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6/6/2017 Civil Services Marksheet
Current Time & Date : 09:28:25 AM (Tue, 6th Jun, 2017)

**UNION PUBLIC SERVICE COMMISSION
MARKSHEET**

Civil Services (PRELIMINARY) Examination , 2016	
Roll Number	0029983
Name	SANTOSH PANDEY
Marks Obtained	
Paper I	144.66
Paper II	107.50

REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION, 2016

DISCLAIMER : The contents of this site is informative in nature. You are advised to verify the same from Commission's office.

SANTOSH SIR

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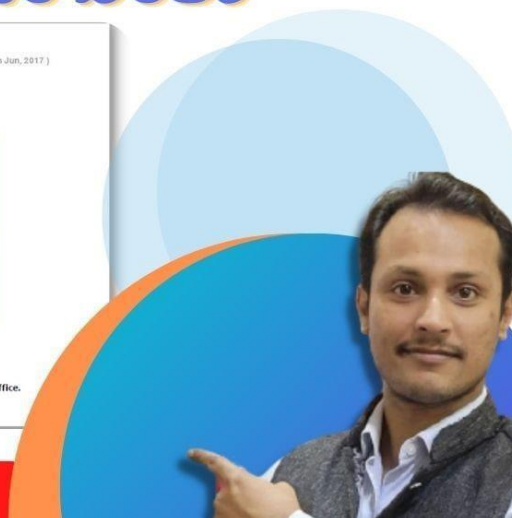


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TEST BASED MENTORSHIP FOR CSE PRELIMS 2023

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- 🔸 ENTIRE YEAR IMP QUESTION TEST (SUBJECT-WISE) - 8
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HISTORY

1. Patna: a fading city once loved by age-old rulers and travelers:

History of Patna:

- The **original name of Patna was Pataliputra or Patalipattan.**
- The **name Patna has undergone many changes** at its earliest stages like **Pataligram, Kusumpur, Patliputra, Azimabad** etc., ultimately terminating to the present one.
- It has been said that **Pataliputra was founded by Ajatashatru**
- **Chandragupta Maurya** made it his **capital in the 4th century B.C.**
- There existed a village named **Pattan or Patthan, which later turned into Patna.**
- The ancient village was named **‘Patali’ and the word ‘Pattan’ was added to it.**
- Greek history mentions **‘Palibothra’ which perhaps is Pataliputra** itself.
- **Aurangzeb** who briefly named it **Azimabad** after his **grandson Mohammed Azim**
- **Prince Azim-us-Shan, the grandson of Aurangzeb** came as the **Governor of Patna in 1703**
- For people following the Sikh religion, Patna is a sacred city as the tenth Sikh guru, **Guru Gobind Singh, was born here.**

Patna a favourite place of travellers

- This city was the **fountainhead of the spring of knowledge** and wisdom in ancient times
- Greek ambassador **Megasthenes** stayed in **Patliputra** during the **reign of Chandragupta Maurya.**
- The famous traveler **Fa-Hien in the 3rd century and Hiuen-Tsang in the 7th century** inspected the city.
- FaHien wrote about it in A Record of Buddhist Kingdoms wherein he called Patna, ‘the city of flowers’,
- Many noted scholars like **Kautilya** stayed here and works like **‘Arthashastra’** were written from this place.
- British traveler **Ralph Fitch** came to **Patna in 1586** and described it as “a very long and great town with a flourishing trade in cotton, sugar and opium”.
- **Scottish** physician **Francis Buchanan** described it in unflattering expression, **“difficult to imagine a more disgusting place”.**
- **E.M. Forster** who made **Bankipore** a residential area within Patna the model for **Chandrapore**, the fictional town in **A Passage of India**
- Patna also got a fleeting reference in **Jhumpa Lahiri’s** novel **The Namesake.**

2. First Sylhet-Silchar Festival

Context: The first Sylhet-Silchar Festival celebrating the close cultural ties between the neighbouring regions of India and Bangladesh began in Assam’s Barak Valley on Friday.

Content:

- The festival **underlines the commonalities** between India and Bangladesh, **specifically the Sylheti variant of the Bengali language and the Sylheti culture.**
- The festival, which **aims at boosting bilateral relations** between the two nations, is being **organised by India Foundation under the aegis of the Union Ministry of Culture in association with the Bangladesh Foundation for Regional Studies.**
- The festival will **bring together eminent people** from both sides to **discuss issues of mutual interest** and it can showcase opportunities in the **healthcare, tourism and education sectors.**
- The event will **commemorate 75 years of India’s Independence** and **50th anniversary of Bangladesh’s liberation from Pakistan.**
- The event will **showcase the cuisine, arts, crafts, culture and local produce** which will further **strengthen people-to-people connect** between the two regions.

3. Caves from the ruins of Kaushambi

Concept:

Pabhosha hill

- The Pabhosha hill is the solitary rocky island which is north of the **Yamuna River.**
- It was said to have the Kaushambi remains of an artificial cave created in the second century BCE.
- It has an epigraph along with a stone bed and pillow which is similar to what one sees in the Bandhavgarh caves.

Bhita Caves

- Bhita is the historical site on Yamuna banks in Ghoorpur.

- It has Sujawan Dev temple on the rock island, a statue of Shringara Devi, Sita Rasoi and Sujawan Dev temple, the area is famous as an ancient Buddhist site with figures of Gautam Buddha supposed to be a monastery.
- Bhita is an ancient Buddhist site of Kushan Era and is under ASI protection.
- The traders from Kausambi travelled towards the Vindhyan hills, would have encountered Bhita, another big city on the plains, a nodal route, one branch leading toward the hills.
- The ancient town planning with its streets and houses, excavated more than century ago.

History of Kaushambi

- Kaushambi was the capital of Chedi-vatsa janapada
- The Satapatha Brahmana mentions a person called Proti Kaushambeya, a native of Kaushambi.
- According to the Paramatthajyotika, the commentary on the Suttanipata, Kaushambi was the hermitage of the sage Kosamba, after whom it came to be known by that name.
- Buddhaghosa records that Kausambi was so named because in course of founding the city, a large number of Kusamba trees were uprooted.
- According to the Jain Vividha-tirtha-kalpa Kaushambi was so called because it abounded in Kusamba trees.
- The city of Kaushambi was important enough to be selected as the new capital of the scion of the Pandavas.
- During Buddha's time Kaushambi was one of the six most important and prosperous towns of India. It is one of the most imposing fortified city sites of India, whose vast brick-built sprawl has historic associations that include the Buddha and Emperor Ashoka.
- The fortified city forms an irregular oblong on the plan. The city was provided with gates on three sides-east, west and north. Besides the bastions, gates and sub-gates, the city was encircled on three sides by a moat. At places the gates are provided with curtain-walls on the outside
- It was a nerve center of ancient Indian communications as the principal routes from north to south and east to west met at the city. It was a terminus of river traffic and an important emporium of Madhyadesa.
- The city retained its importance at least up to the sixth century A.D., as it was visited by the **Chinese pilgrims Fa-Hien and Yuan-Chwang.**

4. International Lusophone Festival

Context: The International Lusophone Festival kicked off on Saturday evening at the Raj Bhavan, in the presence of Goa Chief Minister Pramod Sawant, and MoS Culture and External Affairs Meenakshi Lekhi.

Concept:

What is Lusophone world?

- The Lusophone world is spread in **nine countries across four continents**, and Portuguese is the **most widely-spoken language** in the Southern Hemisphere. With more than 265-million speakers worldwide, it was most widely spoken language in the Southern Hemisphere and regarded as the **language of the first globalisation** in the modern era.
- **Lusophone (Portuguese-speaking countries) economies** are among the fastest-growing in the world, with **Brazil, Angola, Portugal, Mozambique** being some of them.
- **Goa** has had historical linkages with the Lusophone world, nurtured through the presence of Portuguese cultural institutions like the Orient Foundation and the Camoes Institute which promote the Portuguese language and culture in India.
- Portuguese is one of the **official languages** of the continental organizations: **African Union, Organization of American States, European Union and of multiple regional organizations**, as well as official language of **UNESCO General Conference.**

The International Lusophone Festival

- The **Ministry of External Affairs** is organizing the festival in partnership with the **Indian Council of Cultural Relations (ICCR) and the Goa government.**
- In a novel diplomatic step, a way to engage with a new geopolitical grouping of the Lusophone as India wants to leverage the untapped potential and the historical connect.
- Upon India's initiative, this is the first such multi-country cultural event being held among these countries
- The Lusophone Food and Spirits Festival will also showcase the culinary links between India and the Lusophone world.

Community of Portuguese Language Countries (CPLP) or Lusophone Commonwealth:

- The Community of Portuguese Language Countries (CPLP) or Lusophone Commonwealth, was **founded in 1996 in Lisbon**, with **Angola, Brazil, Cabo Verde, Guinea Bissau, Mozambique, Portugal and Sao Tome and Principe** as members; while **Timor Leste and Equatorial Guinea** joined later.

- These countries comprise approximately 300-million people across four continents (**Africa, Latin America, Asia and Europe**).
- India joined CPLP as an associate observer **only in July 2021**

India's Initiatives in CLCP:

- India's trade with the Lusophone world has grown six-fold in the last decade.
- India already **offers training to all CPLP member states, except Portugal**, under the ITEC and IAFS frameworks. Providing technical expertise and capacity building assistance to CPLP countries will enhance people-to-people connect
- Indian assistance to CPLP, to cope with the Covid-19 pandemic through supplies of medicines, medical equipment, vaccines and other Covid-related support. India has offered '**transfer of technology**' for manufacturing of its indigenously developed vaccine **Covaxin** in interested countries
- Round Table discussions themed on "**India's Outreach to the Global South – Exploring Convergence with CPLP**" and "**India-Lusophone Historical and Cultural Linkages: Retrospect and Prospects**" explore not only India's existing and historical Lusophone connect, but also deliberate on the way forward for future engagement

5. Progressive Artists' Group

Context: On the 75th anniversary of the Progressive Artists' Group, a look back at how some of India's most well-known artists came together to explore the confluence of tradition and modernity and what their collaboration meant for Indian art

Concept:

- The Progressive Artists' Group (PAG), was a group of modern artists, mainly based in Bombay, from its formation in **1947**.
- Though it lacked any particular style, there might be said to have been a **move towards a synthesis of influences from Indian art history together with styles prevalent in Europe and North America** during the first half of the 20th century, including Post-Impressionism, Cubism and Expressionism.
- The Progressive Artists' Group (PAG) was formed by six founder members, **F. N. Souza, S. H. Raza, M. F. Husain, K. H. Ara, H. A. Gade, and S. K. Bakre** (the only sculptor in the group). Others, who later got associated with the group included **Manishi Dey, Ram Kumar, Akbar Padamsee and Tyeb Mehta**.
- The group wished to **break with the revivalist nationalism** established by the **Bengal school of art** and to encourage an Indian avant-garde, engaged at an international level.
- The founders of the Progressive Artists Group often cite "**the partition**" as **impetus** for their desire for new standards in visual arts in India, starting with their new style of art.
- Their intention was to "paint with absolute freedom for content and technique, almost anarchic, save that we are governed by one or two sound elemental and eternal laws, of aesthetic order, plastic co-ordination and colour composition displaced by the new borders.
- The group was ultimately **disbanded in 1956**.

The Progressive Artists Group held three exhibitions:

- The first was held in **1948 at the Bombay Art Society's Salon** on Rampart Row, Kalaghoda, Bombay,
- The second show was held in **Kolkata in 1950**;
- The third and the last show was held with three founder members of PAG in which Krishen Khanna, Bhanu Athaiya, V S Gaitonde, A A Raiba also participated in **1953**.

6. Dominique Lapierre

Who is Dominique Lapierre:

- Dominique Lapierre was a French author
- He was awarded the Padma Bhushan, India's third highest civilian award, in 2008.
- He was passionate about India, which was **reflected in his 1985-work City of Joy**, based on the **hardships of a rickshaw puller in Kolkata**, that turned out to be a massive success. It was also **adapted for a movie in 1992** which **starred Patrick Swayze and was directed by Roland Joffe**
- He also **co-authored Five Past Midnight in Bhopal**, a historical **account of the Bhopal gas tragedy told through multiple witness** accounts which he researched by living in the city for three years in the 1990s.
- He co-authored **many renowned books with Larry Collins**:
 - **Is Paris Burning?**
 - **O Jerusalem,**
 - **The Fifth Horseman,**
 - **Is New York Burning?**

- **City of Joy**
- **Freedom at Midnight.**

7. Hyderabad Bansilalpet Stepwell gets restored

Context: The Bansilalpet stepwell, which had turned into a dumpyard over the decades, was unearthed after removing over 2,000 tonnes of debris and relocating families that lived on the site.

Concept:

- The **seventeenth-century stepwell**, which had turned into a dumpyard over the last four decades, was unearthed after removing over 2,000 tonnes of debris and relocating families that lived on the site.
- Over the last year, it was restored to its original glory.
- The well has been completely restored and now holds nearly 20 lakh litres of water and has regained its antique looks with magnificent galleries on the corridors of sixstage stepwell.
- The renovated well is expected to serve as a new cultural space for the city, say officials.
- Plans are on the anvil to restore and develop 43 more stepwells in the city as part of the efforts to **achieve World Heritage City recognition from UNESCO.**

World Heritage Site

- UNESCO World Heritage Sites are designated specific locations such as forest areas, mountains, lakes, deserts, monuments, buildings, or cities, etc. These **are selected by the World Heritage Sites Committee.** This committee oversees these sites with the help of UNESCO.
- The objective of this program is to select and preserve such places of the world which are important for humanity in terms of world culture. UNESCO provides financial assistance to such sites under certain circumstances.
- The list is maintained by the international World Heritage Programme administered by the UNESCO World Heritage Committee, composed of 21 UNESCO member states which are elected by the General Assembly.
- Each World Heritage Site remains part of the legal territory of the state wherein the site is located and UNESCO considers it in the interest of the international community to preserve each site.
- UNESCO believes that the entire world community is responsible for its protection. According to the official website of UNESCO, there are six cultural and four natural criteria for the selection of a world heritage site.

8. Maulana Azad Fellowship for minorities to stop from 2023: Centre

- The Union government has decided to discontinue the Maulana Azad National Fellowship (MANF) from 2022-23 for minorities as according to them, the scheme overlaps with various other fellowship schemes for higher education.

Maulana Azad Fellowship for minorities scheme (MANF)

- The **Ministry of Minority Affairs** implements MANF Scheme for educational empowerment of students belonging to six notified minority communities i.e. Buddhist, Christian, Jain, Muslim, Sikh, Zoroastrian (Parsi).
- The Scheme is implemented through **the University Grants Commission (UGC)** and no waiting list is prepared under the Scheme by UGC.
- Candidates belonging to the Six centrally notified minority are considered for award of fellowship under the MANF Scheme.
- The selection of candidates is done through JRF-NET (Junior Research Fellow- National Eligibility Test) examination conducted by the National Testing Agency.
- Prior to 2019-20, the merit list was prepared on the basis of marks obtained by the candidates in their Post Graduate examination.
- However, in 2018-19, only the candidates who had qualified CBSE-UGC-NET/JRF or CSIR-NET/JRF were eligible to apply.
- As per the data provided by UGC 6,722 candidates were selected under the scheme between 2014-15 and 2021-22 and fellowships to the tune of ₹ 738.85 crores were distributed during the same period.

Contributions of Maulana Abul Kalam Azad

- He was a proponent of Hindu Muslim unity, opposed to Partition.
- In 1912, he started a weekly journal in Urdu called Al-Hilal which played an important role in forging Hindu-Muslim unity after the bad blood created between the two communities in the aftermath of Morley-Minto reforms (1909).
- Under the 1909 reforms, the provision of separate electorates for Muslims was resented by Hindu.
- The government regarded Al- Hilal as a propagator of secessionist views and banned it in 1914.
- Maulana Abul Kalam Azad then started another weekly called Al-Balagh with the same mission of propagating Indian nationalism and revolutionary ideas based on Hindu-Muslim unity.
- In 1916, the government banned this paper too and expelled Maulana Abul Kalam Azad from Calcutta and exiled him to Bihar from where he was released after the First World War 1920.

- He was one of the founding members of the Jamia Millia Islamia University, originally established at Aligarh in the United Provinces in 1920.
- **His Works:** Basic Concept of Quran, Ghubar-e-Khatir, Dars-e-Wafa, India Wins Freedom, etc.
- Azad supported the **Non-Cooperation Movement (1920-22)** started by Gandhiji and entered the Indian National Congress in 1920.
- **In 1923, he was elected as the president of Indian National Congress.** At an age of 35, he became the **youngest person to serve as the President of the Indian National Congress.**
- Maulana Azad was arrested in 1930 for violation of the salt laws as part of Gandhiji's Salt Satyagraha. He was put in Meerut jail for a year and a half.
- He again became the **president of Congress in 1940 and remained in the post till 1946.**

Post-Independence

- In 1947, he became the **first education minister of free India** and remained at this post till his death in 1958. In his tenure, he did tremendous work for the upliftment of the country.
- The first IIT, IISc, School of Planning and Architecture and the University Grants Commission were established under his tenure as the education minister.
- **Indian Council for Cultural Relations**, for introduction of Indian culture to other nations.
- **11th November is observed as National Education Day** every year since 2008 to commemorate his birth anniversary.
- Maulana Abul Kalam Azad was posthumously awarded **India's highest civilian honour, Bharat Ratna in 1992.**

9. 'Salaam Aarati' soon to be renamed as 'Aarati Namaskara' in Karnataka

The decision comes after Hindutva outfits urged the State government to abolish the rituals "performed in the name of Tipu Sultan" at some temples.

- The 'Salaam Aarati' ritual is practised in some temples in Karnataka
- it is believed that the ritual was named by 18th century Mysore king Tipu Sultan during his visits to those temples.
- The State government will soon issue a circular renaming 'Salaam Aarati' ritual followed in some temples in Karnataka as 'Aarati Namaskara'
- Kukke Sri Subrahmanya Temple, Sri Mahalingeshwara Temple at Puttur, Mookambika Temple at Kollur - all in Karnataka
- Now the question arises as to who will decide if the name is to be changed. Does Dharmika Parishat have the right to do so?

Tipu sultan - Brief Profile:

- Born in **November 1750**, Tipu Sultan was **Haidar Ali's son** and a great warrior, also known as the **Tiger of Mysore**.
- He was a **well-educated man** fluent in Arabic, Persian, Kanarese and Urdu.
- Mysore had grown in strength under the leadership of powerful rulers like **Haidar Ali (ruled from 1761 to 1782)** and his famous son **Tipu Sultan (ruled from 1782 to 1799)**.
 - Tipu **introduced a number of administrative innovations** during his rule, including his **coinage**, a new **Mauludi lunisolar calendar**, and a **new land revenue system** which initiated the **growth of Mysore silk industry**.
- Embracing **western military methods** like artillery and rockets **alongside traditional Indian weapons** including war elephants, he ensured his forces could **overwhelm his Indian rivals and match the British armies** sent against him.
 - **Maintenance of Armed Forces:**
- He organised **his army on the European model** with Persian words of command.
 - Though he took the **help of the French officers to train his soldiers**, he never allowed them (French) to develop into a pressure group.
- He was well **aware of the importance of a naval force**.
 - In 1796, he set up a **Board of Admiralty and planned** for a fleet of 22 battleships and 20 large frigates.
 - He **established three dockyards** at Mangalore, Wajedabad and Molidabad. However, **his plans did not fructify**.
 - **Fought Against Marathas:**
- In **1767**, Tipu commanded a corps of cavalry **against the Marathas** in the Carnatic (Karnataka) region of western India, and he **fought against the Marathas** on several occasions **between 1775 and 1779**.
 - **Role in Anglo-Mysore Wars:**
- **British saw Haidar and Tipu as ambitious, arrogant and dangerous** – rulers who had to be controlled and crushed.

- **Four wars were fought** with Mysore (1767-69, 1780-84, 1790-92 and 1799).
 - **1767-69:** Treaty of Madras.
 - **1780-84:** Treaty of Mangalore.
 - **1790-92:** Treaty of Seringapatam.
 - **1799:** Subsidiary Alliance.
- **Only in the last – the Battle of Seringapatam** – did the Company ultimately win a victory. **Tipu Sultan was killed** defending his capital Seringapatam.
- **Mysore was placed under the former ruling dynasty of the Wodeyars and a subsidiary alliance was imposed** on the state.
 - **Other Related Points:**
- He was **also a patron of science and technology** and is credited as the ‘**pioneer of rocket technology**’ in India.
 - He wrote a **military manual (Fathul Mujahidin)** explaining the operation of rockets.
- Tipu was a **great lover of democracy** and a **great diplomat** who gave his **support to the French soldiers** at Seringapatam in setting up a **Jacobin Club in 1797**.
 - Tipu himself became a **member of the Jacobin Club** and allowed himself to be called **Citizen Tipu**.
 - He **planted the Tree of Liberty** at Seringapatam.

Subsidiary Alliance

- In 1798, it was **introduced by Wellesley** in India, the ruler of the allying **Indian state was compelled to pay a subsidy** for the maintenance of British army in return for getting protection from the British against their enemies.
- Those native princes or rulers **who would enter into the Subsidiary Alliance were not free to declare war** against any other power or enter into negotiations **without the consent of the British**.
- The Subsidiary Alliance was a policy of non-interference in the internal affairs of the allied state, but this was a promise seldom kept by the British.
- The payment of the arbitrarily-fixed and artificially-bloated subsidy invariably disrupted the economy of the state and impoverished its people.
- On the other hand, the **British could now maintain a large army** at the cost of the Indian states.
 - They controlled the defence and foreign relations of the protected ally, and had a powerful force stationed at the very heart of his lands.
- Lord Wellesley **signed his first Subsidiary Treaty with the Nizam of Hyderabad** in 1798.
- The **Nawab of Avadh** was forced to sign a Subsidiary Treaty **in 1801**.
- **Peshwa Baji Rao II (Maratha)** signed the Subsidiary Treaty at Bassein **in 1802**.

10. Traditional Art Forms

Context: The recent success of Kannada film Kantara (which showcases **Bhoota Kola**, a spirit worship ritual dance of the Tulu-speaking people of Udupi and Dakshina Kannada in Karnataka) has put the focus back on native cultures such as the **Yakshagana, Daivaradhane, Kambala or Theyyam**.

About Theyyam

- It is a popular **ritual form of dance worship in Kerala and Karnataka**. It consisted of thousand-year-old traditions, rituals and customs.
- The people consider Theyyam itself as a channel to a god and they thus seek blessings from Theyyam.
- Each Theyyam is a man or a woman who attained divine status by performing heroic deeds or by leading a virtuous life.
- Most Theyyams are **believed to be the incarnations of Shiva or Shakti** (the consort of Shiva). Or they have strong associations with these principal deities of Hinduism.
- The main instruments used for thottampattu are Chenda, Veekan Chenda, Ilathalam and Kuzhal.
- Theyyams are **performed in sacred groves** and other places usually once in a year and is known as Kaliyattam.

