its chairperson**, appointed in November 2022.

What is Simultaneous election:

- The concept of **“One Nation, One Election”** envisions a system in **which all state and Lok Sabha elections must be held simultaneously.**
- This will **entail restructuring the Indian election cycle** so that **elections to the states and the center coincide.**
- This would imply that **voters will vote for members of the LS and state assemblies on the same day and at the same time.**

What is the history holding of Simultaneous Election in India:

- Simultaneous elections have previously been **conducted in India in 1952, 1957, 1962 and 1967.**
- Soon after, this norm was discontinued following the **dissolution of some Legislative Assemblies between 1968 -69.**
- Since then, the **Indian Electoral system holds polls to Centre and states separately.**

What are the Constitutional challenges involved:

- The **Indian Constitution** provides for the **dissolution of the legislature** if the **ruling party loses majority by passing a vote of no confidence.**
- **Clause (2) of Article 83, Article 172(1)** of Indian constitution **deals with the term of Lok Sabha and State Assemblies** respectively.
- Through **Articles 85(2)(b) and 174(2)(b)** these Houses **can be dissolved ahead of the scheduled expiry of the term of five years**
- However, **there is no provision for extension of the term** unless a **proclamation of Emergency is in operation.**
- **Bringing the terms of all the Houses to sync** with one another necessarily **calls for either extending the terms of several of the Houses or curtailing of terms or a combination of both**, that too by two to three years in some cases.
- In such a case, simultaneous elections could **not be held within the existing framework**

of the Constitution.

These could be held together through appropriate amendments to:

- **The Constitution, The Representation of the People Act 1951, and The Rules of Procedure of Lok Sabha and state Assemblies.**
- **Since it will affect federal character, at least 50% of the states will require to ratify the constitutional amendments.**

Some facts about Law Commission of India:

- Law Commission of India is **neither a constitutional body nor a statutory body**, it is **an executive body** established by an order of the Government of India.
- The Commission is established for a **fixed tenure** and works as an **advisory body to the Ministry of Law and Justice**. Its membership **primarily comprises legal experts**. It plays a crucial role in legal reforms and the development of the Indian legal system.
- The **first Law Commission was established in 1955**, and since then, there have been several subsequent commissions. The Law Commission operates **under the Law Commission Act, 1956**.
- **Composition:** The Commission consists of a **chairman, who is typically a retired judge of the Supreme Court of India or a retired Chief Justice of a High Court, and other members, including legal experts and scholars**.
- **Role and Functions:** The primary function of the Law Commission is to **examine and review the existing laws of the country**, suggest reforms, and make recommendations for new legislation. It also conducts research, studies, and consultations on various legal issues referred to it by the government.
- The Commission conducts in-depth research on legal matters, examines specific. Important for the subjects, and prepares detailed reports with recommendations for legal reforms.
- These reports cover a wide range of topics, including civil and criminal laws, family laws, constitutional law, administrative law, and other legal areas.

Topic 77. COPYRIGHT INFRINGEMENT AND WHEN DOES IT APPLY

Important for the subject :Polity

The Delhi High Court has issued summons to an Instagram account called People of India , in a copyright infringement suit filed by the storytelling platform Humans of Bombay.

What is Copyright and its Infringement:

- “Copyright” refers to the **right given by the law to creators of literary, dramatic, musical, and artistic works and producers of cinematograph films and sound recordings**.
- It is a **bundle of rights** that includes **rights of reproduction, communication to the public, adaptation, and translation of a work**. The **Copyright Act 1957** aims to

safeguard creative works, which are considered to be the creator's intellectual property (IP).

- A copyrighted work will be considered “infringed” only if a substantial part is made use of without authorisation.
- In cases of infringement, the copyright owner can take legal action against any person who infringes on or violates their copyright and is entitled to remedies such as injunctions, damages, etc.

What is Passing Off:

- Passing-off is a form of **unfair trade competition**, involving **one party trying to gain from another's established reputation** in a trade or business through **deception**.
- To assert a ‘passing off’ claim, **evidence of deception, misrepresentation, or harm to the mark owner's goodwill and reputation is essential**.
- **For e.g** If a **brand logo is intentionally altered** in a way that's not immediately noticeable to consumers, it doesn't require identical products for infringement. Instead, it hinges on proving similarity in the rival traders' goods, as established in the **Cadila Healthcare vs. Cadila Pharmaceuticals (2001)** case.

What is Intellectual Property (IP):

- IP refers to **creations of the mind, such as inventions, literary and artistic works, designs and symbols, names and images** used in commerce.
- IP is **protected in law** enabling people to earn recognition or financial benefit from what they invent or create.
- By striking the right balance between the interests of innovators and the wider public interest, the IP system aims to foster an environment in which creativity and innovation can flourish.