About Yakshagana:

- Yakshaganais a **traditional Indian theatre form, developed in Karnataka**.
- It **combines dance, music, dialogue, costume, make-up, and stage techniques** with a unique style and form.
- It is believed to have **evolved from pre-classical music and theatre** during the period of the Bhakti
- Most of the stories in yakshagana are drawn from the epics like Ramayana, Mahabharata, Bhagavatha and other mythological episodes.
- The name yakshagana suggests the music of celestial beings.
- Yakshagana is believed to have evolved from the ancient Bhutha-worship prevalent in South Canara and Kasaragod.
- Theyyam is also a manifestation of this Bhutha worship.

About Bhoota Kola/Daivaradhane

- Bhoota means ‘spirit’ and Kola means ‘play’ in Tulu.

- It is **basically a spirit worship ritual celebrated by Tulu-speaking people** in Dakshina Kannada **in Karnataka and some districts of Kerala**.
- Kola is also called 'nema' which means ceremony, which goes on from dusk to dawn.
- The **Kola is performed by professionals** who belong to the lower castes of society
- The performer of the Daiva or Bhoota usually wears a skirt of tender palm leaves which is easily flammable and helps them to perform acts with fire.
- The performer displays an aggressive outlook, dances fiercely and performs multiple rituals.
- This performer is feared and respected in the community and is believed to give answers to people's problems on behalf of the spirit.
- Drums and music give company to the dancing and pooja rituals.
- By praying together during Bhootada Kola, the community seeks God's blessing, prosperity and riddance of various problems the community is challenged with.
- Bhootada Kola is said to have some influence from Yakshagana, a more popular and widely performed folk dance in coastal Karnataka.
- Some of the Bhootada Kola rituals also involve walking on a bed of hot coal.
- **Popular Bhootas:** Panjurli, Bobbarya, Pilipoota, Kalkuda, Kalburti, Pilichamundi, KotiChennayaare some of the popular gods (Bhootas) worshipped as part of Bhootada Kola.

About Kambala

- Kambala is an **annual traditional Buffalo Race** (he-buffalo) held in **coastal districts of Karnataka** to entertain rural people of the area.
- Slushy/marshy paddy field track is used for Kambala.
- The sports season **generally starts in November and lasts till March**.
- The contest generally takes place between two pairs of buffaloes, each pair race in two separate wet rice fields tracks, controlled by a whip-lashing farmer.
- In the traditional form of Kambala, buffalo racing is non-competitive and buffalo pairs run one by one in paddy fields.
- Besides, there is also ritualistic approach also as some agriculturists race their he-buffaloes for thanks giving to god for protecting their animals from diseases.
- But in recent times, Kambala has become an organised rural sport.

11. Dutch PM Apologizes For 250 Years of Slavery

Context: Dutch Prime Minister Mark Rutte on Monday officially apologised for 250 years of the Netherlands' involvement in slavery, calling it a "crime against humanity".

About the news

- The apology comes almost 150 years after the end of slavery in the European country's overseas colonies, which included Suriname and islands like Curacao and Aruba in the Caribbean and Indonesia in the East.
- Dutch ministers have travelled to seven former colonies in South America and the Caribbean for the event.
- The Dutch colonial history is littered with blood and tainted with tales of misery of thousands of slaves who were kidnapped and then sold to markets in Europe and America.
- The Dutch colonized many parts of the world -- from America to Asia and Africa to South America; they also occupied many African countries for years.

Dutch Colonialism in Americas

- The Netherlands began its colonization of the Americas with the establishment of trading posts and plantations, which preceded the much wider known colonization activities of the Dutch in Asia.
- While the first Dutch fort in Asia was built in 1600 (in present-day Indonesia), the first forts and settlements along the Essequibo River in Guyana date from the 1590s.
- Actual colonization, with the Dutch settling in the new lands, was not as common as by other European nations.
- Many of the Dutch settlements were lost or abandoned by the end of the 17th century, but the Netherlands managed to retain possession of Suriname until it gained independence in 1975.
- Among its several colonies in the region, only the Dutch Caribbean still remains to be part of the Kingdom of the Netherlands today.
- **Some of the important dutch colonies were:** Suriname, the Caribbean island of Curacao, Brazil, Chile, Bonaire, Sint Maarten, Aruba, St. Eustatius and Indonesia.

Dutch Colonialism in Africa ('Golden Age' of colonialism)

- The Dutch established colonial rule mostly in the coastal areas of Africa and enjoyed a "golden age" of colonialism between the 15th and 17th centuries.
- The Dutch had established colonial territories in Africa before the English and French came to loot the continent;

they eventually lost their power and handed over territories to the then British Empire and the French in the 18th century.

- The Dutch first went to Ghana, one of its earliest colonies in the 16th century and exploited underground mines, mainly gold, there. Thousands of Africans were abducted and sold as slaves to America and Europe from Ghana by the Dutch; they were taken through the Elmina Castle built in Ghana in 1642.
- The colonial Dutch arrived in the coast of Namibia in 1793 and seized the port of Walvis Bay, the most popular port of the country, and slaughtered the inhabitants there.
- The port of Walvis Bay, which was seized by the Dutch, was then used as a slave port.
- They colonized many parts of Africa, including **Ivory Coast, Ghana, South Africa, Angola, Namibia and Senegal.**

Khoikhoi massacre

- The Dutch also carried out massacres to enslave the **Khoikhoi tribe in Cape Town** in 1659 and 1673 and between 1674 and 1677.
- The massacres of the Khoikhoi people by the Dutch is the most well-known of the Dutch colonial traces in Africa.
- The Dutch had attacked the Khoikhoi tribe with firearms, killing thousands of Africans. They also confiscated their homes and lands, abducted them as slaves and exploited the natural resources of the region.

12. Modhera temple and Vadnagar make it to UNESCO tentative list

- Three heritage sites were added to the tentative list of UNESCO World Heritage sites namely; the **Sun Temple at Modhera and Vadnagar town from Gujarat and rock-cut relief sculptures of Unakoti of Tripura.**

Tentative List of UNESCO:

- According to UNESCO, A Tentative List is an inventory of those properties which each nation intends to consider for nomination.
- As per Operational Guidelines, 2019 of UNESCO, it is **mandatory to put any monument/site on the Tentative List (TL) for one year** before it is considered for the final nomination dossier.
- Once the nomination is done, it is **sent to the World Heritage Centre (WHC).**

Sun Temple of Modhera

- The Sun Temple, **Modhera dedicated to Surya dev** (The Sun God), is one of the remarkable gems of temple architecture in India.
- It is an exemplary model of the **Maru-gurjara architecture style of the 11th century of western India** under the patronage of the **Solanki dynasty.**
- The age of the temple may be inferred from its style belonging to the reign of Bhimadeva I (1022-1063 CE).
- It consists of the main temple shrine (garbhagriha), a hall (gadhamandapa), an assembly hall (Sabhamandapa or rangamandapa) and a sacred pool (Kunda) which is now called Ramakunda.
- This east-facing temple is built of bright yellow sandstone.
- **Other sun temples in India** are 8th century CE Martand Sun Temple in Kashmir and the 13th century CE Sun temple at Konark.

Rock-cut relief sculptures of Unakoti

- The site of Unakoti Rock-cut relief sculptures is located in the north-eastern part of Tripura, which was built **during 8th to 12th CE.**
- The vertical surface of the Unakoti hills was used by the ancient people to carve various mythological scenes such as the different iconographic forms of Siva, Ganesha, Uma-Maheshwara.
- The images found at Unakoti can be classified into two categories:
- Majestic rock-cut images on the vertical surface of the hill and fallen boulders.
- Loose sculptures of smaller and medium sizes scattered on the hill.
- The **influence of Buddhism** is also seen in the sculptures of the region.
- There are various depictions of Bodhisattavas, Buddha and Buddhist motifs also found here.
- Many images found in this area also suggest the presence of religious sects such as Sakta, Tantric, Bajrayanis and Nathayogis.

Vadnagar

- Vadnagar was situated at a strategic location where two major ancient trade routes crossed each other.
- One of them joined central India with the Sindh and further northwest regions while another connected the port towns on the Gujarat coast to northern India.
- Vadnagar town is a multi-layered and multi-cultural mercantile settlement with its history stretching back to nearly 8th Century BCE.

13. Palm Leaf Manuscript Museum

- Chief Minister Pinarayi Vijayan will inaugurate a palm-leaf manuscript museum with modern audio-visual technology at the renovated Central Archives, Fort, here on Thursday.

About the news

- The Archives Department in association with Kerala Museum of History and Heritage has set up a palm-leaf manuscripts museum in the Fort area in Thiruvananthapuram.
- The museum is located in a 400-year-old building which now holds the regional office of the State Archives Department.
- It will feature a **rare collection of over one crore palm-leaf manuscripts** available with the Archives Department with the aim of communicating their importance to the public.
- Manuscripts featuring ancient alphabets, including **Vattezhuthu, Kolezhuthu and Malayanma** will also be on display.
- Representative ones will be selected from the vast collection of palm-leaf manuscripts, and be put up for display.
- Visitors will first be greeted with an introductory session that highlights the history and importance of palm-leaf manuscripts in the state.
- The museum will be divided into three sections, namely Travancore, Kochi and Malabar and these will again have subsections.
- A heaven for history enthusiasts, the museum is expected to give a strong boost to research into the manuscripts..

About Palm Leaf Manuscripts:

- Palm-leaf manuscripts are manuscripts made out of dried palm leaves.
- Palm leaves were **used as writing materials** in the Indian subcontinent and in Southeast Asia reportedly **dating back to the 5th century BCE**.
- Their **use began in South Asia** and spread to other regions, as texts on dried and smoke-treated palm leaves of Palmyra palm or the talipot palm.
- Their use **continued till the 19th century**, when printing presses replaced hand-written manuscripts.
- One of the oldest surviving palm leaf manuscripts of a complete treatise is a **Sanskrit Shaivism text** from the **9th-century**, discovered in Nepal, now preserved at the Cambridge University Library.
- The Spitzer Manuscript** is a collection of palm leaf fragments found in Kizil Caves, China.
- They are dated to about the 2nd-century CE and are the oldest known philosophical manuscript in Sanskrit related to buddhism.

Regional Variations

- Southeast Asia:** With the spread of Indian culture to Southeast Asian countries like as Indonesia, Cambodia, Thailand, and the Philippines, these nations also became home to large collections.
- Palm-leaf manuscripts called Lontar** in dedicated stone libraries have been discovered by archaeologists at Hindu temples in **Bali Indonesia** and in 10th century Cambodian temples such as **Angkor Wat and Banteay Srei**.
- Odisha:** Palm leaf manuscripts of Odisha include scriptures, pictures of Devadasi and various mudras of the Kama Sutra.
- Tamilnadu:** Palm leaf manuscripts were used in the Tamil grammar book named **Tolkappiyam** which was written around 3rd century BCE.

14. All is well for moa makers this winter

It is a seasonal Bengali sweetmeat delicacy prepared from date palm jaggery and Kanakchur khoi. This variety of Moa originated in Jaynagar of the South 24 Parganas district in the Indian state of West Bengal. It is now a popular sweet, being produced in Kolkata and elsewhere, sometimes with cheaper ingredients and chemical flavours. Jaynagarer Moa was given a Geographical Indication tag in 2015 which will enable the product to be protected from unauthorized uses and piracy

15. Muhammad Iqbal, also the poet of Saare Jahan Se Achcha

Context: Amid VHP row over song in school, recalling Muhammad Iqbal, also the poet of Saare Jahan Se Achcha Recitation of the prayer ‘Lab Pe Aati Hai Dua’ written by Muhammad Iqbal has once again triggered a controversy — this time in UP’s Bareilly district. After a complaint from a Vishwa Hindu Parishad (VHP) official in the district, the **principal of a government school and a Shiksha Mitra** was booked for “hurting religious sentiments” after a video of students reciting the prayer during the morning assembly went viral.

Earlier incident:

- In October 2019, the headmaster of a government primary school in the Bisalpur area of Pilibhit was suspended.
- In that case, too, the students had recited Allama Iqbal’s ‘Lab Pe Aati Hai Dua’.

The poet and his poems:

- The prayer ‘**Lab Pe Aati Hai Dua**’ was written by **Iqbal** in **1902**.
- Among Iqbal’s many writings, the most celebrated is the immortal ‘**Saare jahan se achcha Hindustan hamara**’, written in **1904**, his beautiful ode to India, which became one of the songs that inspired the freedom fighters against British rule.
- **Iqbal’s first published collection of poems came out in 1923**, and was titled ‘**Bang-e-Dara**’ (Call of the Marching Bell).
- He wrote mostly in **Urdu** and **Persian**.

About Mohammad Iqbal:

- **Mohammad Iqbal (1877-1938)** was born to a family with **Kashmiri Pandit ancestry** that had embraced Islam in the seventeenth century.
- **Iqbal was born in Sialkot, Punjab** (now in Pakistan) and **died in Lahore** when he was aged 60 years.
- Iqbal’s **tomb** is located in **Hazuri Bagh in Lahore**.
- Iqbal is commonly referred to as **Allama** (most learned), which is a title given to Islamic scholars.
- Apart from being a writer, **Iqbal was also a lawyer** and appeared at the Lahore High Court in several cases.
- After completing his **BA and MA at Government College, Lahore**, he went on to study in Europe in 1905.
- At Trinity College, Cambridge, he completed a second bachelor's degree, and completed a PhD at the University of Munich later.
- In **1922**, he was **knighted by King George V**, giving him the **title of “Sir”**.
- After the creation of Pakistan in 1947, he was named the **national poet** there.
- **Iqbal was the first patron of Tolu-e-Islam**, a historical, political, religious and cultural journal of the Muslims of British India.
- He is also known as the “**Hakeem-ul-Ummat**” (“The Sage of the Ummah”) and the “**Mufakkir-e-Pakistan**” (“The Thinker of Pakistan”).
- **Abul Hasan Ali Hasani Nadwi** wrote **Glory of Iqbal** to introduce him to the **Arab world**.

The idea of Pakistan:

- Iqbal espoused the idea of Muslim-majority provinces in 1930.
- Iqbal elucidated to Jinnah his vision of a separate Muslim state in a letter sent on 21 June 1937.
- In that country, Iqbal is regarded as the ideological founder of the nation — the man who envisioned the state in that Jinnah gave physical shape.

Madani–Iqbal debate:

- A famous debate was held between **Iqbal** and **Hussain Ahmed Madani** on the question of nationalism in the late 1930s.
- **Madani’s position** throughout was to insist on the Islamic legitimacy of embracing a culturally plural, secular democracy as the best and the only realistic future for India’s Muslims whereas **Iqbal insisted on a religiously defined, homogeneous Muslim society**.
- **Madani and Iqbal both never advocated** the creation of an absolute ‘**Islamic State**’. They differed only in their first step.
 - According to **Madani**, the first step was the freedom of India for which composite nationalism was necessary.
 - According to **Iqbal**, the first step was the creation of a community of Muslims in the Muslim-majority land, i.e. a Muslim India within India.

16. Indian History Congress

Context: 81st session of the Indian History Congress (IHC) at the Madras Christian College, Chennai.

About Indian History Congress:

- Indian History Congress (IHC) was founded in **1935**.
- IHC is the **largest association** of professional historians in South Asia.
- It has about 35000 members of which over 2000 delegates participate in its session every year.
- It has been **holding its sessions very regularly** from its inception and **publishing its proceedings every year** since 1935.
- **Origin:**
 - IHC can be traced to the efforts of scholars working on India’s ancient past as well as modern history, in a bid to counter the colonial claims, while also drawing from Western analytical methods.
 - **Bharata Itihasa Samshodhaka Mandala (BISM)** was one such effort that owed its origins to the stalwart **Vishwanath Kashinath Rajwade**. He founded this institution in 1910 in Pune with the support of K C Mehendale.

- BISM organised an All India Congress in 1935 to celebrate its silver jubilee. The Indian History Congress (IHC) was thus born with about 50 delegates.
- **Mandate:**
 - To regulate the standard of works of history produced in India.
 - To promote impartial and substantive history.
 - To commit to a fair and scientific history, devoid of bias and politics.
- Historians **Ram Sharan Sharma, Satish Chandra, Bipan Chandra, Romila Thapar, B. N. Mukherjee, K. N. Panikkar, Brajadulal Chattopadhyay, Dwijendra Narayan Jha, Sumit Sarkar, Sabyasachi Bhattacharya** have had a long association with the Indian History Congress.

17. Agra and Kohinoor

Introduction: The Koh-i-Noor is a large, colorless diamond that was found close to Guntur in the state, India, probably within the thirteenth century. It weighed 793 carats (158.6 g) uncut and was initially owned by the Kakatiya dynasty.

Timeline of Possession

- **14th Century AD:** In the early 14th century, Alauddin Khilji, second ruler of the Turkic Khilji dynasty of the Delhi Sultanate, and his army began to rob the kingdoms of southern India. **Malik Kafur, Khilji's general, created a victorious raid on Warangal in 1310** when he probably acquired the diamond.
- **16th Century AD:** It remained within the Khilji family line and later passed to the succeeding dynasties of the Delhi Sultanate, till it came into **the possession of Babur**.
- **17th Century AD:** Shah Jahan, the fifth Mughal emperor, had the **stone placed into his ornate Peacock Throne**. In 1658, his son and successor, Aurangzeb, confined the unwell emperor at nearby Agra Fort. Whereas within the possession of Aurangzeb, weight of the stone was reduced from 793 carats (158.6 g) to 186 carats (37.2 g). For this carelessness, Borgia was admonished and punished 10,000 rupees.
- **18th century (1739 AD):** Following the **1739 invasion of Delhi by Nader Shah**, the Shah of Persia, the treasury of the Mughal Empire was plundered by his army in AN organized and through the acquisition of the Mughal nobility's wealth. Besides a bunch of valuable things, together with the Daria-i-Noor, as well as the Peacock Throne, the Shah conjointly carried away the Koh-i-Noor.
- **18th Century (1747 AD):** After **the assassination of Nader Shah in 1747** and also the collapse of his empire, the stone came **into the hands of one of his generals, Ahmad Shah Durrani**, who later became the amir of Islamic State of Afghanistan.
- **19th Century (1813 AD):** After Ahmad Shah the Diamond came into possession of Ahmad Shah Durrani's descendent **Shauja Shah Durrani**. Shah Shuja Durrani **brought the Koh-i-door back to India in 1813 and gave it to Ranjit Singh** (the founding father of the Sikh Empire). In exchange, Ranjit Singh helped Shah Shuja retreat to the throne of Islamic State of Afghanistan.
- **19th Century (1849 AD):** On twenty-nine March 1849, following the conclusion of the **Second Anglo-Sikh War**, the dominion of Punjab was formally annexed to British India, and also the **Last treaty of Lahore was signed, formally cession the Koh-i-Noor to Empress and the Maharaja's other assets to the company**.

Some Historical Facts about Agra and rulers of Agra:

- Agra was **founded by Badal Singh** in the year 1475.
- In the year **1506, Sikandar Lodi** started the reign of the **Delhi Sultanate in Agra**.
- Agra became a major city for the Mughal Empire after the **first battle of Panipat in 1526**. It was **captured by Babur**, after defeating the Lodhis.
- The original name of Babur was **Zahiruddin Muhammad**. He was the son of Omar Sheikh, the **Timurid ruler of Farghana**.
- With all the glory and wisdom of the Mughals, **Agra remained the second capital of India from 1504 to 1658**.
- **Abul Fazl** called it **Darul Khilafat**, and **Delhi** was **Darul Sultanat**
- **Arjumand Bano Begum**, was the real name of Mumtaz Mahal.
- **Amanat Khan Shirazi** was the famous calligraphist of the Mughals.

18. A look at Malik Ahmed and Ahilyabai Holkar

Context: The Maharashtra Education Minister has sought a proposal from the district administration to rename the Western Maharashtra city of Ahmednagar as 'Punyashlok Ahilyadevi Nagar', after the **18th century Malwa queen, Ahilyabai Holkar**.

Details:

- In August this year, the Maharashtra Assembly unanimously passed two separate resolutions to send a proposal to rename **Aurangabad as Chhatrapati Sambhaji Nagar** and rename **Osmanabad as Dharashiv**.

What is the procedure of renaming a city?

- The task of renaming a city is given to the **State Legislators**.
- The **procedure differs from state to state** but the regulations remain the same.
- The **first step** involves raising a request in the form of a resolution by any **MLA**, which proposes the renaming of any particular city or street.
- On the basis of the request of the MLA, the issue would be deliberated upon and the consequences of the same shall be discussed upon.
- The **final step** involves voting on the **validity of the resolution**.
- If a **simple majority** is attained in favour of the resolution, the said resolution shall be declared passed.
- The **State Legislation** on the basis of the majority view shall make the necessary changes in the name of the state or city public.
- The **proposal will go to the Centre for approval before the city is officially renamed**.

Historical significance of Ahmednagar:

- **Ahmednagar** lies in the **Western region of Maharashtra**.
- According to the district's official website, it has been a part of some prominent kingdoms, starting from **240B.C.** when the vicinity is mentioned in the reference to the **Mauryan Emperor Ashoka**.
- The **Rashtrakuta Dynasty**, the **Western Chalukyas**, and then the **Delhi Sultanate** ruled over the region in the Mediaeval period.
- In the last case, the rule was not direct, and a revolt by Afghan soldier **Alladin Hasan Gangu** led to the establishment of the **Bahmani kingdom** in the Deccan.

How did the city of Ahmednagar first get its name?

- After some time, **Ahmednagar** (then known as **Nizamshahi**) became **one of the five independent kingdoms** to emerge from that empire.
- In **1486**, **Malik Ahmad Nizam Shah** became the **Bahmani Sultanate's Prime Minister**.
- He fought back an attempt by the king to dislodge him from power, and defeated the army of the Bahamani kingdom near **Ahmednagar** in **May 1490**.
- Finally, in **1494** he laid the **foundation of a city** close to where he defeated the army, on the **left bank of Sina river**, and named it after himself: **Ahmednagar**.

Hindu origin of Nizam shah:

- **Jawaharlal Nehru**, in his book **A Discovery of India (1946)**, wrote of him, "**Ahmad Nizam Shah**, the founder of **Ahmadnagar** in **1490**, was the **son of Nizam-ul-Mulk Bhairi**, a minister of the Bahmani kings.
- This **Nizam-ul-Mulk** was the **son of a Brahmin accountant named Bhairu**. Thus the **Ahmednagar dynasty was of indigenous origin.**"
- Nizam Shah also later captured the **fort of Daulatabad** and stationed his army there.
- By his kindness, peaceful demeanour & efficiency, he could win the loyalty of the local and foreign Muslims and also of the Maratha peasants and warriors.
- Since his **origin was Hindu**, he found no difficulty in winning over the confidence of Brahmins, who were highly regarded by the Hindus.

Who was Ahilyabai Holkar?

- Born in **Chondi village** of **Ahmednagar** to the village head **Mankoji Shinde**, on **May 31, 1725**, **Ahilyabai** was one of the **few women rulers of Medieval India**.
- While the education of girls and women was rare at that time, **Mankoji** insisted on it for his daughter.
- When she was **eight years old**, **Malhar Rao Holkar**, the army commander to **Peshwa Bajirao**, is believed to have spotted her at a temple service in Chondi.
- Impressed by her devotion and character, he decided to get his son, **Khande Rao**, married to her.
- **Ahilyabai** took control of **Malwa** after her husband's death in the **Battle of Kumbher** against the **king of Bharatpur in 1754**.
- She established **Maheshwar (in Madhya Pradesh)** as the seat of the Holkar Dynasty.
- She defended the Malwa state against intruders and personally led armies into battle, with **Tukoji Rao Holkar** as her military commander.

Role in administration and temple-building:

- **Nehru** described **Holkar's rule**, which lasted for **thirty years (1765-1795)**, as "almost legendary as a period during which perfect order and good government prevailed and the people prospered. She was a very able ruler and organiser, highly respected during her lifetime."
- Under her rule, **Malwa remained an oasis of stability and peace**.

- Under Holkar, the **city of Maheshwar** became a literary, musical, artistic and industrial centre, and she helped establish a **textile industry** there, which is now home to the famous **Maheshwari sarees**.
- In **1780**, she had the **Kashi Vishwanath temple** in Varanasi rebuilt, nearly a century after Mughal king Aurangzeb ordered its destruction.
- Apart from holy sites like Badrinath, Dwarka, Omkareshwari, Gaya, and Rameswaram, Holkar also supported the construction of resting lodges for travellers, and of public ghats.
- In **1783 Maharani Ahalyabai Holkar of Indore** built another **Somnath temple** next to the original site, which was in serious disrepair.



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GEOGRAPHY

1. Coastal Red Sand Dunes of AP

Context: Scientists urge Andhra Pradesh govt. to protect glacial-period coastal red sand dunes of Vizag to **study the impact of climate change** as it has seen both the glacial and the warm periods.

Content:

- The coastal red sand dunes are popularly known as '**Erra Matti Dibbalu**'.
- The site is about **18,500 to 20,000 years old** and it can be related to the **last glacial period**.
- The uniqueness of this site is that the **red sediments** are a **part of the continuation of the evolution of the earth** and represent the **late quaternary geologic age**.
- With a height of up to 30 m, they exhibit **bad land topography** with different **geomorphic landforms and features**, including **gullies, sand dunes, buried channels, beach ridges, paired terraces, the valley in the valley, wave-cut terrace, Knick point and waterfalls**.
- The **top light-yellow sand unit** (estimated to have been deposited around 3,000 years ago) **could not attain the red colouration** as the sediments were **geochemically unaltered**.
- These sediments are **un-fossiliferous** and deposited over the **khondalite basement**.
- The dunes consist of **light-yellow sand dunes at the top** followed by a **brick red sand unit, a reddish-brown concretion** bearing sand unit **with yellow sand at the bottom**.
- The site also has archaeological significance, as studies of artefacts indicate an **Upper Palaeolithic horizon** and on cross dating assigned to **Late Pleistocene epoch**, which is 20,000 BC.
- This site was declared as a **geo-heritage site** by the Geological Survey of India (GSI) in **2014** and the **Andhra Pradesh government** has **listed it** under the category of '**protected sites**' in **2016**.
- These sand deposits are rare and have been **reported only from three places in the tropical regions** in south Asia such as **Teri Sands in Tamil Nadu, Erra Matti Dibbalu in Visakhapatnam and one more site in Sri Lanka**.
- They **do not occur in equatorial regions or temperate regions** due to many scientific reasons.

2. Maliparbat bauxite mine

Context: The maliparbat villagers clashed with the district administration and Hindalco officials during a public hearing by the State Pollution Control Board (SPCB) at Kankaramba village on environmental clearances (EC) to the company for mining. The next public hearing that will be presided over by the collector and the district judge, Koraput and the secretary, district legal services authority, Koraput will remain present as neutral observers for the event.

Concept:

- The bauxite mine at Maliparbat hill range is located in Pottangi tehsil of Koraput district of Odisha. The bauxite mined out from the Maliparbat mine will be used in existing Hindalco's Alumina refineries located at Renukoot (Uttar Pradesh), Muri (Jharkhand) & Belgaum (Karnataka).
- The Nearest highway is NH-43, the Nearest railway station Damanjodi, Nearest airport Visakhapatnam Airport
- Some rivers in the 5km range are Kukurhaghat Nala, Kunduli Nala, Kolab River
- Hindalco Industries is one of the leading producers of aluminium in the country. The company business involves bauxite mining to alumina refining. Hindalco Industries was granted EC for an area of 268.110 hectares of Maliparbat bauxite mine in 2006.

About Bauxite –

- Bauxite is an important ore that is used for making aluminium. It is an oxide of aluminium. It is not a specific mineral but a rock consisting mainly of hydrated aluminium oxides.
- The deposits of Bauxite are mainly associated with laterites and occur as capping on hills and plateaus, except in coastal areas of Gujarat and Goa.
- Production of Aluminium from Bauxite: This industry is divided into 2 segments. The plants for obtaining alumina from bauxite ore, such plants are located near bauxite mines and plants for reduction of Alumina into Aluminium, such plants are located near the cheap source of electricity.
- Bauxite is primarily used to produce alumina through the Bayer process.
- Like many metals, world demand for aluminium, and therefore bauxite, has grown substantially over the past 10 years in response to economic growth in emerging Asian economies.

Distribution of Bauxite in the world

- The world bauxite reserves are estimated at 28 billion tonnes and are located mainly in Guinea (26%), Australia (22%), Brazil (9%), Vietnam (8%), Jamaica (7%), Indonesia (4%), Guyana & China (3% each).
- Australia continues to be the major producer of Bauxite and accounts for about 30% share in total world production, followed by China (25%), Brazil (14%), India (8%) and Guinea (7%).

Deposits of Bauxite in India

- There are abundant bauxite reserves in the country. However since they are located in heavily forested areas, inhabited by indigenous people; mining has been unable to start in these regions.
- By States, Odisha alone accounts for 53% of country's resources of bauxite. The ranking of states in terms of bauxite resources is as following
 - a) Odisha (53%)
 - b) Andhra Pradesh (16%)
 - c) Gujarat (8%)
 - d) Jharkhand (5%)
 - e) Madhya Pradesh, Maharashtra and Chhattisgarh (4% each).

3. Indonesia's Mount Semeru volcano erupts, top alert status triggered

In the news-

- **Indonesia's Mount Semeru** erupted Sunday spewing hot ash clouds a mile into the sky and sending rivers of lava down its side, prompting authorities to raise the alert status to the highest level.

Details about the eruption-

- Located on Indonesia's main island of Java, around 800 kilometres (500 miles) southeast of the capital, Jakarta.
- Caused by **piles of lava** at the tip of the **3,676-metre** (12,000 feet) volcano slid down after the eruption.

One year after the last eruption-

- **Mount Semeru** last erupted exactly one year ago, killing at least 51 people and damaging more than 5,000 homes.
- Semeru's alert status had remained at its **second-highest level** since its previous major eruption in December 2020, which also forced thousands to flee and left villages covered.

Why volcanic eruption in Indonesia-

- **Indonesia** sits on the **Pacific Ring of Fire**, where the meeting of continental plates causes high volcanic and seismic activity.
- The Southeast Asian archipelago nation has nearly **130 active volcanoes**.
- A volcano in the strait between **Java and Sumatra islands** erupted in late 2018, causing an **underwater landslide** and **tsunami** that killed more than 400 people.

About Mount Semeru-

- The **Semeru or Mount Semeru** is an **active volcano** located in **East Java, Indonesia**.
- It is located in a **subduction zone**, where the **Indo-Australian plate subducts** under the **Eurasia plate**.
- It is the **highest mountain on the island of Java**.
- The name "Semeru" is derived from Meru, the central world mountain in Hinduism, or Sumeru, the abode of gods.
- This **stratovolcano** is also known as **Mahameru**, meaning "**The Great Mountain**" in Sanskrit.

4. Major rivers in Africa ran drier than usual in 2021, finds WMO

Context:

- The volume of water in Africa's major rivers decreased in **2021** compared to the average in the last two decades, according to a new report by a United Nations body.

State of Global Water Resources report-

- The first edition was published by the **WMO**.
- The water discharge of **Niger, Volta, Nile and Congo rivers** in **2021** was less than the average calculated from 2002-2020.
- The **water storage levels** in the river basins, however, have **gone up since 2002**, an anomaly compared to the rest of the world.
- The water storage levels, also known as **terrestrial water storage (TWS)**, in these river basins have gradually increased since 2002.
- The rise in TWS was seen in Congo, Nile, Zambezi, Orange, Lake Victoria and other parts of North Africa and Madagascar.
- The rise in water storage in Lake Victoria due to intense rains were attributed to climate change.
- TWS has gone down in all other continents other than Africa from 2002-2021.

Lake victoria-

- Lake Victoria, also called **Victoria Nyanza, largest lake in Africa** and chief reservoir of the **Nile**, lying mainly in **Tanzania and Uganda** but bordering on **Kenya**.
- Its area is 26,828 square miles (69,484 square km).
- Among the freshwater lakes of the world, it is exceeded in size only by Lake Superior in North America.
- It is an irregular quadrilateral in shape.

- Many archipelagos are contained within the lake, as are numerous reefs, often just below the surface of the clear waters.
- Lake Victoria has more than 200 species of fish, of which the **Tilapia** is the most economically important.

Important rivers of Africa-

River Nile	<ul style="list-style-type: none"> • This is the longest river in the world. • It starts from many streams in the equatorial rainforest of the Lake Victoria and Ruwenzori Mountain (the mountains of the moon) region. • From Lake Albert, it flows as the White Nile. • At Khartoum, it is joined by the Blue Nile which starts from Lake Tana on the Ethiopian Highlands. • The Nile flows from 3,000 kilometers through the dry Sahara Desert of Egypt and enters the Mediterranean Sea. • Egypt is called the gift of the Nile because without the river it would have been a desert. • Cotton cultivation, • Petroleum at mouth, navigable, irrigation • Aswan dam, lake Naseer • Port Said and Alexandria at the mouth • Cairo, Giza, Khartoum cities are on River Nile
River Congo or Zaire	<ul style="list-style-type: none"> • The Congo is the second-longest river in Africa. • It starts from the south-west of Lake Tanganyika and flows into the Atlantic Ocean. • The Zaire basin is one of the wettest regions of the Earth and is covered with dense impenetrable jungle. • The river and its network of tributaries are not navigable because of rapids and waterfalls caused by the descent from the plateau to the coast. • Origin: Katanga Plateau • Boyoma waterfall • Pigmy tribes • Petroleum reserve at the mouth • Crosses equator twice
River Niger	<ul style="list-style-type: none"> • This river is the chief river of West Africa. It rises from the Fout Djallon Mountain quite close to the sea but flows north and then turns south again to form a wide arc. • Finally, it joins the Gulf of Guinea on the Atlantic Ocean.
River Zambezi	<ul style="list-style-type: none"> • River Zambezi flows into the Indian Ocean. • The famous Victoria Falls at the head of a long gorge is on this river.
River Limpopo	<ul style="list-style-type: none"> • River Limpopo also flows into the Indian Oceans, which crosses the Tropic of Capricorn twice.
River Orange	<ul style="list-style-type: none"> • This flows from the Drakensberg Mountains into the Atlantic Ocean.

Important lakes of Africa-

Victoria	Tropical Lake, 2nd largest freshwater lake in the world.
Tanganyika	Rift Valley Lake, largest lake by volume in the world.
Malawi	African Rift Valley
Turkana	Alkaline Lake

Lake Albert	Western Rift
Lake Edward	Drain North into Lake Albert
Lake Kivu	Ruzizi River
Lake Tana	On the Ethiopian Plateau. It is the source of the Blue Nile.
Lake Chad	At the southern edge in the Sahara Desert is in a region of inland drainage.
Lake Kariba	Situated in the southernmost part of Africa a Zambezi river. It is one of the biggest looks man-made like and it is the largest producer of hydroelectricity in Africa.
Lake Assal	Situated in Djibouti and the lowest point in Africa.

5. UN Groundwater Summit 2022 to help raise awareness on aquifer protection, sustainable use

Context- The importance of protecting groundwater and methods for its sustainable use will be the highlights of the **United Nations-Water Summit on Groundwater 2022** that begins December 7, 2022, in **Paris, France**.

Organised by

- The **two-day conference** will be organised by **UN-Water, UNESCO** and the **International Groundwater Resources Assessment Centre**.
- The discussions will highlight the opportunities and challenges of groundwater management across the world as presented in The United Nations World Water Development Report 2022.
- **Aim-** To raise awareness of groundwater conservation on the global stage.
- **UN-Water** is also running the campaign- Groundwater: Making the invisible visible.
 - The **campaign** highlighted the **role of groundwater** in alleviating poverty, food and water insecurity and other socioeconomic development hurdles.

United Nations Water (UN-Water)-

- It is an **interagency mechanism** that coordinates the efforts of **United Nations** entities and international organizations working on water and sanitation issues.
- Over 30 UN organizations carry out water and sanitation programmes, reflecting the fact that water issues run through all of the UN's main focus areas.
- UN-Water's role is to coordinate so that the UN family 'delivers as one' in response to water-related challenges.
- The majority of the offices are located in **Geneva, Switzerland**.

6. Cyclone Mandous to form December 7 will be slow-moving

Context- A cyclone may impact the Tamil Nadu and Puducherry coasts from December 8 onwards.

About the cyclone mandous-

- **Name** suggested by the **United Arab Emirates**.
- **Location-** Southern Bay of Bengal on the coasts of Tamilnadu and Pudduchhery.
- A low-pressure area formed over the **south Andaman Sea** and intensified into a well-marked low-pressure area.
- **Slow-moving cyclones** often absorb a lot of moisture, carry humongous amounts of rainfall and gain strength in the form of wind speeds.
- Data from the **European Centre for Medium-Range Weather Forecasting (ECMWF)** and the **Global Forecasting System (GFS)** of the **United States** showed that the system is moving quite slowly after its intensification into a cyclone.

7. No plan to privatize Singareni Collieries Company

Context: Coal Minister Pralhad Joshi on Wednesday said that there is no plan to privatize PSU miner Singareni Collieries Company (SCCL).

Concept:

- SCCL is a joint ownership of Telangana government and the center on a 51:49 equity basis. Since the government of Telangana is the majority stakeholder with 51 per cent, it is not possible for the government of India to privatize SCCL.

About Singareni Coal Mine

- 185 km east of Hyderabad in the Godavari Basin
- 4 coal seams have been identified
- Contains 56.5 % fixed carbon
- Although it is non-coking coal, its quality is improved by the Regional Research Laboratory at Hyderabad.

Coal Mines in Telangana and Andhra Pradesh

- Andhra Pradesh produces about 9.72 percent of India's coal.
- Most of the coal reserves are in the **Godavari valley spread over the districts of Adilabad, Karimnagar, Warangal, Khammam, East Godavari, and West Godavari.**
- The actual workable collieries are situated at **Singareni and Kothagudem.**
- Almost the entire coal is of **non-coking variety.**
- These are the southernmost coalfields of India and a **source of coal supply to most of south India.**

8. Behind Mumbai's unusually foul air, changes in wind pattern

Context: Over the last one month, the air quality of the financial capital is distinctly poorer compared to previous year.

Prolonged bad air quality in Mumbai-

- **SAFAR app** is showing the overall **air quality index (AQI)** in **Delhi is 249** (poor) while that in **Mumbai is 309** (Very poor).
- **Mumbai has an locational advantage-** its relatively cleaner air is due to strong sea breezes which sweeps the pollutant away from the land surface.
- Earlier Mumbai has seen the rise in air pollutants but this time the phase of bad air quality is particularly prolonged.

Probable reason for bad air quality-

- **Slower wind speed-** Wind speed in Mumbai is relatively slower this year, reducing its ability to sweep away pollutants.
- **Change in flow pattern-**
 - Generally, In Mumbai, the wind flows from land to sea for a few days and then from sea to land. This cycle gets repeated every 3-4 days.
 - When the wind flows from land to sea, it sweeps away the pollutants.
 - But this year, the cycle is getting delayed from 3-4 days to more than 10 days. This led to large scale accumulation of air pollutants over the city.
- Rise in **PM 10 pollutant** suggests the cause of bad air quality could be large scale **increases in construction activities.** As **PM2.5** mostly comes from vehicular or Industrial emissions of power plants, while **PM10** comes from large scale construction activities.

9. India-China clash: What has happened in Tawang, Arunachal Pradesh

- The Defence Minister told Lok Sabha that on December 9, PLA troops carried out an incursion ("atikraman") across the LAC in Yangtse area of Tawang sector in Arunachal Pradesh, and attempted to unilaterally change the status quo.

About Tawang

- Tawang is a town in the Indian state of Arunachal Pradesh.
- The town was once the capital of the Tawang Tract, which is now divided into the **Tawang district and the West Kameng district.** Tawang continues as the headquarters of the former.
- Tawang is situated 448 km north-west of state capital Itanagar at an elevation of approximately 3,048 metres (10,000 ft).
- It lies to the north of the Tawang Chu river valley, **roughly 10 miles (16 km) south of the Line of Actual Control with China.**
- It is the site of a **famous Gelugpa Buddhist monastery (Tawang Monastery).**

About Tawang Monastery

- It is the largest monastery in India and second largest in the world after the Potala Palace in Lhasa, Tibet.
- Tawang Monastery is known in Tibetan as Gaden Namgyal Lhatse, which translates to "celestial paradise in a clear night."
- It was in 1680-1681 in accordance with the wishes of the 5th Dalai Lama, Ngawang Lobsang Gyatso (1617–1682).
- It belongs to the Gelug school of Mahayana Buddhism.

Architecture and other features:

- The monastery is triple storied with a large assembly hall, ten other functional structures and with 65 residential quarters for students, Lamas and monks.
- The main temple in the monastery is known as the Dukhang.

10. External Affairs Minister Jaishankar to attend UNSC meetings

- External Affairs Minister S. Jaishankar will visit New York to participate in two high-level Ministerial meetings at the UN Security Council that will take up reform in the UN Security Council and the global counter-terror campaign on December 14 and 15.

About the news

- India will hold a “high-level open debate” on “**Maintenance of International Peace and Security: New Orientation for Reformed Multilateralism**” at the Security Council.
- **New Orientation for Reformed Multilateralism (NORMS)** envisages reforms in the current multilateral architecture, with the UN at its centre, to make it more representative and fit for purpose.
- The other signature event planned is the high-level briefing on the theme “**Threats to International Peace and Security Caused by Terrorist Acts: Global Approach to Counter Terrorism — Challenges and Way Forward**”, scheduled for December 15.
- Recently, India assumed the **monthly rotating presidency of the UN Security Council (UNSC) on December 1**, the second time in its two-year tenure as an elected member of the Council in 2021-22.
- India had earlier assumed UNSC presidency in August 2021.
- Both these themes have been key priorities for India during its current tenure at the UN Security Council,” the Ministry of External Affairs said in a press note.

About UNSC

- UNSC is considered the nucleus of the UN system.
- It is the only body of UN which has teeth to bite. It has a major say in all critical appointment in UN
- Chapter VI of the UN charter gives a mandate to UNSC to settle disputes peacefully through mediation and secure a ceasefire through peacekeeping force.
- Chapter VII of UN charter give power to UNSC to impose military and economic sanctions

Process of reform

- The UNSC reform requires an **amendment to the Charter of the United Nations**.
- In the first stage, the UN General Assembly must approve the reform by a two-thirds majority.
- After approval from the UN General Assembly, the amended Charter must then be ratified by at least two-thirds of the member states, including the five permanent Security Council members.
- According to Article 108 of the Charter all the permanent members of the Security Council must ratify the amendment otherwise it will not be accepted.

11. GI tag for Beypore Uru**Context:**

- The District Tourism Promotion Council, Kozhikode has applied for a Geographical Indication (GI) tag for the famous Beypore Uru (boat).

About Beypore Uru:

- It is a **wooden dhow** (ship / sailing boat / sailing vessel) handcrafted by skilled artisans and carpenters in **Beypore, Kerala**.
- It is **mainly made of Malabar teak**, probably the biggest handicraft in the world.
- Beypore urus are **purely made of wood, without using any modern techniques**, and traditional methods are used to launch this ship into the water.
- The carpenters manually join each piece of wood to build the large boat.
- Uru making in Beypore is a centuries old tradition that was established since India began its maritime trade with Mesopotamia.
- Beypore Urus are a symbol of Kerala's trade relations and friendship with the Gulf countries.
- Beypore is a town located on the banks of the Chaliyar River.
- According to records, Uru ships have been in high demand for around 2,000 years.
- The prominent people associated with Uru-making are **Odayis and Khalasis**.

Odayis:

- They manage the technical matters of ship building.
- Their family name comes from Odam (a type of small ship previously used in interactions/trade between the Malabar coast and Lakshadweep).

Khalasis:

- The Khalasis are the **traditional artisans responsible for the manufacture of the Uru.**
- They are also referred to as **Mappila Khalasis** as majority of them are **Mappila Muslims.**
- They are the ones who launch these uruses into the water, setting them ready for travel.
- Arab traders were especially enamoured of them, and were among the first major patrons of these vessels.
- It takes at least four years and the effort of over forty Khalasis to build an Uru.