What are the different types of Intellectual Property (IP):

- **Copyright, Patents, Trademarks, Industrial designs, Geographical indications (GI) and Trade secrets.**

What are various Governing regulations:

- The **Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)** is an international legal agreement, which establishes **minimum standards for the regulation by national governments of different forms of IP**.
- **IP rights in India** are governed under the **The Trade Marks Act 1999, The Patents Act 1970 (amended in 2005), The Copyright Act 1957, The Designs Act 2000, The GI of Goods (Registration and Protection) Act 1999**, etc.

Topic 78. MHA EXTEND DISTURB AREA STATUS IN ARUNACHAL AND NAGALAND BY 6 MONTHS

Important for the subject :Polity

The Union Home Ministry has extended the disturbed area status in **parts of Arunachal Pradesh and Nagaland** under the Armed Forces (Special Powers) Act, 1958 for another six months

The Union Home Ministry extended for **another six months** the disturbed area status in parts of Arunachal Pradesh and Nagaland under the Armed Forces (Special Powers) Act, 1958.

- According to two separate notifications, the decisions have been taken after review of the law-and-order situation in both the states.

What is Armed Forces (Special Powers) Act, 1958.

- Armed Forces (Special Powers) Act (AFSPA), 1958 is an act of India that **grants special powers to the Indian Armed Forces** to maintain public order in “disturbed areas”.
- The **Central Government, or the Governor of the State or administrator of the Union Territory can declare the whole or part of the State or Union Territory as a disturbed area.**
- The Act in its **original form was promulgated by the British** in response to the **Quit India Movement in 1942.** It was then titled the **Armed Forces (Special Powers) Ordinance, 1942.**
- After Independence, Prime Minister Jawaharlal Nehru decided to retain the Act, which was **first brought in as an ordinance and then notified as an Act in 1958.**

What are different Provisions of AFSPA,1958:

- Under **Section 3**, the **Central Government or the Governor of the State or administrator of the Union Territory can declare the whole or part of the State or Union Territory as a disturbed area.**
- An area can be disturbed due to differences or disputes between members of different religious, racial, language or regional groups or castes or communities.
- **Section 4** gives the **Army powers to search premises and make arrests without warrants**, to use force even to the extent of causing death, destroy arms/ammunition dumps, fortifications/shelters/hideouts and to stop, search and seize any vehicle.
- **Section 6** stipulates that **arrested persons and the seized property are to be made over to the police with the least possible delay.**
- **Section 7** offers **protection of persons acting in good faith** in their official capacity. The prosecution is **permitted only after the sanction of the Central Government.**

What is the current status of AFSPA

- **Assam was the first state to come under the AFSPA in 1958.**
- Currently, AFSPA is in place in the **entire UT of Jammu & Kashmir, eight districts of Assam, certain areas of Manipur, Arunachal Pradesh & Nagaland.**

What are the recommendations of various committees on AFSPA:

- In **November 2004**, the Central government established a **five-member committee led by Justice B P Jeevan Reddy** to assess the provisions of the act in the northeastern states.
- The committee proposed the **repeal of AFSPA and suggested incorporating suitable provisions into the Unlawful Activities (Prevention) Act, 1967.**
- Additionally, the **5th report of the Second Administrative Reforms Commission (ARC)** on public order recommended **AFSPA's repeal.**
- Conversely, the **Supreme Court affirmed AFSPA's constitutionality in the Naga People's Movement of Human Rights v. Union of India case (1998).**

Topic 79. CHINESE RESEARCH SHIP TO VISIT SRI LANKA

Important for the subject :Polity

A Chinese research ship is going to dock on Sri Lanka's Colombo port in October. A vessel named '**Shi Yan 6**', a scientific research vessel, with a 60-member crew, is going to land on Sri Lankan port.

- The research ship aims to **carry out oceanography, marine geology and marine ecology tests.**
- The Chinese research vessel is expected in the island country in **October** to carry out research along with **Sri Lanka's National Aquatic Resources Research and Development Agency (NARA)**

What happened last year:

- India expressed concerns over a **Chinese ballistic missile and satellite tracking ship, Yuan Wang 5**, docking at Sri Lanka's **Hambantota port** for a week.
- Initially, **Sri Lanka postponed** the ship's arrival due to Indian objections but later **allowed it.**
- India feared the ship's surveillance range could cover several Indian ports, potentially compromising security. China argued that the ship's activities were lawful and non-threatening. This incident strained India-Sri Lanka relations, reminiscent of a previous controversy when Sri Lanka permitted a Chinese nuclear-powered submarine to dock in 2014.

Some facts about Hambantota Port:

- Hambantota port is located **right in the middle of vital energy supply lines** in the Indian Ocean, connecting the Middle East and East Asia.
- Hambantota port is a **deep-water port** in the **southern tip of Sri Lanka**

International Port Group is a **Public Private Partnership and a Strategic Development Project between the Government of Sri Lanka and China Merchants Port Holdings (CMPort).**

- This port was **given to China by Sri Lanka on a 99-year** lease after Sri Lanka failed to repay Chinese loans.