Note- GI Tag already covered

12. Ban imposed by coastal States on purse seine fishing not justified, Centre tells SC

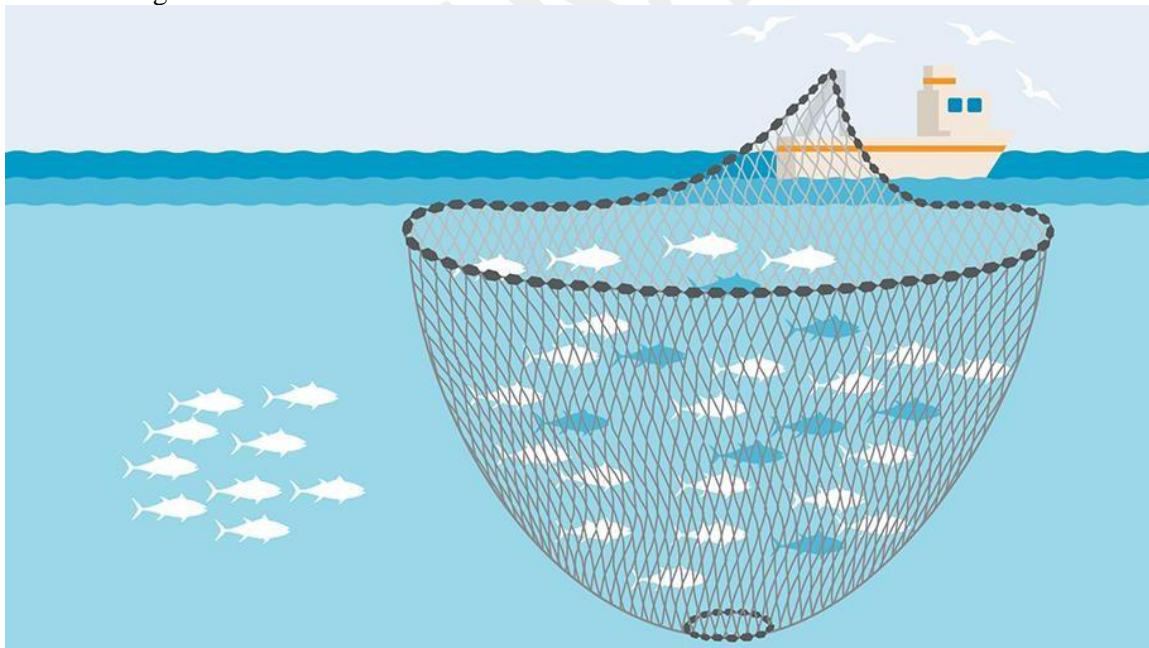
Context: The Union government has told the Supreme Court that a ban imposed by certain coastal States and Union Territories such as Tamil Nadu, Kerala, Puducherry, Odisha, Dadra and Nagar Haveli and Daman and Diu, and Andaman and Nicobar Islands on **purse seine fishing** is not justified.

About the news

- The Fisheries Department of the Union government has recommended the lifting of the ban on purse seine fishing based on a report submitted by an expert committee which has noted that this mode of fishing has not caused any serious resource depletion according to the available evidence.
- The committee also **recommended that the purse seiners can be allowed to fish in territorial waters and the Indian Exclusive Economic Zone (EEZ)** which can be subjected to certain conditions.

About purse seine fishing

- Purse seine fishing is a mode of fishing that involves the use of a wide net to draw in not only the targeted fish but also endangered species such as turtles.
- Purse seining is **a non-selective fishing method.**
- Purse seines (fishing employing a fishing net) are used in the open ocean to target dense schools of single-species pelagic (midwater) fish like tuna and mackerel.
- A vertical net 'curtain' is used to surround the school of fish, the bottom of which is then drawn together to enclose the fish.
 - The main species fished with purse seine gear are **southern bluefin tuna, Australian sardine, blue mackerel and jack mackerel.**
 - It is **not only depriving traditional fishermen of catch** but **threatening the marine ecosystem** as a whole in the region.

**13. U.K.'s Rwanda asylum seeker deportation plan is lawful, court rules**

- Britain's plan to **send migrants to Rwanda** is lawful, London's High Court ruled on Monday, in a victory for Prime Minister Rishi Sunak who has made a high-stakes political promise to tackle the record number of migrant arrivals in small boats.
- The **asylum policy** would involve Britain sending tens of thousands of migrants who arrive on its shores more than 6,400 km to Rwanda.

About Rwanda

- It is a **landlocked country in Africa**
- It lies towards **south of the equator**
- **Bordering countries:**
 - **Uganda**
 - **Democratic Republic of Congo (DRC)**
 - **Burundi**
 - **Tanzania**
 - **Kenya**



- **Important lakes:** **Lake Kivu**, one of the Great Lakes of East Africa, lies between Rwanda and the Democratic Republic of the Congo.
- **Kigali agreement** to curb the use of Hydrofluorocarbons (HFCs) was signed in capital city Kigali in Rwanda

14. US-Canada Great Lakes turning acidic: study seeks to establish details

Context: Scientists are building a **sensor network** to detect the trends in the water chemistry of **Lake Huron**, one of the five **Great Lakes of North America**. It is the first step towards developing a system that would be capable of measuring the **carbon dioxide** and **pH levels** of the **Great Lakes** over several years.

Details:

- By 2100, even the Great Lakes — **Superior, Michigan, Huron, Erie, and Ontario** — might approach acidity at around the same rate as the oceans.

Acidification of water bodies:

- Acidification of oceans or freshwater bodies takes place **when excess carbon dioxide in the atmosphere gets rapidly absorbed** into them.
- Scientists initially believed this might be a good thing, as it leaves less carbon dioxide in the atmosphere. But in the past decade or so, it has been established that **absorption of carbon dioxide leads to a lowering of the pH**, which makes the **water bodies more acidic**.
- According to the **National Oceanic and Atmospheric Administration (NOAA)** of the US government, ocean water has become 30 per cent more acidic in the past 200 years.

Consequences of acidification:

- The five lakes would **witness a pH decline of 0.29-0.49 pH units** — meaning they would become more acidic — by 2100.
- Acidification may lead to a decrease in native biodiversity, create physiological challenges for organisms, and permanently alter the structure of the ecosystem.
- It would also severely impact the **hundreds of wooden shipwrecks** that are believed to be resting at the bottom of these lakes.
- As per research, their **pH levels** had **declined three times faster in 35 years** than in oceans since the Industrial Revolution. This may result in the loss of some species.
- As a result of the **increase in acidity** the **ability of water fleas to defend** themselves against predators was compromised.

About the Great Lakes:

- The **Great Lakes** are five interconnected bodies of water straddling the **US-Canada border** that drain into the **Gulf of St Lawrence** in the **North Atlantic** through the **St Lawrence River**.

- These **five lakes** form the largest group of freshwater lakes on Earth by total area and the **second largest by total volume** containing **21%** of the world's surface freshwater by volume.
- The **US-Canada border** passes through **Lakes Superior, Huron, Erie, and Ontario** while **Lake Michigan** lies entirely in the US.
- Lakes Michigan and Huron are sometimes considered as a single water body.
 - Taken together, they are the **world's largest freshwater lake by surface area**.
- By itself, **Lake Huron** is the **world's third-largest freshwater lake**, after **Lake Superior** (one of the five lakes, and the world's largest freshwater lake) and **Lake Victoria**.



Significance of the Great Lakes:

- The **Great Lakes** are believed to have been born some 20,000 years ago, when the Earth started to warm and water from melting glaciers filled the basins on its surface.
- They contain a fifth of the world's total freshwater and are a crucial source of irrigation and transportation.
- They serve as the habitat for more than 3,500 species of plants and animals.

15. Why farmers have been urging the Centre to control the import of arecanuts

Context: The country's **arecanut farmers** are faced with an unfair challenge as **imports of cheaper varieties**, especially from **Bhutan**, flooded the domestic markets and dragged down the price of the product after the central government relaxed import restrictions.

- In **Karnataka**, about **35-40 per cent** of the crop has been affected in 2022

Minimum import price (MIP):

- **MIP** is the rate below which no imports are allowed.
- Imports without MIP or at low rates threaten domestic prices and lead them to crash.
- In September this year, the central government allowed the **import of 17,000 tonnes of green (fresh) arecanut** from **Bhutan** without a **minimum import price (MIP)**.
- Import of arecanut has taken place mostly from **Sri Lanka, Bhutan and Indonesia**.

Arecanut:

- It is a tropical crop generally known as the **betel nut**.
- It is a **palm tree species** under the family of **Arecaceae**.
- **Arecanut** is considered a **horticulture crop** in the state, a commercial crop at the national level and **dry fruit at the international level**.
- Areca nut is **not a native crop** of India.
- It was from **Southeast Asia** that the **crop spread to Asia and India** where it is cultivated as a cash crop.
- **Karnataka** produces about 80% of the arecanut in the country, followed by **Kerala and Assam**.
- **Globally, India** is the leading producer of arecanut, followed by **Bangladesh, Myanmar and Indonesia**.
- **Indonesia** is the **top exporter** of arecanut and **Thailand** is the **top importer**.
- These crops are generally impacted by **yellow leaf disease, blast disease and fruit rot disease**.
- **Central Arecanut and Cocoa Marketing and Processing Co-operative Limited or CAMPCO** is founded in **1973** for the development of these crops in **Karnataka and Kerala**.

16. What is Bomb cyclone?

Context: The storm pummeling large swaths of the United States and Canada is what forecasters call a "**bomb cyclone**." While this kind of storm is **not exceedingly rare**, this one is very strong, with high winds that are bringing heavy snow or rain to many areas.

What is Bomb Cyclone:

- A **bomb cyclone** is a large, **intense midlatitude storm** that has **low pressure at its centre**, weather fronts and an array of associated weather, from blizzards to severe thunderstorms to heavy precipitation.

Reason for its formation:

- **Storms** can form when a mass of low-pressure air meets a high-pressure mass.
- The air flows from high pressure to low, creating winds.
- In a **Bomb cyclone**, the pressure drops very rapidly in the low-pressure mass- by at least 24 millibars in 24 hours.
- This quickly increases the pressure difference, or gradient, between the two air masses, making the winds stronger.
- This process of rapid intensification has a name: **bombogenesis**.

Formation at the great lake region:

- The conditions for the formation of a bomb cyclone had been met over the **Great Lakes**, where frigid Arctic air from the meandering polar vortex met very warm air to the east.
- Air pressure dropped to at least 962 millibars, while elsewhere it was as high as 1,047 millibars.

How does a Bomb Cyclone differ from a Hurricane?

- **Hurricanes** tend to form in **tropical areas** and are **powered by warm seas**. For this reason, they're **most common in summer or early fall**, when seawater is warmest.
- **Bomb cyclones** generally **occur during colder months** because cyclones occur due to cold and warm air meetings. During the summer, there's generally not much cold air across the atmosphere; this means a **bomb cyclone** is much less likely to occur.
- **Hurricanes** form in **tropical waters**, while **bomb cyclones** form over the **northwestern Atlantic, north western Pacific** and sometimes the **Mediterranean Sea**.

17. Sarsa:

Sirsa: Rivulet associated with pivotal moment in Guru Gobind Singh's life, is dying

Context: As Sikhs across India and the rest of the world observe the **356th birth anniversary of Guru Gobind Singh**, a rivulet in north India associated with a key moment in his life is gasping for breath.

Sarsa river:

- The **Sarsa originates** in the **Shivalik hills in Himachal Pradesh**.
- It **flows** through **Solan district borders Punjab**, enters Rupnagar district in Punjab and eventually flows into the Sutlej.
- On **December 21, 1704**, a pitched battle had taken place on the banks of the **Sarsa** between **the Khalsa and Mughal armies**.
- The **Sarsa** was where the Guru's family got separated in the winter of 1704.

Pollution in river sarsa:

- The **Baddi-Barotiwala-Nalagarh (BBN) industrial complex** is spread over **380 square kilometres in the Solan district** near the **Sarsa**.
- **BBN** hosted around **500 small, medium and large pharma units** and accounted for **35 per cent** of Asia's total medicine production.
- **Pharmaceutical waste** being discharged either directly or indirectly into the **Sarsa** from the **Baddi-Barotiwala-Nalagarh (BBN) industrial complex** has affected the river's biota and made the river water unfit for human use.
- The pharma waste could also be causing the area to become **prone to antimicrobial resistance**.
- The **water of the Sirsa (or Sarsa) river**, which flows downstream through **Baddi**, is black and emanates a foul odour.

What are the guidelines to prevent pollution?

- The **Water (Prevention & Control of Pollution) Act, 1974** clearly lays down guidelines about the **penalties** to be imposed on those who are polluting water resources.
- Those who pollute water are liable for a prison sentence of up to six years under the Act.
- There is also the **Air (Prevention and Control of Pollution) Act of 1981** which has to be followed.

POLITY

1. All women bench in SC, 3rd time in history

Context: The Supreme Court will have an all-woman bench on Thursday, to hear transfer pleas and bail matters.

More details about the women bench in Supreme Court:

- The present bench comprises **Justices Hima Kohli and Bela M Trivedi**.
- This will be the **third time ever** in the Supreme Court's history that a **bench of women judges will be hearing cases**.
- The **first such instance was in 2013** when **Justices Gyan Sudha Misra and Ranjana Prakash Desai** sat together temporarily due to the absence of another judge.
- The **second such instance was in 2018**, when **Justices R Banumathi and Indira Banerjee** adorned a bench.

History of Women representation in the Supreme Court.

- **Justice M Fatima Beevi** was the first woman to be appointed as a judge of the Supreme Court in **1989**.
- The apex court currently has **only three women judges: Justices Kohli, B V Nagarathna, and Trivedi**.
- In the history of the SC, there have been only **11 women judges**.
- **Justice B V Nagarathana** will become **Chief Justice of India in 2027 for 36 days**.

Present status of Women's share in Indian judiciary:

- In high courts, the **percentage of women judges is a mere 11.5%**, while in the Supreme Court there are **three sitting women judges** out of 33 in office.
- Out of a total of **37 women candidates recommended by the Supreme Court Collegium for appointment as high court judges**, only **17 have been appointed** so far, while the rest of the names are pending with the central government.
- For the **high courts, Collegium has recommended 192 candidates** so far.
- Out of these, **37, that is 19 per cent, were women**.
- There is an abysmally low number of **83 women judges out of 680 judges in the high courts** and about **30 per cent women judicial officers** in the subordinate courts.
- Nearly 17 lakhs lawyers' practice in the country, **only 15% are women**.

2. Why constitutional validity of J&K Reorganisation Act clause went unchallenged

Context: The Supreme Court on Wednesday quizzed petitioners about the reason for not challenging the constitutional validity of a specific provision in the Jammu and Kashmir Reorganisation Act which gives the Delimitation Commission the power to "carry out" the readjustment of constituencies in the Union Territory formed after the dilution of Article 370 in the erstwhile State

What was the issue:

- A Bench of **Justices Sanjay Kishan Kaul and A.S. Oka** was hearing over the petition filed by **Srinagar residents Haji Abdul Gani Khan and Mohammad Ayub Mattoo** on challenging the **notification issued by the Centre in March 2020 establishing the Jammu and Kashmir Delimitation Commission and a second one in March 2021 extending its term** for the purpose of conducting delimitation **only for Jammu and Kashmir**.
- The Petitioners argued that **only the Election Commission under Section 60 of the 2019 Act, was empowered to conduct the delimitation exercise**.
- They further argued that **Article 170 of the Constitution barred delimitation exercise on the basis of the 2011 census**. It had to **either happen on the basis of the 2001 census or await the first census after the year 2026**.
- The petitioners **alleged that Sections 60 and 61 of the 2019 Act, which defined the role of the EC in the process of delimitation, were in contradiction to Section 62**

What was the judgement by the court:

- The court asked **why the petitioners without challenging the source of the government's notifications, that is Section 62(2), had confined their challenge solely to the notifications**

What was government response:

- The government has countered that there were **two alternative mechanisms to carry out delimitation for J&K**. By virtue of **Sections 60 and 61**, while the **power to determine delimitation was conferred on the EC, Section 62(2) and 62(3) conferred powers to carry out delimitation on the Commission**

Some important points of the J&K Reorganisation Act, 2019 regarding delimitation.

- **Sections 60 to 64 of the J&K Reorganisation Act 2019, states that the initial division of the UT of J&K into Assembly seats is the job of the EC under Section 60.**
- It further appears from **Section 62** that any readjustment in the constituencies drawn up by the EC should be taken up by a **Delimitation Commission only after the first Census done after the year 2026**.

What is Delimitation:

- Delimitation is the **act of redrawing boundaries of Lok Sabha and Assembly constituencies** to represent **changes in population** and is done on the basis of the preceding Census.
- This exercise is **carried out by a Delimitation Commission**, whose **orders have the force of law and cannot be questioned before any court.**
- **Constitutional provisions:**
 - **Article 82:** This provides the **Parliament with the authority to enact a Delimitation Act** after every Census.
 - **Article 170:** This **provides for the States to get divided into territorial constituencies as per the Delimitation Act** after every Census.
- The **Union government sets up a Delimitation Commission** once the Act is in force.

What is Delimitation Commission:

- It is **appointed by the President of India** and works in collaboration with the **Election Commission of India.**
- Its **members** are a **serving or retired Supreme Court judge, Chief Election Commissioner or an Election Commissioner nominated by CEC and Election Commissioners of the respective state.**
- Its **function** is to **determine the number and boundaries of constituencies, to identify seats reserved for SC/ST.**
- It is a **high-power body** whose **orders have the force of law and cannot be called in question before any court.**
- Delimitation Commissions have **been set up four times — 1952, 1963, 1973 and 2002** under the Acts of 1952, 1962, 1972 and 2002.

3. PADMA**Print (PADMA) digital self-regulatory news association gets government's approval****Context:**

- The government has approved the Print and Digital Media Association (PADMA) as a self-regulatory body for publishers of news and current affairs across the country.

More about Print, digital self-regulatory news association (PADMA)

- The **Print and Digital Media Association (PADMA)** will be a **self-regulatory body for publishers of news and current affairs across the country.**
- The organization **consists of 47 digital news publishers on board** and will look at **grievances related to digital media news content on their platforms.**
- The organization will be **headed by former HC Judge Mool Chand Garg** and have **part-time members from Prasar Bharati Ashok Kumar Tandon and journalist Manoj Kumar Mishra as members.**
- PDMA shall **perform functions laid down in the sub rules (4) and (5) of rule 12** for the purpose of **redressing grievances related to the code of ethics under the rules.**
- The body will also ensure that the member publishers have agreed to adhere to the provisions of the rules, including **furnishing the requisite information under rule 18,**
- **Rule 12 of the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021,** states that **self-regulatory bodies will oversee and ensure adherence by the publisher to the code of ethics; provide guidance to publishers on aspects of the code of ethics; address grievances which have not been resolved by publishers within 15 days; hear appeals filed by the complainant against the decision of publishers; issue such guidance or advisories to such publishers for ensuring compliance to the code of ethics**

What is Information Technology Rules, 2021?

- IT Rules 2021 were released under section 87 of the IT Act, 2000 for **Social-Media, Digital Media, and OTT platforms.**
- It covers **digitized content** that can be **transmitted over the internet or computer networks** and includes intermediaries such as Twitter, Facebook, YouTube.
- It also includes **publishers of news and current affairs content** and also **curators of such content over online papers, news portals, news agencies and news aggregators.**
- However, **e-papers are not covered** because **print media comes under the purview of the Press Council of India. Newspapers and TV news channels are governed under the Press Council of India Act, 1978 and Cable Television Networks Regulation Act, 1995 respectively.**
- Through the act **the digital media is brought under the ambit of Section 69(A) of the Information Technology Act, 2000** which gives **takedown powers to the government.**
- The section **allows the Centre to block public access to an intermediary in the interest of sovereignty and integrity of India, defence of India, security of the State, friendly relations with foreign States or public order** or for preventing incitement to the commission of any cognisable offence relating to above”.
- It also **deprives the intermediaries of their “safe harbour protections under Section 79 of the IT Act, 2000.**

- Safe Harbour provisions **protect the intermediaries from liability for the acts of third parties** who use their **infrastructure** for their own purposes.
- The act **provides for three Tier Check Structure part III** of the rules **imposes three-tier complaints and adjudication structure on publishers.**
 - **Level I: Self-regulation.**
 - **Level II: Industry regulatory body** headed by a **former judge of the Supreme Court and High Court** with **additional members from a panel approved by the Ministry of Information and Broadcasting.**
 - **Level III: Oversight mechanism** that includes an **inter-ministerial committee** with the **authority to block access to content**, which can also take **suo moto cognisance of an issue** and any grievance **flagged by the Ministry.**
- Social media companies are needed to appoint **Content Moderation Officers** who will be **responsible for complying** with content moderation orders.
- The New rules make it **mandatory for platforms such as WhatsApp** to aid in identifying the originator of **unlawful messages.**
- The rules mandate the **creation of a grievance redressal portal** as the **central repository** for receiving and processing all grievances.
- **Intermediaries are required to act on certain kinds of violations within 24 hours**, and on all concerns of a complainant **within 15 days.**
- The rules also hold that Information Disclosure to Competent Authorities may demand **pertinent information for the purposes of prevention, detection, investigation, prosecution or punishment of crimes.** However, it **excludes the intermediary from having to disclose the content of the personal messages.**
- The **Ministry has approved nine self-regulatory bodies** since **May 2021** under **rule 12 of the Information Technology (Intermediary Guidelines and Digital Media Ethics Code) Rules, 2021.** They include **DIGIPUB News India Foundation, Confederation of Online Media (India), and NBF- Professional News Broadcasting Standards Authority.etc.**

4. No Uniformity in parole and furlough rules across the country

Context: Lack of uniformity in parole rules does not bode well for the criminal justice system.

Concept:

- There was a huge uproar in the media when Dera Sacha Sauda chief Gurmeet Ram Rahim Singh, a convict serving a 20-year prison sentence for raping two disciples, was seen organising an online ‘satsang’ while on a 40-day parole in October.
- On the other hand, S. Nalini, a convict in the Rajiv Gandhi assassination case, who was serving life imprisonment, was given several extensions of parole from December 2021 until her release.

Parole and Furlough

- Both parole and furlough are **considered as reformatory processes.** These provisions were introduced with a view to humanising the prison system.
- The **Prisons Act, 1894, and the Prisoners Act, 1900, did not contain any specific provision** pertaining to parole and/or furlough.
- **State are empowered to make such rules:** Section 59 of the Prisons Act empowers States to make rules inter alia “for the shortening of sentences” and “for rewards for good conduct”.
- It should be noted that Prisons, Reformatory, and other associated institutions fall in the **State list of the Seventh Schedule of the Constitution.**

Parole:

- It is a system of releasing a prisoner with **suspension of the sentence.**
- The release is conditional, usually subject to behavior, and requires periodic reporting to the authorities for a set period of time.
- **Parole is not a right**, and is given to a prisoner for a specific reason, such as a death in the family or a wedding of a blood relative.
- It may be **denied to a prisoner even when he makes out a sufficient case**, if the competent authority is satisfied that releasing the convict would not be in the interest of society.
- It requires **periodic reporting to the authorities for a set period of time.** It is granted to that person who has already served a portion of his or her sentence.
- **Types of parole: Regular and Emergency or Custody parole**

Custody parole:

- It can only be given in emergency events and circumstances, such as the death of a family member, the marriage of a family member, a family member's major illness, or any other emergency situation.
- During the custody parole, the **prisoner must be escorted to and from the location of visitation** in order to ensure the prisoner's safe custody.
- Such inmates would be considered to be in prison for the duration of the sentence, and the **time would be counted as time spent in prison.**

Regular Parole

- In Regular Parole, the prisoner is released based on certain terms and conditions.
- So, the Parolee (Prisoner) must follow the rules mentioned in the Parole.
- In **Regular Parole, there are no police with the prisoner like in custody parole**, therefore it is considered discretionary parole.

Furlough

- It is similar to parole, but with some significant differences. It is given in **cases of long-term imprisonment**. The period of furlough granted to a prisoner is treated as remission of his sentence.
- Unlike parole, **furlough is seen as a matter of right for a prisoner**, to be granted periodically irrespective of any reason, and merely to enable the prisoner to retain family and social ties, and to counter the ill-effects of long time imprisonment
- The right to be released on furlough is a **substantial and legal right of the prisoner**, and it cannot be rejected if permitted by law.

Differences between Parole and furlough

S.no	Parole	Furlough
1	It is not a right of the prisoner	It is right of the prisoner
2	It is releasing a prisoner with a suspension of the sentence.	It is releasing a prisoner with remission of his sentence.
3	In the case of short-term confinement, parole may be granted.	In the case of long-term confinement, Furlough may be granted.
4	It can be granted a number of times.	There is a limitation to grant furlough.
5	Parole lasts for one month.	Furlough lasts for fourteen days maximum.
6	A specific justification is necessary.	It is to break the monotony of punishment so no justification is needed.
7	The days of leave aren't included within the sentenced period.	The sentence of convict goes along with the furlough period.
8	It is granted by the Divisional Commissioner.	It is granted by the Deputy Inspector General of Prisons.

5. Belagavi

Context: Dispute between Karnataka and Maharashtra

- Maharashtra has staked claim to over 7,000 sq km area along its border with Karnataka, comprising 814 villages in the districts of Belagavi (Belgaum), Uttara Kannada, Bidar, and Gulbarga, and the towns of Belagavi, Karwar, and Nippani.
- All these areas are predominantly Marathi-speaking, and Maharashtra wants them to be merged with the state.

What is the dispute?

- According to the State Reorganization Act of 1956, Belagavi was handed over to the Mysore state, which was renamed as Karnataka in 1973.
- In 1957, slighted by the implementation of the **States Reorganization Act, 1956**, Maharashtra demanded readjustment of its border with Karnataka.
- Maharashtra invoked Section 21 (2) (b) of the Act and submitted a memorandum to the Ministry of Home Affairs stating its objection to Marathi-speaking areas being added to Karnataka.

- The central government constituted the **Mahajan Committee in 1966** to assess the situation. Representatives from both sides, Maharashtra and the then Mysore state were part of the committee.
- In 1967, the committee recommended that some villages in Karwar, Haliyal and Suparna talukas of Karnataka be given to Maharashtra but left Belagavi with the southern state.
- In 2006, the Supreme Court held that the issue should be resolved through mutual negotiation and that linguistic criterion should not be considered as it may create more practical problems.
- The case is still being heard by the Supreme Court.

The Mahajan Commission report:

- While demarcating borders, the Reorganization of States Commission sought to include talukas with a Kannada-speaking population of more than 50 per cent in Mysore.
- Opponents of the region's inclusion in Mysore argued, and continue to argue, that Marathi-speakers outnumbered Kannadigas who lived there in 1956.
- In September 1957, the Bombay government echoed their demand and lodged a protest with the Centre, leading to the formation of the Mahajan Commission under former Chief Justice Mehr Chand Mahajan in October 1966.

Recommendations of the Commission:

- The Commission in its report in August 1967 recommended that 264 villages be transferred to Maharashtra (which formed in 1960) and that Belgaum and 247 villages remain with Karnataka.
- Maharashtra rejected the report, calling it biased and illogical, and demanded another review.

6. TRAI proposal to identify spammers

Context: The **Telecom Regulatory Authority of India (TRAI)** recently released a consultation paper for comments with respect to the introduction of a **Calling Name Presentation (CNAP) feature**.

Concept:

- The **Calling Name Presentation (CNAP) feature** would help individuals by providing information about the calling party similar to the applications such as "Truecaller" and "Bharat Caller ID & Anti-Spam".
- The main objective of introducing the CNAP feature is to ensure that telephone subscribers would be able to make informed choices about incoming calls and put a check on harassment by spam callers.

Need for CNAP

- As the subscribers are not provided with the name and identity of the caller, individuals sometimes might not answer such calls believing that it could be commercial calls from unregistered telemarketers.
- This can lead to various instances where even genuine calls are left unanswered.
- Further, concerns have been raised about robocalls (automatic calls made using IT-enabled systems), spam calls and fraudulent calls.
- As per **True caller's "2021 Global Spam and Scam Report"**, the average number of spam calls per user per month was about 16.8 in India and the total spam volumes received by its users were more than 3.8 billion calls in October alone.
- **As of now, users currently rely on in-built features or third-party applications** that present the number of the calling entity to identify spam calls.

Note: TRAI already covered in previous month

7. FIRST NATIONAL PARTY FROM NORTH-EAST

The **National People's Party (NPP)** has been recognised as the **eighth national party** by the Election Commission of India, making it the **first regional party of the north-east** to be accorded the status.

- NPP was given the national party status for fulfilling the **following conditions**:
 - In the general election to the Legislative Assembly of Arunachal, the party polled 14.55% (Polling more than 6% of the total valid votes in the last general election) of the valid votes.
 - The NPP, in addition, won five out of the sixty seats in the Legislative Assembly of Arunachal Pradesh.
 - Based on above mentioned two criteria, the party fulfilled the requirements for recognition as State Party in the State of Arunachal Pradesh.
 - Thereby, after its recognition as State party in Arunachal Pradesh, it has become a recognized State party in four States i.e. Manipur, Meghalaya, Nagaland and Arunachal Pradesh.
 - Thus, the Party fulfilled the eligibility condition for being recognized as National Party.
 - Further, as per the request of the Party, the symbol "Book" has been allotted as the reserved symbol for the 'National People's Party'.
- Before NPP's elevation, India **had seven national parties**.

○ **Trinamool Congress, led by West Bengal Chief Minister Mamata Banerjee, became the seventh in September 2016.**

- The National People's Party (NPP) was **formed in 2013** by the current Meghalaya Chief Minister Conrad K Sangma's father and former Lok Sabha Speaker, late Purno Agitok Sangma.

Benefits of National Party in India:

- Recognition as a national or a State party ensures that the election symbol of that party can't be used by any other political party in polls across India.
- Recognized 'State' and 'National' party requires only one proposer to file nomination.
- The recognized 'state' and National Parties are given two sets of electoral rolls free of cost by the Election Commission.
- In addition to this the candidates contesting on the ticket of National or state party get a copy of the electoral roll free of cost during the general elections.
- The National parties receive land or building from the government to establish their party office.
- National parties can have upto 40 star campaigners while other can have upto 20 star campaigners.
- The expenditure incurred on the travelling and other expenses of star campaigners is not included in the election expenditure of the party candidate.
- National Parties get the time slot on the national and state television & Radio to address the people and convey their message to the mass people.
- The Election Commission had amended a rule on August 22, 2016, under which it will now review the national and state status of political parties in every ten years instead of five.
- So now the status of present national and state party will remain intact till 2026
- It is observed that a lot of political parties are created to 'round trip' the black money into white. The Election Commission has the mandate to register a political party, but it can't deregister any party. The EC is demanding to get power to deregister a party. But this demand is pending with the Law Ministry.
- But the Commission had used its powers under Article 324 of the Constitution to "delist" parties for being dormant and not contesting elections for a long time.
- So, it is the need of the hour that government should take every strict action to bring out transparency in the elections.

When can a party lose its tag?

- Once recognised as a national or a state party, a political party retains that status irrespective of its performance in the next elections.
- It loses the given status only if it fails to fulfil any of the conditions for two successive Assembly and two successive Lok Sabha elections.

8. Petroleum and Explosives Safety Organization (PESO)

Context: All 50 licensing modules under the Petroleum and Explosives Safety Organisation (PESO) have been integrated into the National Single Window System (NSWS).

Details:

- These procuring licenses regulate the safety of hazardous substances such as explosives, compressed gas and petroleum.
- PESO has also developed the **System for Explosives Tracking & Tracing (SETT)** to prevent incidents of theft, diversion, pilferage of explosives from licensed agencies and consumption of explosives for illegal mining and quarrying activities.

Petroleum and Explosives Safety Organization (PESO)

- It was formerly known as **Department of Explosives**
- It is an organization under the **Department of industrial policy and promotion (DIPP)**, Ministry of commerce & industry.
- It was **established in 1898** as a nodal agency for regulating safety of hazardous substances such as explosives, compressed gases and petroleum.
- **Objective** –of ensuring safety and security of public and property from fire and explosion.
- Organisation as a **statutory authority** is entrusted with the administration of Explosives Act, 1884, Petroleum Act, 1934; Inflammable Substances Act, 1952 and the following Rules framed under these Acts.
- PESO has its **Headquarters at Nagpur in Maharashtra.**

Functions:

- Scrutiny and approval of site, layout and construction plans for –Explosives manufacturing factories, LPG bottling units etc
- Scrutiny and approval of design and construction of Explosives vans, Portable Explosives Magazines etc

- Licensing of the premises/units/vehicles mentioned as above.
- Periodic examination and testing of cylinders for grant of recognition to the cylinder testing station.
- Recognition of competent persons and inspectors under various Rules.
- Issue of shot firers permit & foreman's certificate.
- Regular inspection of the units mentioned above.
- Destruction of deteriorated and unclaimed/unserviceable/seized explosives.
- Examination of petroleum tanks in sea going vessels for issuing gas free certificates for allowing hot work, entry of man in such tanks and entry of such vessels in docks.
- Technical investigation of accidents related to the substances coming under the purview of the Acts and Rules administered by the Organisation for ascertaining causes of accident and violations.
- Scrutiny and appraisal of proposals to import, export and transport explosives for grant of licence thereof.
- Authorisation of new explosives after adequate tests and trials.
- Review & Amendment of Rules wherever necessary in Public interest.
- Examination/testing of explosives/hazardous substances for classification of hazard.
- Advising the Central and State Governments, the Industry and various Organizations on matters relating to the handling of explosives, flammable and other dangerous substances.
- The organization also monitors the entire crucial supply chain of liquid oxygen on a real-time basis from producers till the end user in an emergency such as the covid-19 pandemic.

9. Centre introduces Bills to modify ST list in four States

- The Union government has introduced **four bills that propose to make changes to the list of Scheduled Tribes (ST) in four States** namely Tamil Nadu, Karnataka, Himachal Pradesh and Chhattisgarh in Lok Sabha by making amendments to the **Constitution (Scheduled Tribes) Order, 1950**.

About the bill

- The Bill proposes to add the **Narikoravan and Kuruvikkaran** hill tribes to the ST list of **Tamil Nadu**.
- The government through another Bill sought to introduce **Betta-Kuruba** as a synonym for the already categorised Kadu Kuruba in the **ST list of Karnataka**.
- A Bill was also moved to add a number of synonyms in the Devanagari script for the already categorised **Bhariya Bhumia** tribe in the ST list of **Chhattisgarh**.
- Further, the **Hattee community** of the **Trans-Giri region** in the Sirmaur district was added to the **ST list of Himachal Pradesh**.

Definition of STs:

- **The Constitution does not define the criteria for recognition of Scheduled Tribes.**
- However, **Article 366(25)** of the Constitution only provides process to define Scheduled Tribes: "Scheduled Tribes means such tribes or tribal communities or parts of or groups within such tribes or tribal communities as are deemed under Article 342 to be Scheduled Tribes for the purposes of this Constitution."
- **Article 342(1):** The President may with respect to any State or Union Territory, and where it is a State, after consultation with the Governor, by a public notification, specify the tribes or tribal communities or part of or groups within tribes or tribal communities as Scheduled Tribe in relation to that State or Union Territory.

Process for inclusion in the ST List

- **Under article 341 (2)** of the Constitution the power to make changes to the SC and ST list **lies with the Parliament and not state legislatures**. Any change in the lists of the Scheduled Castes and Tribes **requires a constitutional amendment**.
- In the case of STs, the community must be shown to be a tribe which is isolated, and lives in vulnerable conditions. This has to be proved anthropologically.
- The process to include tribes in the ST list begins with the recommendation from the respective State governments, which are then sent to the Tribal Affairs Ministry, which reviews and sends them to the **Registrar General of India for approval**.
- This is followed by **the National Commission for Scheduled Tribes'** approval before the list is sent to the Cabinet for a final decision.

10. Bill seeks setting up of Commission to curb medical costs

- Private member bill to set up commission to regulate medical costs was introduced in Rajya Sabha.
- CPI Rajya Sabha MP P. Santhosh Kumar names the Bill as **'The National Commission for Controlling Medical Inflation Act, 2022'**.

About the bill

- The bill seeks to set up the **National Commission for Controlling Medical Inflation**, with a Chairperson, Deputy Chairperson and five other members.
- It shall have the powers of a civil court.
- The government shall consult the commission on all policies related to the control and monitoring of medical inflation.
- The proposed Commission should also be tasked with standardising the prices of essential medicines, medical diagnostic tests, pathological tests and all other relevant medical and allied services across the country in order to reduce out-of-pocket expenditure.
- It should determine an upper limit for the fee to be charged for every procedure and test, draft a national policy for the standardization of medical expenses and design a quality assurance framework.

11. Age of Consent Issue

Context: Chief Justice of India D.Y. Chandrachud on December 10, 2022 appealed to Parliament to have a relook at the issue of age of consent.

Introduction:

- Chief Justice of India D.Y. Chandrachud appealed to Parliament to have a relook at the issue of age of consent under the Protection of Children from Sexual Offences (POCSO) Act, 2012 as it posed difficulties for judges examining cases of consensual sex involving adolescents.
- In 2012, the POCSO Act raised the age of consent to 18 years, which had been at 16 years since 1940.
- A national stakeholders' consultation on the POCSO Act is being conducted by the Supreme Court's Committee on Juvenile Justice and is part of its annual stakeholders' meet.

Case for reducing age of consent:

- A study carried out by Enfold Proactive Health Trust, Bengaluru found that 93.8% of "romantic cases" tried under POCSO ended in acquittal after consuming a median time of 1.4 to 2.3 years from the filing of a First Information Report (FIR) to disposal by courts.
- The Madras High Court recently said that it was "eagerly" waiting for the legislature to reduce the age of consent under the POCSO Act from the current 18 years.
- In Sabari Vs. Inspector of Police case, the Madras High Court recommended that the age of consent be revised to 16 years.

12. Multi-State Cooperative Societies Act amendment bill introduced in Lok Sabha

Context: The Bill proposes to **amend the Multi-State Co-operative Societies Act, 2002** in light of the **97th Constitutional Amendment Act of 2011** which inserted Part IXB in the Constitution.

Key highlights of the bill:

- **Cooperative election authority:** The Bill also seeks to establish a "cooperative election authority" to bring "electoral reforms" in the cooperative sector.
- As per the proposed amendment, the authority will consist of a chairperson, a vice-chairperson and a maximum of three members to be appointed by the Centre.
- **Establishment of a Fund & concurrent audit:** The Bill seeks to insert a new Section related to the "establishment of the Cooperative Rehabilitation, Reconstruction and Development Fund" for revival of "sick multi-state cooperative societies".
- It also proposes to insert Section relating to "concurrent audit" for such multi-state societies with an annual turnover or deposit of more than the amount as determined by the Centre.
- **Complaints redress:** The government has proposed to insert a Chapter relating to "complaints redress".
- This proposes to appoint one or more "cooperative ombudsman" with a territorial jurisdiction to inquire into members' complaints.
- **Role of the ombudsman:** The ombudsman will complete the process of inquiry and adjudicate within a period of three months from the date of receiving the complaint and may issue necessary directions to the society during the course of inquiry.
- **Monetary penalties and imprisonment:** The government has also proposed to amend the existing Act to increase monetary penalties on multi-state co-op societies for violating provisions of the law to a maximum Rs 1 lakh.
- The imprisonment term has also been proposed from a maximum six months at present to up to one year in the proposed amendments.
- **Cooperative information officer:** The Centre has also proposed to make provisions for the "appointment of cooperative information officer" to provide information on affairs and management of the multi-state co-op society concerned to members of such society

About Co-operative societies

- A co-operative society is a voluntary association of individuals having common needs who join hands for the achievement of common economic interest.
- Its aim is to serve the interest of the poorer sections of society through the principle of self-help and mutual help.
- **Multi-State cooperatives:** Multi-State cooperatives are societies that have operations in more than one State — for instance, a farmer-producers organisation which procures grains from farmers from multiple States.
- The board of directors, which represents all the States where these collectives do business, is in charge of all administrative and financial decisions.
- In India, there are around 1,500 MSCSs registered, with **Maharashtra having the most.**

Is Cooperative Society in Concurrent List?

- The item "cooperative society" is **a state subject** and **falls under the Second list in the seventh schedule meaningly** that state has right to make law on and related subject matter of "cooperative society".

97th Constitutional Amendment Act 2011:

- It established the right to form cooperative societies as a **fundamental right (Article 19)**.
- It included a new **Directive Principle of State Policy on the Promotion of Cooperative Societies (Article 43-B)**.
- It added a new **Part IX-B to the Constitution titled "The Co-operative Societies" (Articles 243-ZH to 243-ZT)**.
- It authorizes the Parliament to establish relevant laws in the case of multi-state cooperative societies (MSCS) and state legislatures in the case of other cooperative societies.

Ministry of Cooperation

- The Union Ministry of Cooperation was formed in 2021, its mandate was looked after by the Ministry of Agriculture before.

13. TIPRA forms panel for ethnic and religious inclusivity

Context: The TIPRA Motha had **formed panels for ethnic and religious** inclusivity.

What is TIPRA Motha Movement:

- The TIPRA Motha is a regional tribal party formed for the movement for **Greater Tipraland**
- The parties are **demanding a separate state of 'Greater Tipraland'** for the indigenous communities of the north-eastern state.
- Among the **19 notified Scheduled Tribes in Tripura, Tripuris (aka Tipra and Tiprasas) are the largest.**
- According to the **2011 census**, there are at **least 5.92 lakh Tripuris** in the state, followed by **Bru or Reang (1.88 lakh) and Jamatias (83,000)**.
- Under **'Greater Tipraland'** envisages a situation in which the **entire TTADC area will be a separate state**. It also **proposes dedicated bodies** to secure the rights of the Tripuris and other aboriginal communities living outside Tripura.

Historical Background of the issues:

- Tripura was a **kingdom ruled by the Manikya dynasty** from the late 13th century until the signing of the Instrument of Accession with the Indian government in 1949.
- The demand stems **from the anxiety of the indigenous communities** in connection with the change in the demographics of the state, which has reduced them to a minority.
- It happened due to the **displacement of Bengalis** from the **erstwhile East Pakistan between 1947 and 1971**.
- From **63.77% in 1881**, the **population of the tribals in Tripura was down to 31.80% by 2011**.
- In the intervening decades, ethnic conflict and insurgency gripped the state, which shares a nearly 860-km long boundary with Bangladesh.
- The joint forum had also pointed out that the **indigenous people have not only been reduced to a minority, but have also been dislodged from land reserved for them** by the penultimate king of the **Manikya dynasty Bir Bikram Kishore Debbarman**.

What are the initiatives to Address the Issue?

- The Tripura Tribal Areas Autonomous District Council (TTADC) was **formed under the sixth schedule of the Constitution in 1985** to ensure development and secure the rights and cultural heritage of the tribal communities.
- The TTADC, which has **legislative and executive powers**, covers nearly **two-third of the state's geographical area**.
- The council comprises **30 members of which 28 are elected while two are nominated by the Governor**.
- Also, out of the 60 Assembly seats in the state, **20 are reserved for Scheduled Tribes**.

14. Secret Sitting in Parliament

Context: The Opposition members, who were denied the opportunity to seek clarifications in the Rajya Sabha on the

India-China stand-off, reminded the Modi Government about the 1962 India-China war, when Parliament discussed the incursions at length.

- The then Prime Minister, Jawaharlal Nehru, had **rejected outrightly the idea of holding a secret session at that time**, the Opposition said.
- Provisions relating to the **secret sitting are given in the Rules of the house.**

Secret Sitting

- **On a request made by the Leader of the House**, the Speaker shall fix a day or part thereof for sitting of the House in secret.
- When the House sits in secret no stranger shall be permitted to be present in the Chamber, Lobby or Galleries.
- **Report of proceedings**
- The Speaker may cause a report of the proceedings of a secret sitting to be issued in such manner as the Speaker thinks fit, **but no other person present shall keep a note or record of any proceedings or decisions of a secret sitting**, whether in part or full, or issue any report of, or purport to describe, such proceedings.
- The procedure in all other respects in connection with a secret sitting shall be in accordance with such directions as the Speaker may give.
- **Lifting ban on proceedings**
- When it is considered that the necessity for maintaining secrecy in regard to the proceedings of a secret sitting has ceased to exist and subject to the consent of the Speaker, the Leader of the House or any member so authorized may move a motion that the proceedings in the House during a secret sitting be no longer treated as secret.
- On adoption by the House of the motion, the Secretary-General shall cause to be prepared a report of the proceedings of the secret sitting, and shall, as soon as practicable, publish it in such form and manner as the Speaker may direct.
- **Disclosure of proceedings** or decisions of a secret sitting by any person in any manner shall **be treated as a gross breach of privilege of the House.**

15. House panel flags 'casual approach' of govt. over setting up disability Centres

Context: The Parliamentary Standing Committee on Social Justice and Empowerment has said that it feels the Union government is "somewhat casual" in setting up DDRC's.

- Only **55 to 60 District Disability Rehabilitation Centres (DDRC)** made functional so far out of the targeted **269 in designated districts.**

District Disability Rehabilitation Centres (DDRCs)

- It is an initiative by the **Ministry of Social Justice and Empowerment.**
- **Aim:** To facilitate comprehensive services to Persons with Disabilities in the rural areas.
- These units have a group of rehabilitation professions for providing services like identification of Persons with Disabilities, Awareness Generation, Early Detection and Intervention, Provision / Fitment etc.
- These centres are **run jointly by District Management Team headed by DM/Collector and a reputed NGO** (Usually Indian Red Cross Society).
- It is a joint venture **of Central and State Governments.**
- Central Government establishes the centre for three years involving funding for man power contingencies.
- State Government will provide provision basic infrastructure, furniture and coordination of activities through District Management Team (DMT) Chaired by the District Collector and also identification of implementing agency.

16. Supreme Court issues notice to Centre on plea for legal nod to same-sex union:

Context: The Supreme Court on Wednesday issued **notice on a plea by a gay couple seeking legal recognition of their marriage in India.**

More about the issue:

- The plea was filed by a 46-year-old Indian national who got **married to a US citizen in September 2010 in the US and registered their marriage in Pennsylvania, USA, in June 2014.**
- The duo's attempts to **get their marriage registered under the Hindu Marriage Act, 1955, came to a naught as the Registrar of Marriages refused to grant their request.** Moreover the **Indian embassy in Washington DC, turned down the request to register the marriage under Foreign Marriage Act, 1969.**

What is Same-Sex Marriage:

- It is the **practice of marriage between two men or between two women.**
- Same-sex marriage has been **regulated through law, religion, and custom in most countries of the world.**
- As of 2022, marriage between same-sex couples is **legally performed and recognized in more than 30 countries.** **Mexico** was the most recent country to legalise it.