Topic 80. PRACHAND SAY NO TO CHINESE SECURITY DOCTRINE

Important for the subject :Polity

Nepal says ‘no’ to China’s Global Security Initiative.

Nepal, during Prime Minister Pushpa Kamal Dahal Prachanda’s visit to Beijing, declined to join **China’s Global Security Initiative (GSI)** but agreed to **advance cross-border connectivity projects.**

The joint statement emphasized **support for China’s Global Development Initiative (GDI) and the Belt and Road Initiative (BRI).**

- While Nepal **refrained from endorsing GSI**, it showed willingness for some security cooperation, such as **joint boundary inspections and law enforcement collaboration.**
- Both nations also highlighted various infrastructure projects, including a **crossborder railway from Lhasa to Kathmandu.** This indicates Nepal’s intent to collaborate on development but remain cautious regarding security cooperation with China.
- The Nepali supports the **Global Development Initiative (GDI)** proposed by China, and will consider to join the **Group of Friends of the GDI**
- Additionally, Nepal **gifted China unicorn rhinos** as a symbol of friendship.

What is Global Security Initiative (GSI):

- The Global Security Initiative (GSI), a **China-led framework aiming to restore stability and security in Asia**, appears to be more of a counter-narrative to U.S. leadership rather than a genuine attempt to establish a sustainable security order.
- It was stated that the **five major pillars** to implement GSI would be:

Mutual respect Openness and inclusion Multilateralism Mutual benefit Holistic approach

What are the key principles of Global Security Initiative (GSI):

- China held that the Global security initiative is **envisaged to uphold the principle of “indivisible security”**. The principle of “indivisible security” means that **no country can strengthen its own security at the expense of others.**
- This initiative would build an **Asian security model** of mutual respect, openness and integration.
- It would oppose the destruction of the international order under the banner of so-called rules.

- It will also **oppose the dragging of the world** under the cloud of the new cold war.
- This initiative will **oppose the use of the Indo-Pacific strategy** to divide the region and create a new Cold War, and the use of military alliances to put together an Asian version of NATO.

Global Development Initiative (GDI)

- **The Global Development Initiative** is a global initiative proposed by China in 2021. It is regarded as another important public good and cooperation platform provided by China to the world.
- President Xi talked about eight priority areas for cooperation: (i) poverty alleviation, (ii) food security, (iii) COVID-19 and vaccines, (iv) financing for development, (v) climate change and green development, (vi) industrialisation, (vii) digital economy, and (viii) connectivity.
- Group of Friends aims to seek greater complementarity between the GDI and the 2030.
- Agenda, support UN work in the field of development, and help developing countries fight the pandemic and implement the 2030 Agenda.

Topic 81. DEPARTMENT OF FISHERIES IS PROMOTING ARTIFICIAL REEF (AR) UNDER PMMSY FOR REJUVENATING COASTAL FISHERIES

Important for the subject : Schemes

To promote sustainable practices, **Department of Fisheries** has sanctioned **732 artificial reef units** for **10 coastal states** with a total investment of **Rs 126 crore** as a sub-activity under “**Integrated Modern Coastal Fishing Villages**” of the Centrally Sponsored Scheme (CSS) of **Pradhan Mantri Matsya Sampada Yojana (PMMSY)**.

- The projects are being implemented with the technical support of **Fishery Survey of India (FSI)** and **ICAR-Central Marine Fisheries Research Institute (CMFRI)**.

Artificial reefs:

- **Artificial reefs** are **engineering technology interventions** used to rehabilitate and/or improve **natural habitats, increase productivity and manage aquatic resources** including **habitat enhancement (FAO, 2015)**. Installation of artificial reefs is advantageous in many forms as below:
- Similar to natural reefs, **ARs** are used for aggregating fish and provide a home for fish to live and grow, reduce wave damage on coasts, help regeneration of marine ecosystems and act as a **carbon sink**. As per **CMFRI**, two to threefold increase in catch rates and efficiency can be realized. Thus saving fuel and energy costs leading to increased income.
- Provide a firm substrate for marine life such as corals, algae and plankton to attach to and grow. They provide favorable conditions for sea ranching and serve as spawning and nursery grounds for fish.
- Enhance recreational fisheries, snorkeling, eco-tourism, creating suitable areas for diving and reducing conflicts.

- Artificial reef structures restrict bottom trawling in the near shore areas thus helping the marine environment to regenerate and small-scale fishers get higher catch
- One artificial reef of 300m³ is expected to support 25-30 non-mechanized boats (CMFRI).

About PMMSY:

- Launched in May **2020** with the investment of **Rs. 20,050 crore**.
- **Aim:** To bring about the **Blue Revolution** through sustainable and responsible development of the fisheries sector.
- Over the years, increased fishing activities has reduced per capita yield from coastal fisheries, to led to heavy fishing pressure, loss of fishing grounds due to bottom trawling, coastal development etc.
- This has also resulted in reduced income and forcing the fishers to go to deeper waters.