What is the legality of same-sex marriages in India:

- The **right to marry is not expressly recognized** either as a **fundamental or constitutional right** under the **Indian Constitution**.
- Though marriage is **regulated through various statutory enactments**, its recognition as a fundamental right has only developed through judicial decisions of India's Supreme Court. Such declaration of **law is binding on all courts throughout India under Article 141** of the Constitution.

What are some important Supreme Court Decisions:

- In **Shafin Jahan v. Asokan K.M. and others 2018**, Supreme Court stated **Marriage as a Fundamental Right**. The right to marry is **intrinsic to the liberty** which the Constitution guarantees as a fundamental right, is the ability of each individual to **take decisions on matters central to the pursuit of happiness**.
- In **Navjet Singh Johar and others v. Union of India 2018** The Supreme Court held that **members of the LGBTQ community are entitled**, as all other citizens, to the full range of **constitutional rights** including the **liberties protected by the Constitution and are entitled to equal citizenship and equal protection of law**

What is The Special Marriage Act of 1954:

- The Special Marriage Act, 1954 is an **Act of the Parliament** of India with **provision for civil marriage for people of India and all Indian nationals in foreign countries, irrespective of religion or faith followed by either party**.
- The couples have to **serve a notice** with the relevant documents to the **Marriage Officer 30 days before the intended date of the marriage**.
- **Applicability:**
 - Any **person, irrespective of religion**.
 - **Hindus, Muslims, Buddhists, Sikhs, Christians, Parsis, or Jews can also perform** marriage under the Special Marriage Act, 1954.
 - **Inter-religion marriages** are performed under this Act.
 - This Act is **applicable to the entire territory of India** and extends to **intending spouses who are both Indian nationals living abroad**.
 - **Indian national living abroad**.

17. Bill for ST status for Gond in four UP districts got Rajya Sabha nod:

Context: The Rajya Sabha on Wednesday passed with voice vote the **Constitution (Scheduled Castes and Scheduled Tribes) Orders (Second Amendment) Bill-2022**, which seeks to **give the ST status to the Gond community** in four districts of Uttar Pradesh.

More about the bill:

- The Bill was introduced by **Tribal Affairs Minister Arjun Munda** in the Rajya Sabha.
- The Bill was **passed by the Lok Sabha in April 2022**.
- The Bill will ensure the **inclusion of the Gond community in the Scheduled Tribes list in four districts** of Uttar Pradesh i.e. **Sant Kabir Nagar, Sant Ravidas Nagar, Kushinagar and Chandauli**.

Who are Gonds?

- Gonds are one of the **largest tribal groups** in the world.
- They mostly live in **Madhya Pradesh, Chhattisgarh, Maharashtra, Andhra Pradesh, Gujarat, Jharkhand, Karnataka, Telangana, Uttar Pradesh, West Bengal and Odisha**.
- Gonds are subdivided **into four tribes**:
 - **Raj Gonds**
 - **Madia Gonds**
 - **Dhurve Gonds**
 - **Khatulwar Gonds**
- Their staple food is two kinds of millet: **kodo and kutki**.
- Gonds **believe that earth, water and air** are ruled by Gods.
- They **majorly speak Gondi** which is an **unwritten language of the Dravidian family**.

18. Corrupt Public Servant can be convicted even if proof circumstantial: SC

- Observing that courts should not show leniency towards corrupt public servants, the Supreme Court ruled that direct evidence of demand and acceptance of bribe is not necessary to prove guilt under the Prevention of Corruption Act and a person can be convicted on the basis of circumstantial evidence.

Supreme Court's Judgement

- Even if the direct evidence of the complainant is not available, owing to death or other reasons, there can be conviction of the public servant under the PCA, if the demand for illegal gratification is proved through

circumstantial evidence.

- The Bench held that a court can convict a corrupt official for demanding and accepting bribe even in a case in which witnesses, including the complainant, turn hostile and backtrack from their earlier statements that bribe was demanded.
- The Bench said the court can rely on statement of other witnesses to prove guilt.

Prevention of Corruption Act, 1988:

- The Prevention of Corruption Act, 1988 (henceforth referred to as PCA) came into force on 9th September, 1988.
- It was aimed at making anti-corruption laws more effective by widening their coverage and by strengthening the provisions to make the overall statute more effective.

Salient Features of the Act:

- It incorporates the Prevention of Corruption Act, 1947, the Criminal Law Amendment Act, 1952, and Sec. 161 to 165-A of the Indian Penal Code with certain tweaks in the original provisions.
- It has enlarged the scope of the definition such as Public Duty and Public Servant.
- It has **shifted the burden of proof from the prosecution as mentioned in the CrPC to the accused who is charged with the offense.**
- The provisions of the Act clearly state that the **investigation is to be made by an officer, not below the rank of Deputy Superintendent of Police.**
- The Act covers corrupt acts as bribe, misappropriation, obtaining a pecuniary advantage, possessing assets disproportionate to income and the like.

Prevention of Corruption (Amendment) Act, 2018:

- As the PCA saw limited success, an amendment was enacted and brought into force on 26 July 2018.
 - The Amendment Act attempted to bring the PCA in line with United Nations Convention against Corruption 2005, which was ratified by India in 2011.
- Highlights of the Amendment Act –
- **Definition of ‘Undue Advantage’**
 - The Amendment Act has defined ‘undue advantage’ to mean any gratification other than legal remuneration that a public servant is permitted to receive.
 - **Persons liable for offering a bribe to public servants**
 - Previously, the PCA did not contain a separate provision for a person who gives or promises to give an undue advantage.
 - However, the Amendment Act makes giving an undue advantage by a person to a public servant, a specific punishable offence.
 - **Offering of bribes by commercial organisations**
 - It provides that if a commercial organisation commits any of the offences listed out in the PCA with the intention to obtain or retain business or obtain or retain an advantage in the conduct of its business, then such commercial organisation shall be punishable.
 - **Prior sanction for investigation and prosecution**
 - The PCA required prior sanction of the appropriate government for prosecution of serving public officials.
 - The Amendment Act extends this protection of requirement of prior approval to investigation prior to prosecution.
 - **Attachment of Property**
 - The Amendment Act has provided for application of the Prevention of Money Laundering Act 2002 and Criminal Law Amendment Ordinance 1944 for attachment and administration of property procured by means of an offence under the PCA.
 - **Enhancement of Punishment**
 - Punishment has been increased from a minimum imprisonment term of 6 (six) months to 3 (three) years, and from a maximum of 5 (five) years to 7 (seven) years.

19. Central Bureau of Communication

- Government has spent a total of Rs 3,723.38 crore on advertisement of its policies and programmes over the past five years through **the Central Bureau of Communication**, Rajya Sabha was informed on Thursday.

About:

- The **Central Bureau of Communication** is the nodal agency of the Government of India for advertising by various Ministries and organisations of Government of India, including public sector undertakings and autonomous bodies.
- It works under the administrative control of **Information and broadcasting ministry.**
- HQ: New Delhi.
- It was set up on 8th December, 2017 by integration of three erstwhile media units of Ministry of I&B, viz namely Directorate of Advertising & Visual Publicity (DAVP), Directorate of Field Publicity (DFP) and Song & Drama

Division(S&DD), all involved in interpersonal communication.

- It undertakes campaigns to inform and educate rural and urban people about the Government's policies and programmes through available vehicles of communication viz. Print, Audio Visual, Outdoor, Digital and New Media.

Structure:

- The CBC is headed by a **Director General (DG)** with its headquarters at Sookhana Bhawan, New Delhi.
- CBC operating from Delhi, ROBs from regions and FOBs at the field level are manned by officers of Indian Information Service and Ex-cadre personnel of erstwhile DAVP (Directorate of Advertisement Visual Publicity), Directorate of Field Publicity and Song & Drama Division.

20. Directorate General Defence Estates (DGDE) to conduct survey on enemy properties

- Defence Minister Rajnath Singh said that the DGDE will start the process of survey for Custodian of Enemy Property for India (CEPI).
- The government has decided to dispose off over 9,400 enemy properties in the country, which is likely to generate about ₹1 lakh crore to the exchequer.
- A Group of Ministers, headed by Home Minister Amit Shah, was set up in 2020 to supervise selling of enemy property which is real estate left behind at the time of partition.

Background

- **After the 1965 India-Pakistan war**, the Union government enacted the Enemy Property (Custody and Registration) Order and **formed the Custodian of Enemy Property of India (CEPI) department** to look after properties left behind by the people who migrated to Pakistan or other countries with whom India has hostilities.

About enemy property:

- In the wake of the India-Pakistan wars of 1965 and 1971, there was migration of people from India to Pakistan.
- Under the Defence of India Rules framed under The Defence of India Act, 1962, the Government of India took over the properties and companies of those who took Pakistani nationality.
- These **"enemy properties" were vested by the central government in the Custodian of Enemy Property for India.**
- The same was done for property left behind by those who went to China after the 1962 Sino-Indian war.
- The **Tashkent Declaration of January 10, 1966** included a clause that said India and Pakistan would discuss the return of the property and assets taken over by either side in connection with the conflict.
- However, the Government of Pakistan disposed of all such properties in their country in the year 1971 itself.

Regulation of Enemy properties in India:

- The **Enemy Property Act, enacted in 1968**, provided for the continuous vesting of enemy property in the Custodian of Enemy Property for India.
- Some movable properties too, are categorised as enemy properties.
- In 2017, Parliament passed The Enemy Property (Amendment and Validation) Bill, 2016, which amended The Enemy Property Act, 1968, and The Public Premises (Eviction of Unauthorised Occupants) Act, 1971.
- The amended Act expanded the definition of the **term "enemy subject", and "enemy firm" to include:**
- the legal heir and successor of an enemy, whether a citizen of India or a citizen of a country which is not an enemy; and
- the succeeding firm of an enemy firm, irrespective of the nationality of its members or partners.
- The amended law provided that enemy property shall continue to vest in the Custodian even if the enemy or enemy subject or enemy firm ceases to be an enemy due to death, extinction, winding up of business or change of nationality, or that the legal heir or successor is a citizen of India or a citizen of a country which is not an enemy.
- The **Custodian, with prior approval of the central government, may dispose of enemy properties** vested in him in accordance with the provisions of the Act, and the government may issue directions to the Custodian for this purpose

21. Acid attacks: the crime, the law, regulation, and compensation:

Context: Recently a 17-year-old girl was attacked with an acid-like substance in Delhi and has once again brought back the focus on the heinous crime of acid attacks and the easy availability of corrosive substances.

What is the law on acid attacks:

- Until 2013, **acid attacks were not treated** as separate crimes.
- In 2013, after some amendments, **acid attacks were put under a separate section (326A) of the IPC** and made punishable with **minimum imprisonment of 10 years** which is **extendable to life** along with fine.
- **Punishment for denial of treatment to victims or police officers refusing to register an FIR** or record any piece of evidence.

- **Denial of treatment by both public and private hospitals** can lead to **imprisonment of up to one year and dereliction of duty by a police officer** is punishable by **imprisonment of up to two years**

What is the law on the regulation of acid sales:

- In **2013**, the SC took cognizance of acid attacks and **passed an order** on the regulation of sales of corrosive substances.
- As a result, the **MHA issued an advisory** to all states on how to regulate acid sales and framed the **Model Poisons Possession and Sale Rules, 2013 under The Poisons Act, 1919**.
- According to the MHA's directions and the model rules:
 - **Over-the-counter sale of acid is not allowed** unless the seller maintains a logbook or register.
 - The sale is also to be made only when the buyer produces a **photo ID**, to prove that he/she is above **18 years of age**.
 - **Sellers are also required to declare all stocks of acid with the concerned SDM and the SDM can confiscate the stock and impose a fine of Rs 50,000 for a breach of directions.**
 - **Educational institutions, research laboratories, hospitals, etc, are required to keep and store acid, to maintain a register of usage of acid.**

What compensation to victims of acid attacks get:

- Based on Supreme Court directions, the Ministry of Home Affairs (MHA) asked States to make sure **acid attack victims are paid compensation of at least Rs. 3 lakhs i.e Rs 1 lakh within 15 days and Rs 2 lakh within 2 months thereafter** by the concerned State Government or Union Territory as the **aftercare and rehabilitation cost**.
- **States** are supposed to **ensure that treatment provided to acid attack victims** in any hospital, public or private, is **free of cost**.
- The **cost incurred on treatment is not to be included in the Rs 1 lakh compensation given to the victim**.

22. Betta - Kuruba Tribes included in the ST list of Karnataka

Context: The Lok Sabha passed the Constitution (Scheduled Tribes) Order (Fourth Amendment) Bill, 2022 to include Betta-Kuruba in the Scheduled Tribes (STs) list of Karnataka as a synonym for the already categorised Kadu-Kuruba tribe in the State.

About Betta - Kurua Tribes

- The Betta Kuruba tribe lives in the **hilly regions of Karnataka** and is one of the few **indigenous communities of the Nilgiris**.
- They belong to the Hindu caste native to the Indian states of Karnataka, Tamil Nadu, Andhra Pradesh and Telangana.
- Traditionally, the Kuruba people **drew sustenance from hunting, gathering and collecting wild honey**.
- They practised sheep/goat and cattle pastoralism, in that they either herded exclusively sheep, or a mixed herd of sheep and goats, or cattle.
- They are generally believed to be the descendants of the Pallavas.
- Consanguineous marriages like cross-cousin marriages are preferred among the Kurumbas.

23. Bill to decriminalize minor offenses in 42 laws introduced in Lok Sabha:

Context: The government introduced the **Jan Vishwas Amendment Bill 2022**, which seeks to **decriminalize minor offenses by amending 183 provisions in 42 Acts** with a view to promoting **ease of business**.

More about the bill:

- The **Vivad se Vishwas Bill, 2020** was introduced in **Lok Sabha** by the Minister of Finance on February 5, 2020.
- The government has **taken a series of measures** to promote **ease of doing business** in the past few years.
- About **1,500 old laws** have been **repealed, 39,000 compliances have been simplified and about 3,500 norms were introduced** to decriminalize minor offenses.
- The proposal was **mooted by the Department for Promotion of Industry and Internal Trade (DPIIT)**.
- Besides the decriminalization of minor offenses, the **bill envisages**:
 - The **rationalization of monetary penalties** depending on the gravity of the offence,
 - Bolstering **trust-based governance**.
- The Acts which are being amended include the:
 - **The Drugs and Cosmetics Act, 1940**
 - **Public Debt Act, 1944**
 - **Pharmacy Act, 1948**
 - **Cinematograph Act, 1952**
 - **Copyright Act, 1957**
 - **Patents Act, 1970**

- **Environment (Protection) Act, 1986**
- **Motor Vehicles Act, 1988.**
- The other laws include the **Trade Marks Act, 1999; Railways Act, 1989; Information Technology Act, 2000; Prevention of Money-laundering Act, 2002; Food Safety and Standards Act, 2006; Legal Metrology Act, 2009; and Factoring Regulation Act, 2011.**
- These **42 laws** are **administered by various Union ministries**, including **finance, food production and distribution, financial services, agriculture, commerce, environment, road transport and highways, ports, electronics and IT.**
- The bill mentions that the **novelty involved in the proposal, increased by 10 percent** of the **minimum** amount of **fine and penalty levied**, after the **expiry of every three years.**

24. Right to repair portal

- Union Food and Consumer Affairs Minister Piyush Goyal unveiled the ‘right to repair’ portal on National Consumer Day.
- The theme of National Consumer Day 2022 was “Effective disposal of cases in consumer commission”.

About the news

- The Right to Repair refers to government legislation that is intended to allow consumers the ability to repair and modify their own consumer electronic devices, where otherwise the manufacturer of such devices requires the consumer to use only their offered services.
- The right to repair has been recognized in many countries across the globe, including the US, UK and European Union.

Background

- The Union government had set up a committee in July 2022 headed by **Nidhi Khare**, Additional Secretary, Department of Consumer Affairs to develop a **comprehensive framework for the right to repair.**
- The sectors identified include Farming Equipment, Mobile Phones/ Tablets, Consumer Durables and Automobiles/Automobile Equipment.
- The framework is an attempt to reduce restrictive practices implemented by some manufacturers in order for consumers to repair goods such as consumer durables, phones, and automobiles on their own.
- The framework will become a “game-changer” for the sustainability of the products and serve as a catalyst for employment generation.

About Right to Repair Portal:

- On this portal manufacturer will share the manual of product details with customers so that they can either repair it by themselves, or by third parties, rather than depend on the original manufacturers.
- Initially, mobile phones, electronics, consumer durables, automobiles and farming equipment will be covered.
- It allows consumers to repair and modify their consumer products against the manufacturer requiring them to use their services either by restricting access to tools and components or putting in place software barriers.
- From now on **India will be joining a clutch of countries like the US and the UK** that offer this facility.
- It will save consumers money and contribute to circular economy objectives by improving the life span, maintenance, re-use, upgrade, recyclability, and waste handling of appliances.

25. Maharashtra assembly passes bill to bring CM under Lokayukta

Context: The Maharashtra Assembly unanimously passed the Maharashtra Lokayukta Act, 2022

More about the news:

- The **Maharashtra Lokayukta Act, 2022** will give additional powers to the Lokayukta to **direct state agencies to probe public servants, including the chief minister and state ministers.**
- As per the Act, any **present or former chief minister** of Maharashtra can be investigated by the Lokayukta only if the **motion for the same is passed by the Legislative Assembly by a two-thirds majority.**
- **Approval of the governor and views of the group of ministers** appointed by the governor is required to **conduct an inquiry into present or former ministers.** Similarly, the **approval of the Council chairperson or Assembly speaker** is required to probe the **Legislative member.**
- The Lokayukta will **require approval from the minister** concerned to probe even the **municipal corporator or sarpanch.**

More about Lokpal and Lokayuktas Act 2013:

- The Act allows for the setting up of an anti-corruption **ombudsman** called Lokpal at the Centre and Lokayuktas in the state.
- **Composition:** The Lokpal will consist of a **chairperson and a maximum of eight members.**

- Chairperson should have been a **Chief Justice of India, or is or has been a judge of the Supreme Court, or an eminent person** who fulfills eligibility criteria as specified.
- **50% of the members are to be judicial members** provided that **not less than 50% of the members belong to the Scheduled Castes, Scheduled Tribes, OBCs, minorities, and women.**
- **Inquiry Wing:** Lokpal will have an Inquiry Wing for **conducting preliminary inquiry** into any offence alleged to have been committed by a public servant punishable under the Prevention of Corruption Act, 1988.
- **Prosecution Wing:** It will also have a Prosecution Wing for the prosecution of public servants in relation to any complaint by the Lokpal under this Act.
- **Powers:**
 - The Lokpal will have the **power of superintendence and direction over any investigation agency including CBI** for cases referred to them by the ombudsman.
 - As per the Act, the Lokpal **can summon or question any public servant** if there exists a prima facie case against the person, even before an investigation agency (such as vigilance or CBI) has begun the probe. Any officer of the CBI investigating a case referred to it by the Lokpal, shall not be transferred without the approval of the Lokpal.
 - An **investigation** must be completed **within six months**. However, the Lokpal or Lokayukta may allow extensions of six months at a time provided the reasons for the need of such extensions are given in writing.
 - **Special courts will be instituted** to conduct trials on cases referred by Lokpal.
- **Jurisdiction of Lokpal:** It covers a wide range of public servants — from the Prime Minister (PM), ministers and MP, to groups A, B, C, D officers of the central government including the chairperson and members of the Lokpal. However, there are some **exceptions for PM:**
 - Lokpal **cannot inquire into allegations against the PM relating to international relations, external and internal security, public order, atomic energy and space.**
 - Also, complaints against the PM are **not to be probed** unless the **full Lokpal bench considers the initiation of inquiry and at least 2/3rds of the members approve it.**
 - Such an inquiry against the Prime Minister (if conducted) is to be **held in camera** and if the Lokpal concludes that the complaint deserves to be dismissed, the records of the inquiry are not to be published or made available to anyone.
- **Selection committee:**
 - Once the search committee submits its recommendation for the Lokpal and its members, a selection committee will consider those names and forward them to the President for his consideration.
 - The five-member selection committee comprises the following — **Prime Minister (chairperson), Lok Sabha Speaker, Leader of the Opposition, Chief Justice of India and An Eminent jurist nominated by the President.**

26. Election Commission says ready to roll out pilot for migrants to vote

Context: Recently the Election Commission of India said that it has **developed a prototype** for a **Multi-Constituency Remote Electronic Voting Machine** which would enable remote voting by migrant voters.

More about the news:

- EC has developed a prototype for a **Multi-Constituency Remote Electronic Voting Machine (RVM)**.
- The RVM can handle **multiple constituencies from a single remote polling booth**.
- EC has **invited all recognized eight national and 57 state political parties to demonstrate the functioning of the RVM.**
- If the pilot is successful then in the **2024 general elections** voter portability can be fully implemented.

What is Remote Electronic Voting Machine (RVM):

- In order to enable remote voting for domestic migrants, a technological solution was proposed in the form of **Remote Electronic Voting Machine (RVM)**.
- RVM relies on the **creation of a robust electoral roll and identification mechanisms** to stop duplicate voting, and **allow voters to vote remotely, in a safe and controlled environment.**
- It was **developed** with the assistance of **Bharat Electronics Limited (BEL)** and the **Electronics Corporation of India Limited (ECIL).**
- It is based on the currently used EVM system.

How does RVM work:

- The RVMs are **stand alone, non-networked systems**, effectively providing the voter the same experience as currently used EVMs.
- They will be set up in remote locations outside the state under similar conditions as current polling booths.

- The unique feature of RVMs is that a **single Remote Ballot Unit (RBU) will be able to cater to multiple constituencies (as many as 72)** by using a **dynamic ballot display board** instead of the usual printed paper ballot sheet on EVMs.
- The **Ballot Unit Overlay Display (BUOD)** will show the requisite candidates based on the constituency number read on the voter's Constituency card.
- A **barcode scanning system** will be used to read these cards.

What will be the voting process under RVM?

- The voting process will be as follows:
 - After verifying a voter's identity, their constituency card will be read with a public display showing the constituency details and candidates.
 - This will also be displayed privately, on the BUOD in the RVM's RBU.
 - The voter will then vote and each vote will be stored constituency-wise in the control unit of the voting machine.

The VVPAT system is expected to work along the same lines with the new technology.

27. Central Board of Film Certification

Context: Censor board wants 'changes' in 'Pathaan' movie.

About Central Board of Film Certification:

- Central Board of Film Certification (CBFC) is a **statutory body** under **Ministry of Information and Broadcasting**, regulating the public exhibition of films under the provisions of the **Cinematograph Act 1952**.
- Films can be **publicly exhibited** in India **only after they have been certified by the Central Board of Film Certification**.
- The Board consists of **non-official members and a Chairman** (all of whom are appointed by Central Government) and functions with **headquarters at Mumbai**.
- It has **nine Regional offices**, one each at Mumbai, Kolkata, Chennai, Bangalore, Thiruvananthapuram, Hyderabad, New Delhi, Cuttack and Guwahati. The Regional Offices are assisted in the examination of films by Advisory Panels.
- The members of the panels are **nominated by Central Government** by drawing people from different walks of life for a period of 2 years.
- Films are **certified under 4 categories**.
 - "U" (unrestricted public exhibition)
 - "A" (restricted to adult audiences)
 - "U/A" (unrestricted public exhibition subject to parental guidance for children below the age of twelve) and
 - "S" (restricted to specialized audiences such as doctors or scientists).
- In addition to these certifications the board may also **refuse to certify**.
- **Refuse to certify --** The board's guidelines are:
 - Anti-social activities (such as violence) may not be glorified
 - Criminal acts may not be depicted
 - The following is prohibited:
 - **Involvement of children in violent** acts or abuse
 - **Abuse or ridicule of the physically or mentally handicapped**
 - Unnecessary depictions of cruelty to animals
 - Gratuitous violence, cruelty, or horror
 - No scenes encouraging alcohol consumption, drug addiction or smoking
 - **No vulgarity, obscenity, depravity, double entendres** or scenes degrading women, including sexual violence (as much as possible)
 - No denigration by race, religion or other social group
 - No promotion of sectarian, obscurantist, anti-scientific and anti-national attitudes
 - Relations with foreign countries should not be affected.
 - **No national symbols or emblems**, except in accordance with the Emblems and Names (Prevention of Improper Use) Act, 1950 (12 of 1950)

28. Karnataka carves out separate categories for Veerashaivas, Vokkaligas

Context: With pressure mounting for higher reservation in education and employment from politically influential Panchamasali (Veerashaiva Lingayat subsect) and Vokkaligas, the Karnataka government on Thursday decided to create separate OBC reservation categories.

More about news:

- The Cabinet, which met in Belagavi on Thursday, decided to **create 2C and 2D to accommodate the castes** that figured in 3A (Vokkaliga) and 3B (Veerashaiva•Lingayat) till now. The decision was based on the interim report on the demand of several communities for increase in reservation, submitted by the Karnataka State Backward Classes Commission.
- The government, however, deferred announcement on the quantum of reservation to the newly established categories till the final report of the Karnataka Permanent Backward Classes Commission is submitted, while stating that it would be increased “at least by 2% to 3%.”

Present Karnataka’s reservation policy:

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

Major communities in Karnataka:

- The **Veerashaiva Lingayats** are considered the single largest entity in Karnataka’s 6-crore population, making up **around 17%**.
- **Vokkaligas are at 15%**, Muslims 9%, and Kurubas around 8%.
- The Backward Classes block of various sub-castes minus the Kurubas make up around 25%. SCs are around 15%, and STs 3%.

Present demand:

- The **Panchamasali Lingayats** are demanding inclusion in the OBC category to be eligible **to avail 15% reservations**; and the **entire Veerashaiva Lingayat** community too, is demanding OBC categorization for 15% reservation.
- The **Vokkaligas**, who are a dominant community, are also demanding inclusion in the OBC category.

Reservation provisions in India for OBC

- The **Kalelkar Commission**, set up in 1953, was the **first to identify backward classes** other than the Scheduled Castes (SCs) and Scheduled Tribes (STs) at the national level.
- The **Mandal Commission Report**, 1980 estimated the OBC population at 52% and classified 1,257 communities as backward.
- It recommended increasing the existing quotas, which were only for SC/ST, from 22.5% to 49.5% to include the OBCs.
- The **central government reserved 27% of seats in union civil posts and services for OBCs** [Article 16(4)].
- The Constitution refers to the term ‘backward classes’ in Articles 15(4), 16(4) and 340(1).
- **Articles 15(4) and 16(4) empower** the State to make special provisions for any socially and educationally backward class of citizens
- In 2008, the Supreme Court directed the central government to exclude the creamy layer (advanced sections) among the OBCs.
- The **102nd Constitution Amendment Act**, 2018 provided constitutional status to the **National Commission for Backward Classes (NCBC)**, which was previously a statutory body under the Ministry of Social Justice and Empowerment.

INTERNATIONAL RELATIONS

1. India assume monthly presidency of UNSC

Context:

- India **assumed the monthly rotating presidency** of the **UN Security Council (UNSC)** on December 1, the **second time in its two-year tenure** as an **elected member of the Council in 2021-22**.
- India had **earlier assumed UNSC presidency in August 2021**.

What are the signature events under Indian Presidentship?

- Under India’s December presidency of UNSC, there are **two signature events** at the ministerial level, scheduled for **December 14 on Reformed Multilateralism** and **on 15 December on Counter-Terrorism**.

- India will hold a “**high-level open debate**” on “**Maintenance of International Peace and Security: New Orientation for Reformed Multilateralism**” at the Security Council.
- **New Orientation for Reformed Multilateralism (NORMS)** envisages reforms in the current multilateral architecture, with the UN at its centre, to make it **more representative and fit for purpose**.
- The **other signature event** planned is the **high-level briefing** on the theme “**Threats to International Peace and Security Caused by Terrorist Acts: Global Approach to Counter Terrorism — Challenges and Way Forward**”, scheduled for December 15.

2. Price cap on Russian oil

Context: The Group of Seven nations and Australia agreed Friday to adopt a USD 60-per-barrel price cap on Russian oil, acting shortly after the European Union reached unanimous agreement on the same price earlier in the day.

Concept:

Background:

- In the context of the Russia-Ukraine war, U.S. Treasury Secretary Janet Yellen has proposed a price cap with other Group of 7 allies as a way to limit Russia's earnings while keeping Russian oil flowing to the global economy and to limit its oil revenues.
- The European Union also decided to impose a boycott on most Russian oil, its crude that is shipped by sea.

Objective of the price cap:

- To curb Russia's ability to fund the war in Ukraine and limit the impact on global energy prices, particularly for low and middle-income countries.
- To avoid a sharp oil price spike if Russia's oil is suddenly taken off the global market.

Consequences of Russian oil price cap

- Insurance companies and other firms needed to ship oil would only be able to deal with Russian crude if the oil is priced at or below the cap. Most insurers are located in the EU or the United Kingdom and could be required to participate in the cap.
- If Russian crude were off the market that oil prices would spike, Western economies would suffer, and Russia would see increased earnings from whatever oil it can ship in defiance of the embargo.
- Russia has threatened to stop supplies to anyone participating in the plan led by the United States on the price cap of Russian crude oil.
- Russia, the world's No. 2 oil producer, has already rerouted much of its supply to India, China and other Asian countries at discounted prices. A \$60 cap would not have much impact on Russia's finances as Russian Urals blend sells at a significant discount to international benchmark Brent and fell below \$60 hence it will not affect the global price.

Impact on India

Russia has emerged as the third largest supplier to the energy import-dependent nation in FY23. India gets Russian oil at an average discount of around \$15-20 per barrel on a delivered-at-place (DAP) basis, wherein the seller bears the transportation cost, insurance and risk for delivering at the designated port.

- Shipping, freight, customs, and insurance costs are not included in the price cap and must be invoiced separately and at commercially reasonable rate
- Indian refiners are already getting Russian oil at below price cap. Even for delivered crude, India is paying \$15-\$20 a barrel below Brent.
- India is now turning to Africa and the Middle East instead of Russia due to higher freight rates by diversifying its sources in order to ensure energy security.

3. In first, Ajit Doval to host NSAs of Central Asian nations.

Context: National Security Adviser **Ajit Doval** will, for the **first time**, host a special meeting on Tuesday with his counterparts from **Central Asian countries**,

More about the meeting:

- This will be the **first time that NSAs of Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan will be in Delhi** for a **high-level security meeting**, which **focus mainly on the security situation in Afghanistan and the threat of terrorism originating from the country under the Taliban**.
- A **joint communique will be issued** after the meeting, which is expected to **outline some of the mechanisms and framework for cooperation in the security arena**.

More about the first India-Central Asia Summit:

- **India hosted the first India-Central Asia Summit** in virtual format in **January, 2022**.
- This first India-Central Asia **coincided with the 30th anniversary of establishment of diplomatic relations between India and Central Asian countries**.

- During that summit it was **agreed on regular meetings of Foreign Ministers, Trade Ministers, Culture Ministers and Secretaries of the Security Council** to prepare the groundwork for the Summit meetings.
- Moreover, it was decided that **India-Central Asia Secretariat in New Delhi** would be **set up to support the new mechanism**

4. Global South

Context:

- Indian External Affairs Minister S Jaishankar while assuming the presidency of the G20 group of countries for 2022 to 2023 said that the country would be the **“voice of the Global South”**

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 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.**

5. SAARC currency swap framework

Context: The Reserve Bank of India has signed a Currency Swap Agreement with the Maldives Monetary Authority (MMA) under the SAARC Currency Swap Framework.

Details:

This agreement will enable the MMA to make drawals in multiple tranches up to a maximum of USD 200 million from the RBI thus, funding short term foreign exchange liquidity requirements.

SAARC currency swap framework

- The SAARC currency swap facility came into operation on **15th November, 2012.**
- The RBI can offer a swap arrangement **within the overall corpus of USD 2 billion.**
- The swap drawals can be made in **US dollar, euro or Indian rupee.** The framework provides certain **concessions for swap drawals in Indian rupee.**
- The facility will be available to **all SAARC member countries,** subject to their signing the bilateral swap agreements.
 - Afghanistan, Bangladesh, Bhutan, India, the Maldives, Nepal, Pakistan and Sri Lanka are part of SAARC grouping.
- The framework is valid **from November 14, 2019 to November 13, 2022 (extended till 2022).**

Currency Swap Arrangement?

- A currency swap between two countries is an **agreement or contract to exchange currencies with predetermined terms and conditions.**
- Central banks and Governments engage in currency swaps with foreign counterparts to **meet short-term foreign exchange liquidity requirements or to ensure adequate foreign currency to avoid the Balance of Payments (BOP) crisis** till longer arrangements can be made.
- These swap operations carry **no exchange rate or other market risks** as transaction terms are set in advance.

6. India Internet Government Forum

Concept:

- The India Internet Government Forum is an initiative associated with the UN Internet Governance Forum (UN-IGF).
- The Internet Governance Forum (IGF) is a multi-stakeholder platform bringing representatives together from various groups, all at par to discuss public policy issues related to the Internet.
- India IGF (IIGF) will provide the ability to facilitate discussions between intergovernmental organisations, private companies, technical community, academic community and civil society organisations who are involved in Internet governance-related public policy issues.
- This policy dialogue is carried out on a co-equal basis through open and inclusive processes. This mode of engagement is referred to as the multistakeholder model of Internet Governance, which has been one of the key reasons for the Internet’s success.

7. World pledge USD 1 bn to Ukraine:

Context: World Leaders agreed to deliver **1 billion euros** in **fresh financial aid** for Ukraine for repair of vital infrastructure.

More about the news:

- The **gathering in Paris** extended **far beyond** the governments in **North America, Europe and East Asia** that have been mainstays of **efforts to buoy Ukraine's military, economy, government and people**.
- It included **representatives of some 50 countries**, including **Saudi Arabia, Bahrain, Turkey, Kuwait, Oman, the United Arab Emirates, Cambodia, India and Indonesia**, as well as a number of **multinational organizations**.
- The participants **pledged money and equipment** to help make **repairs** over the next few months to Ukraine's **electrical, heating, water, health care and transport systems**.
- The **aid** will be delivered between **now and the end of March**.
- The **"Paris mechanism,"** an **online platform** allowing **Ukraine to communicate its urgent needs to the donor countries** was created.
- **Warehouses** have been set up in **Poland** and several neighboring countries to **collect donations like generators, heat pumps, light bulbs and even fire trucks** that can be swiftly shuttled to devastated Ukrainian cities.

8. Five Eyes intelligence alliance:

What is Five Eyes intelligence alliance:

- The **Five Eyes (FVEY)** is an **intelligence alliance** comprising **Australia, Canada, New Zealand, the United Kingdom, and the United States**.
- The origins of the **FVEY** can be traced to **informal secret meetings during World War II** between British and American code-breakers.
- 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.

9. Iran expelled from UN women's commission:

Context; Iran has been expelled from the United Nations Commission on the Status of Women.

More about the news;

- Iran was **ousted** from the **United Nations Commission on the Status of Women** in the wake of **Tehran's brutal crackdown** of women-led protests.
- CSW is the **principal global intergovernmental body** exclusively **dedicated to the promotion of gender equality and the empowerment of women**.
- The **vote came after intense lobbying** by the **US** following widespread protests in Iran sparked by outrage against the edict compelling women to wear hijabs.
- A **simple majority** was **needed to adopt the move**, which was **opposed by 8 nations including Russia and China**.
- **India along with 15 other nations** abstained from the vote as **29 countries stood in favour of the resolution**.
- **Iran's term**, which **began this year**, was to have **run through 2026**.

What is UN Commission on Status of Women:

- The Commission on the Status of Women is a functional commission of the UN Economic and Social Council.
- It was **established by ECOSOC resolution 11(II) of 21 June 1946**.
- It **promotes women's rights, highlights the reality of women's lives throughout the world** and helps in shaping global standards on gender equality and the empowerment of women.
- **45-member states** of the **United Nations** serve as **members** of the Commission at any one time
- **India** is serving as a member of the prestigious body **for four years from 2021 to 2025**.

What are UN Women:

- UN Women is the **United Nations entity** dedicated to **gender equality and the empowerment of women**.
- It was **created In July 2010** by the **United Nations General Assembly**.
- It was **created by merging the four bodies** of the UN system:
 - **Division for the Advancement of Women (DAW)**
 - **International Research and Training Institute for the Advancement of Women (INSTRAW)**
 - **Office of the Special Adviser on Gender Issues and Advancement of Women (OSAGI)**
 - **United Nations Development Fund for Women (UNIFEM)**
- It is **headquartered** at the United Nations in **New York**

10. Urban-20

Context; Gujarat Chief Minister Bhupendra Patel on Monday **unveiled the logo, website and social media handles** of **Urban-20** or **U20 in Gandhinagar** as **part of G20** programmes to be held in the state next year.

What is Urban-20:

- Urban 20 (U20) is an **initiative developed in 2017** under the leadership of the Mayor of Buenos Aires and Mayor of Paris, and convened by the **C40 Cities Climate Leadership Group (C40)** in collaboration with **United Cities and Local Governments (UCLG)**.
- It was launched on **December 12, 2017** at the **One Planet Summit in Paris**.
- U20 **seeks to develop a joint position and collective messages** to inform and enrich the discussions of national leaders at the G20 Summit through **unique urban perspectives**.
- Urban 20 aims to **tackle global challenges by leveraging the potential of cities as hubs of diversity and innovation**.
- The U20 **brings together mayors from G20 cities** under a **common framework and coordinates a joint position** to inform the discussions of national leaders.
- **Contributions** from the U20 are **shared with the G20 Presidency and Heads of State** enhancing the role of cities as global economic and political leaders.

11. What is China's One Country Two Systems policy?

Context:

- Protests in **Hong Kong**, now in its 13th consecutive week, have brought a decades-old policy of the People's Republic of China back into focus — **One Country Two Systems**.
- **One Country Two Systems** policy means that the **Hong Kong and Macau Special Administrative Regions**, both former colonies, can have **different economic and political systems** from that of mainland China while **being part of the People's Republic of China**.

Origin of the policy:

- It was originally proposed by **Deng Xiaoping** during the 1970s.
- Deng's plan was to **unify China and Taiwan** under the **One Country Two Systems policy**.
- Taiwan rejected the Communist Party's offer of one country two systems and has since been running as a separate entity from mainland China, though Beijing never gave up its claim over Taiwan.

Resurfacing of the idea:

- The idea of two systems in one country resurfaced when Beijing started talks with Britain and Portugal, who were running Hong Kong and Macau, respectively.
- The **British had taken control of Hong Kong in 1842** after the **First Opium War**.
- In **1898**, the **British government** and the **Qing dynasty of China** signed the **Second Convention of Peking**, which allowed the British to take control of the islands surrounding Hong Kong, known as **New Territories, on lease for 99 years**.
- London promised Peking that the islands would be returned to China after the expiry of the lease, in 1997.
- **Macau**, on the other side, had been ruled by the **Portuguese since 1557**.
- They started withdrawing troops in the **mid-1970s**.
- During the transfer of territories, Beijing promised to respect the region's autonomy under the One Country Two Systems proposal.

Transfer of territories:

- On **December 19, 1984**, **China** and the **U.K.** signed the **Sino-British Joint Declaration in Beijing**, which set the terms for the autonomy and the legal, economic and governmental systems for Hong Kong post-1997.
- Similarly, on **March 26, 1987**, **China** and **Portugal** signed the **Joint Declaration on the Question of Macau** in which China made similar promises for the region of Macau after it was handed over to Beijing.
- **Hong Kong** returned to Chinese control on **July 1, 1997**, and **Macau's sovereignty** was transferred on **December 20, 1999**.
- Both regions became **Special Administrative Regions of China**.
- The regions would have their **own currencies and economic and legal systems**, but defence and diplomacy would be decided by Beijing.
- Their **mini-Constitutions would remain valid for 50 years** — **till 2047 for Hong Kong and 2049 for Macau**. It is unclear what will happen after this term.

What triggered the current crisis:

- Hong Kong's pro-democracy civil society protests against China's alleged attempts to erode the city's autonomy.
- This year, **Carrie Lam**, the **Chief Executive of Hong Kong**, proposed the **extradition Bill**, which sought to **extradite Hong Kongers to places with which the city doesn't have extradition agreements**.
- It would allow the city government to extradite Beijing critics to mainland China where the judicial system is subservient to the ruling Communist Party. This triggered the protests.



LAQSHYA 2023

TEST BASED MENTORSHIP FOR CSE PRELIMS 2023

UNION PUBLIC SERVICE COMMISSION MARKSHEET

Civil Services (PRELIMINARY) Examination, 2016	
Roll Number	0029983
Name	SANTOSH PANDEY
Marks Obtained	
Paper I	144.66
Paper II	107.50

REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION, 2016

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Santosh Sir
CRACKED ALL 6 PRELIMS

- ▶ NCERT LEVEL TEST - 11
- ▶ ADVANCED LEVEL TEST - 16
- ▶ MONTHLY CURRENT AFFAIRS TEST - 15
- ▶ ENTIRE YEAR IMP QUESTION TEST (SUBJECT-WISE) - 8
- ▶ FULL LENGTH STIMULATED TEST - 10
- ▶ C-SAT Test - 10
- ▶ TOTAL NO. OF TEST - 70

More than 70 questions in CSE PRELIMS 2022
Paper came from LAQSHYA 2022



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ECONOMY

1. Natural Gas pricing regime

Context: The Kirit Parikh committee was appointed to review the gas pricing formula.

Concept:

Natural gas pricing:

The natural gas pricing scenario in India is complex and heterogeneous in nature.

- **Formula based pricing formula/Administered Price Mechanism (APM)**
 - Much of the natural gas being produced in the country does **not command a market-determined price** — that is, it is not determined by buyers and sellers based on demand-supply dynamics in the market.
 - The price of natural gas produced from fields awarded to state-owned ONGC and Oil India regulated under the **Administered Price Mechanism (APM)**. APM gas accounts for over 90 per cent of ONGC natural gas output.
 - The **government sets the price of gas every six months**—on April 1 and October 1, each year. It is the weighted average price of four global benchmarks — the US-based Henry Hub, Canada-based Alberta gas, the UK-based NBP, and Russian gas.
 - The domestic price is based on the prices of these international benchmarks in the prior year and applies with a quarter's lag and applies for six months.
 - So, the price applicable from April 1 to September 30, 2019 is based on benchmark prices from January to December 2018.
 - APM gas has been allocated in priority to power producers and fertilisers
- **Non-APM or Free Market Gas**—two categories—domestically produced gas from Joint Venture fields and imported LNG.
 - The **pricing of JV gas** is governed in terms of the PSC (Production Sharing Contract) provisions.
 - While the **price of LNG** under term contracts is governed by the SPA (Sale and Purchase Agreement) between the LNG seller and the buyer, the spot cargoes are purchased on mutually agreeable commercial terms.
- **Differential pricing exists for different sectors**—Subsidized sectors such as power and fertilizer get relatively less prices as compared to other sectors.
- **Region specific pricing** exists in the country with North Eastern states getting gas at relatively cheaper prices as compared to other parts of the country.

Implication of formula-based pricing:

- The formula has **no mention about gas actually imported into India**— gas imported in Asian markets is costlier than many international benchmarks. In effect, **the price of domestic gas is lower than that of gas imports.**
- **The time lag of a quarter** means that the domestic gas price movement is often out

2. Q2 Data

Context: The Ministry of Statistics and Programme Implementation (MoSPI) released India's economic growth data for the second quarter of the current financial year (2022-23 or FY23).

Details:

- **The second quarter or Q2** refers to the months of **July, August and September.**

Indicators	Q2 on a year-on-year basis
Gross Domestic Product	6.3 per cent
Gross Value Added (or GVA)	5.6 per cent
The GDP (at Rs 38,16,578 crore) is much higher than the GVA (which is at Rs 35,05,599 crore).	

- **Decline in sectors crucial for job creation:**
 - Contraction in the **manufacturing sector** – 4.3% in th Q2.
 - Growth in **services** is barely over 2 per cent.
 - **Mining and quarrying** have contracted by almost 3%.
- GVA in **agriculture** (along with forestry and fishing) grew at 4.6%.
- **On the GDP side**

- The biggest engine of growth is **private consumption expenditure**- 55% of India's total GDP.
- Expenditures towards **investments** are the second biggest contributor to the GDP-33 per cent. It has grown by 10.4% over FY21 and by almost 21% between FY20 and FY23.
- There has been a **contraction in government final consumption** expenditures- 10-11% of the GDP. It contracted by 4.4% per cent in Q2 and is 20% below the pre-Covid level.
- **Net exports**- since India imports far more than it exports, the NX value is negative. In Q2 it increased by 89 per cent.

Indicates?

The economy has picked up momentum since the pandemic, but the contraction in the manufacturing sector, higher interest rates and no sharp rise in consumption will pose challenges in the second half of the current financial year.

Concept:

What do GDP and GVA mean?

- GDP and GVA are the two main ways to ascertain the **country's economic performance**.
- Both are measures of national income.
- The **GDP** measures the monetary measure of all "final" goods and services— those that are bought by the final user— produced in a country in a given period.
- The GDP does this by adding up the **total expenditures** in the economy. That is why GDP captures the total "**demand**" in the economy.
- **Components:**
 - All the money Indians spent for their private consumption -**Private Final Consumption Expenditure or PFCE**.
 - All the money the government spent on its current consumption, such as salaries -**Government Final Consumption Expenditure or GFCE**.
 - All the money spent towards investments to boost the productive capacity of the economy. This includes business firms investing in factories or the governments building roads and bridges-**Gross Fixed Capital Expenditure**.
 - The net effect of exports (what foreigners spent on our goods) and imports (what Indians spent on foreign goods)-**Net Exports or NX**.
- The **GDP data is more useful** when looking at annual economic growth and when one wants to compare the economic growth of a country either with its growth in the past or with another country.
- The **GVA calculates** the same national income from the supply side.
- It does so by adding up all the **value added across different sectors**.
- The GVA of a sector is **defined as the value of output minus the value of its intermediary inputs**.
- This "value added" is shared among the primary factors of production, labour and capital.
- By **looking at the GVA growth** one can understand which sector of the economy is robust and which is struggling. When one is looking at quarterly data, it is best to **look at GVA data**.

How are the two related?

- The **GDP is derived** by looking at the GVA data.
- **GDP = (GVA) + (Taxes earned by the government) — (Subsidies provided by the government)**

3. Animal spirit

Context: Uday Kotak has requested big companies to increase investments

What is animal spirit?

The term animal spirit was innovated by John Maynard Keynes and it indicate the internal urge for action by business people and consumers to engage in more investment and consumption. Hence animal spirit is the psychological urge to get into more economic activities by investors and consumers.

Keynes explains the concept in this book General Theory: "Most, probably, of our decisions to do something positive, the full consequences of which will be drawn out over many days to come, can only be taken as the result of animal spirits – a spontaneous urge to action rather than inaction."

What is the significance of animal spirit in overcoming recession?

Most important aspect about animal spirits is that it is economic optimism and confidence that drives investors to make more investment even when there is uncertainty. This means that even if the economic environment is not good, if animal spirits is activated, higher investment can occur. In recent years, animal spirit is frequently used because increased investment is necessary to rejuvenate economies from recession.

4. Financially Sound and Well Managed (FSWM) banking entities

Context: Reserve Bank of India prescribed revised norms to categorise UCBs as Financially Sound and Well Managed (FSWM) banking entities and announced a four-tiered regulatory framework

Details:

- The **four-tiered regulatory framework** is based on the size of deposits of the UCBs.
 - The extant regulatory framework classifies UCBs into two tiers — Tier I and Tier II.
- **Four- tier Categorization:**
 - **Tier 1**-UCBs deposits up to Rs 100 crore.
 - **Tier 2**-UCBs with deposits more than Rs 100 crore and up to Rs 1,000 crore.
 - **Tier 3** -UCBs with deposits more than Rs 1,000 crore and up to Rs 10,000 crore.
 - **Tier 4**-UCBs with deposits more than Rs 10,000 crore.
- If a UCB transits to a higher Tier it may be provided a glide path of up to a maximum of three years to comply with higher regulatory requirements.
- **Net worth and capital adequacy requirements** of the UCBs:
 - **Tier 1 UCBs** operating in a single district-minimum net worth of Rs 2 crore.
 - **For all other UCBs**- the minimum net worth should be Rs 5 crore.
 - **Tier 1 UCBs**- minimum capital to risk weighted assets ratio of 9 percent of Risk Weighted Assets (RWAs).
 - **Tier 2 to 4 UCBs** -a minimum capital to risk weighted assets of 12 percent of RWAs on an ongoing basis.
- **For categorising UCBs as FSWM category banks:**
 - **The capital adequacy ratio**- at least one percent above the minimum CRAR applicable to an UCB.
 - **Net non-performing Assets (NPAs)** -not be more than three per cent.
 - **Reported Net profit** for at least three out of the preceding four years.
 - Not have incurred a **net loss** in the immediately preceding year.
 - Not have defaulted on maintaining **Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR)** during the preceding year.
 - It should have a sound **internal control system** with at least two professional directors on the board and fully implemented core Banking Solution (CBS).
 - **No monetary penalty** should have been imposed on the bank for violation of RBI's directives and guidelines during the last two financial years.
- **Process of categorizing UCBs as Financially Sound and Well Managed (FSWM) banking entities**
 - UCBs can **decide the eligibility** based on the assessed financials and findings of RBI inspection report or audited financial statements, whichever is latest.
 - The **boards of the banks** have to examine the compliance with the FWSM criteria and pass necessary resolutions and inform RBI immediately.
 - UCBs may **review the compliance** with FSWM criteria every year at Board level immediately after the audit of the financial statements and RBI inspection report as and when received.
 - This process will be **subject to supervisory review** of RBI.

Note- Co-operative banks already covered

5. Third-party application provider (TPAP)

Background:

- NPCI in 2020 came up with a directive to cap the share of transactions a third-party application provider (TPAP) could process at 30 per cent of the volume of transactions handled on UPI, effective January 1, 2021, which is to be calculated on the basis of the volume of transactions processed during the preceding three months.
- The NPCI had proposed a 30 per cent volume cap for third-party app providers (TPAP). Currently, there's no cap on volume and Google Pay and PhonePe hold the market share of about 80 per cent.
- The timelines for compliance of existing TPAPs who are exceeding the volume cap, is extended by two (2) years i.e. till December 31, 2024 to comply with the volume cap

Third-party application provider (TPAP)

- TPAPs refer to (API) are either standalone applications or applications that add functionality to an existing parent program / system.
- The UPI ecosystem is designed for banks. Only a banking entity can directly interact with the UPI switch. However, non-banking entities can participate by partnering with a banking entity which is already on UPI platform, and developing their own APIs referred to as third party apps.
- The role of these entities is more in the nature of facilitator for transactions as the entire operational and financial liability of transactions originated through third party app lies on the bank. There are over 20 TPAPs (eg., Google Pay, WhatsApp etc.) in UPI.

- A third-party app sends a request to the linked banking application for permission to access the user's bank details, which is further relayed by the banking application to the customer to authenticate the request.
- These apps provide flexibility and freedom to consumers to select solutions they find most convenient to meet their financial needs. This architecture balances regulatory safety and innovation as it combines the safety and trust of banking institutions with the informality and convenience offered by non-banks.
- In the payment space, third party service providers are primarily in the form of payment gateways, payment aggregators and TPAPs in UPI.
- Leveraging further on the system, a multi-bank model has been introduced for large TPAPs which allows them to tie-up with multiple banks to act as PSPs. As in the case of single bank model, the TPAPs provide only customer interface, while the transactions continue to be processed through the underlying PSP bank.

6. Telecom imports under lens

Context: The government will devise a methodology to check imports from neighbouring nations that are noncompliant with trusted source rules of the telecom sector, Minister for Communications and IT Ashwini Vaishnaw said on Saturday.

Concept:

- India imports most of its Telecom equipment from China, South Korea and United States and is the largest importer of Telecom equipment in the World.
- The top 3 importers of Telecom equipment are India with 99,029 shipments followed by South Korea with 15,933 and Hong Kong at the 3rd spot with 13,409 shipments.
- Top Product Categories of Telecom equipment Imports in India are machines for the reception conversion and transmission or regeneration of voice images or other data including switching and routing apparatus and populated loaded or stuffed printed circuit boards

Steps taken:

- **Telecom Regulatory Authority of India (TRAI)** has recommended the setting up of a Rs. 1,000 crore fund for promoting research and innovation in the sector. India should aim at net zero imports of telecommunications equipment by 2022.
- The Union Cabinet has approved the Production-Linked Incentive (PLI) scheme for the telecom sector with an outlay of Rs. 12,195 crores over five years.
- A task force has been set up for creating the component ecosystem. Another task force has been set up for developing 45 chips, then taking those chips from design to production. A third task force has been set up to develop highly skilled workers, designers in the telecom sector

7. Universal Safety Oversight Audit Programme Continuous Monitoring Approach (USOAP CMA)

Context: India jumps to 48th place in ICAO aviation safety ranking

Details.

- India is now at the **48th position**, a "quantum leap" from the 102nd rank it had in 2018.
- The Directorate General of Civil Aviation (DGCA) got the **highest Effective Implementation (EI) score** of 85.49 per cent.
- The rankings are for 187 countries.
- Under ICAO's Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach—an ICAO Coordinated Validation Mission (ICVM) was undertaken from November 9 to 16.
- **Other countries' ranking**
 - Singapore-1st
 - UAE-2nd
 - Republic of Korea-3rd
 - France-4th
 - Georgia-48th (along with India)

Concept:

International Civil Aviation Organisation

- ICAO was created in **1944 by the Chicago Convention** in order to promote the safe and orderly development of civil aviation around the world.
 - **The Chicago Convention** established the core principles permitting international transport by air, and also led to the creation of the ICAO
- The International Civil Aviation Organization (ICAO) was established to manage the administration and governance of the Convention on International Civil Aviation (Chicago Convention).
- ICAO is a **United Nations (UN) specialized agency**.

- Its **objective** is to foster the planning and development of international air transport so as to ensure the safe and orderly growth of international civil aviation throughout the world.
- India is among its **193 members**.
- It is headquartered in **Montreal, Canada**.
- The ICAO laid the foundation for the standards and procedures for **peaceful global air navigation**.
- It works to reach a consensus on the **Standards and Recommended Practices (SARPs)** and policies for international civil aviation.
 - These SARPs and policies are used by ICAO Member States to ensure that their local civil aviation operations and regulations conform to global norms, which in turn permits more than 100,000 daily flights in aviation's global network to operate safely and reliably in every region of the world.
- The ICAO is governed by the ICAO Council, which is headed by a President.

Universal Safety Oversight Audit Programme Continuous Monitoring Approach (USOAP CMA)

- The International Civil Aviation Organisation (ICAO) Universal Safety Oversight Audit Programme (USOAP) was established in **1999**.
- It aims to **promote global aviation safety**.
- It is done through **regular audits** of ICAO Member States to determine their ability to maintain their safety oversight systems.
- This enables the State to **ensure the implementation of ICAO's safety-related Standards and Recommended Practices (SARPs)** and associated procedures and guidance material.
- In addition, it provides ICAO with a means to **continuously monitor the States' fulfillment of their safety oversight obligations**.
- The programme is **managed by** the Monitoring and Oversight office within the Air Navigation Bureau.

8. Digital Markets Act

Context: The fifth edition of the EU-India Competition Week held at CCI headquarters in New Delhi.

Concept:

- In 2013, CCI and Directorate General for Competition (DG COMP) of the European Commission signed a Memorandum of Understanding (MoU) for technical cooperation that has provided a platform for dialogue and exchange of best practices between EU and India.
- It highlighted that topics related to application of antitrust laws to the digital economy/markets, introduction of the EU's Digital Markets Act etc

About Digital Markets Act

- It applies to the **'gatekeepers'** in the online space. These companies will have to **comply with the new rules**.
- The Digital Markets Act (DMA) entered into force in the **European Union (EU) on November 1 2022**.
 - It introduces quantitative **thresholds and penal provisions** to keep a check on large digital platforms.
 - It opens up possibilities of an equal **market** – based on the merits of their products and services.
 - As for consumers it ensures **access to a wider array of options as well as a lower price** of services by enforcing competition and de-exclusivities.
- The Act designates companies with sizeable dominance in any of the **'core platform services'** as **'gatekeepers'**.
 - These services include app stores, online search engines, social networking services, certain messaging services, video sharing platform services, virtual assistants, web browsers, cloud computing services, operating systems, online marketplaces and advertising services.
- What is the quantitative **threshold to be deemed a 'gatekeeper'**?
 - an annual turnover of at least €7.5 billion within the EU in the past three years, or a market valuation of at least €75 billion
 - over 45 million monthly end-users
 - at least 10,000 business users established in the EU.
- The rules state that users will have the **right to choose and install their apps** and will not be forced to use software by default when installing the OS and web browsers.
- It provides "interoperability" --mean that a user on WhatsApp and one on iMessage should be able to talk to each other
- **Obligations on gatekeepers:**
 - Gatekeepers must "allow the installation and effective use of third-party software applications or software application stores".
 - Gatekeepers cannot establish unfair conditions for business users or require app developers to use certain services in order to be listed in app stores.
 - Gatekeepers will have to give sellers access to their marketing or ad performance data on the platform.

- The gatekeepers will have to inform the European Commission of their acquisitions and mergers.
- The new rules also forbid the gatekeepers from ranking their own products or services higher than others, and from reusing private data collected during a service for the purposes of another service.
- A proportionate subset of obligations for a non-gatekeeper, attains the stipulated threshold in the future to prevent them from acquiring the same ‘gatekeeper dominance’ by unfair means.
- What happens when **rules are violated**?
 - Violators can be fined up to 10 percent of the company’s global annual sales, rising to 20 per cent for repeated infringements.
 - In worst case scenarios, they could even be banned from any further acquisitions

9. Offences under GST

Context: The Goods and Services Tax (GST) Council meeting is likely to discuss decriminalization of offenses under GST law.

Concept:

Prosecution under GST-Prosecution is the conducting of legal proceedings against someone in respect of a criminal charge.

Offences liable for prosecution

Any person committing the following offences (i.e., deliberate intention of fraud) becomes liable to prosecution, i.e., face criminal charges.

- Supplies any goods/services without an invoice in order to evade tax
 - GST officers can launch prosecution against GST offenders in cases where the **amount of evasion or misuse of input tax credit is more than ₹5 crore.**
- Issues any invoice without supplying any goods/services- thus taking input credit or refund by fraud
- Collects any GST (even if in contravention of provisions) but does not submit it to the government within 3 months.
- Obtains refund of any CGST/SGST by fraud.
- Submits fake financial records/documents or files fake returns to evade tax
- Obstructs the proper officer during his duty (for example, he hinders the officer during the audit by tax authorities)
- Acquires/receives any goods/services with full knowledge that it is in violation of GST rules and is liable for confiscation
- Destroys any evidence
- Does not provide information/gives false information during proceedings
- Helps any person to commit fraud under GST

Punishment:

The person committing any of the offences above shall be **punished as follows**:

- Tax amount involved between 100-200 lakhs– bailable and jail term up to 1 year
- Tax amount involved between 200-500 lakhs- bailable and jail term up to 3 years
- Tax amount involved between above 500 lakhs-bailable and jail term up to 5 years

Compounding:

- GST Act also allows for compounding of offences.
- Compounding of offences is a shortcut method to avoid litigation.
- In compounding, the accused is not required to appear personally and can be discharged on payment of compounding fee.
- The amount payable for compounding of offences shall be **50% of the tax involved subject to a minimum Rs. 10,000.** Maximum amount for compounding is 150% of the tax or Rs. 30,000 -Whichever is higher.
- Compounding will be allowed only after payment of all tax, interest and penalty dues.

Arrest under GST:

- **Section 69 in the Central Goods and Service Tax (CGST) Act** gives power to authorities to arrest any person if there is “reason to believe” that he has committed tax evasion.
 - A person under the CGST Act can only be arrested, if the **amount of tax evasion is more than ₹2 crore.**
 - All offences in which tax evasion is **less than ₹5 crore are bailable** and only grave offences involving tax evasion of **₹5 crore and above are non-bailable and cognisable.**

10. National Single Window System

Context:

PAN could become a single ID for investment approvals.

Details:

Investors may soon no longer have to fill in multiple identity details for accessing the National Single Window System for project-related clearances and approvals.

Concept:

National Single Window System?

- The platform was soft launched in **September 2021** by the **Ministry of Commerce and Industry**.
- It is a **one-stop digital platform that aims at allowing investors to apply for various pre-operations approvals** required for commencing a business in the country.
- It makes the business registration process easier, allowing the beneficiary to get significant approvals online, without having to run to the government offices for approvals and can avail themselves of services with just a click.
- The portal hosts applications for **approvals from 26 Central Departments and 16 State Governments**.
- These approvals can be applied through NSWS.
- The National Single Window System (NSWS) is a **digital platform for guidance**
 - Central Approvals
 - State Approvals
 - Government Schemes
- The platform is built to serve as an advisory tool to identify approvals based on user input and is to be used for guidance purpose only.
- **Services includes:**
 - All approvals in one place
 - Real-time status tracking
 - Secure document repository
 - Easy renewal
 - Fast query management
 - Know your approvals

Permanent Account Number:

- The PAN is a **10-digit alphanumeric number** allotted by the tax department to an individual, company or entity.
- PAN card comes in a **tangible form** in that the specific PAN number is assigned, including Organization Name, DOB, and a photo that can also be provided as identification proof and for several other regulatory standards.
- The PAN card provides the **following pieces of information:**
 - Individual's Name
 - Name of the applicant's father
 - The applicant's Birth Date and Registration date with the appropriate authority in the case of non-individuals.
 - PAN number
- **Importance of PAN Card**
 - PAN number is required to prove identity and file an income tax return.
 - For bank purposes such as opening an account, getting a loan or credit card, etc., a PAN number is required.
 - A PAN is an essential document for selling or purchasing a property worth more than five lakh.
 - PAN number is necessary when buying or selling automobiles, etc.

11. RBI increases key lending rate by 35 bps

RBI increases key lending rate by 35 bps Cuts FY23 GDP Growth Projection to 6.8%

Context: The Monetary Policy Committee (MPC) of RBI increased key interest rates by 35 basis points.

More about news:

- The Reserve Bank of India (RBI) on Wednesday **raised the benchmark lending rate by 35 basis points (bps) to 6.25%**, the **fifth increase** since May.
- Consequently, **the standing deposit facility (SDF) rate is adjusted to 6%** and the **marginal standing facility (MSF) rate and Bank rate to 6.50%**.
- It **lowered its estimate of GDP growth to 6.8%** in the fiscal **ending March 31, 2023**, from an **earlier forecast of 7%**
- The MPC kept the **inflation forecast unchanged at 6.7%** for the **current fiscal** and **projected** it to come down below the **upper tolerance limit of 6% in the fourth quarter of the current financial year**.
- The MPC also **decided to remain focused** on the **withdrawal of the accommodative stance** to ensure that inflation remains within the target going forward while supporting growth.

Note: Basic Concepts and MPC already covered

12. IRDAI opens bancassurance floodgates for all insurers

- **Insurance regulator IRDAI** has now widely thrown open the bancassurance channel for insurers as part of its overall effort to increase insurance penetration in the country.
- Also, to achieve the long-term goal of ‘insurance for all’ by 2047, when the country will celebrate its golden jubilee of independence.
- Each bank can now have distribution tie up with as many as 9 life insurers, 9 general insurers and 9 health insurers.

About Bancassurance

- Bancassurance or Bank Insurance Model refers to the **distribution of the insurance and related financial products by the Banks** whose main business is NOT insurance.
- So, simply Bancassurance, i.e., banc + assurance, refers to banks selling the insurance products. This partnership arrangement can be profitable for both companies.
- Bancassurance term **first appeared in France in 1980**, to define the sale of insurance products through banks’ distribution channels.
- Banks earn additional revenue by selling insurance products, and insurance companies expand their customer bases without increasing their sales force.
- For Bancassurance, the **Banks need to obtain a prior license from the IrDA or Insurance Regulatory and Development Authority**, so that they can work as “Composite Corporate Agent” or may have “Referral Arrangement” with the Insurance Companies.
- **RBI Guidelines:** As per the Government of India Notification dated August 3, 2000, specifying ‘Insurance’ as a permissible form of business that could be undertaken by banks under Section 6(1)(o) of the Banking Regulation Act, 1949.

Models of Bancassurance

Referrral Model

- Here, Bank will give office space to the insurance company in its branches.
- The insurance staff will sit in the bank branch and sell its products to bank customers.
- Bank staff doesn’t participate in selling.
- Bank faces no risk. Insurance company pays fixed-fees for using the office space.

Corporate Agent Model

- Bank ties up with one life, one non-life and one health insurance company. For example:
- Majority of banks follow this model.
- Bank sells policies of only one insurance company= customer is deprived of ‘choice’, even if other insurance companies are offering better alternatives.
- Bank is not liable to customer.

Broker Model

- Bank sells policy of multiple insurance companies under one roof. (multiple life insurance companies, multiple general insurance companies, multiple health insurance companies.)
- Bank earns commission according to sales-agreement with individual company.

13. Export cooperative bodies

Context:

A conference to commemorate the 100th International Day of Cooperatives was held at Vigyan Bhavan.

Major announcements

The Centre will set up a National Cooperative Export Society to help enhance exports.

Primary Agriculture Credit Societies may be allowed to sell petroleum products, run PDS shops.

Computerisation of Primary Agriculture Credit Societies will be undertaken.

Concept:

- In 2019, the Union government has set up the **Cooperative Sector Exports Promotion Forum (CSEPF)** under the **National Cooperative Development Corporation (NCDC)** to assist farmers export their products.
 - **National Cooperative Development Corporation** was established by the **National Co-operative Development Corporation Act, 1962** as a statutory Corporation under the **Ministry of Agriculture & Farmers’ Welfare**.
 - The NCDC has the unique distinction of being the **sole statutory organisation functioning as an apex financial and developmental institution** exclusively devoted to the cooperative sector.
 - The **objectives of NCDC** are planning and promoting programmes for agricultural produce, foodstuffs, industrial goods, livestock and certain other notified commodities and services on cooperative principles.
 - The Corporation promotes, strengthens and develops the farmers’ cooperatives for increasing production and productivity and instituting post-harvest facilities.

- The Corporation's focus is on programmes of **agricultural marketing and inputs**, processing, storage, cold chain and marketing of agriculture produce and supply seeds, fertilizer and other agricultural inputs etc.
- In the **non-farm sector**, the Corporation's endeavour is to equip cooperatives with facilities to promote income-generating activities, with a special focus on weaker sections such as dairy, livestock, handlooms, sericulture, poultry, fishery, scheduled caste & scheduled tribes, women cooperatives etc.

Primary Agricultural Credit Societies.

- It is a village-level institution that works directly with rural residents.
- It encourages agriculturists to save, accepts deposits from them, makes loans to deserving borrowers, and collects repayments.
- PACS are the **lowest unit in a three-tier structure**: The other two tiers — State Cooperative Banks (StCB) and District Central Cooperative Banks (DCCB).
- **Organisational Structure of PACS**
 - **General Body of PACS**: Exercise the control over board as well as management.
 - **Management Committee**: Elected by the general body to perform the work as prescribed by the society's rules, acts, and by-laws.
 - **Chairman, Vice-Chairman, and Secretary**: Work for the benefit of the members by performing their roles and duties as assigned to them.
 - **Office Staff**: Responsible for performing day to day work.

14. RBI rule on loan securitisation

Context: Reserve Bank of India (RBI) issued new guidelines prohibiting securitization of loans with a residual maturity of less than a year.

Details:

Prohibiting short-term securitization would affect about 5% of the market, especially the gold loan financiers and microfinance institutions (MFI).

Concept:

- **Securitization** is the pooling of assets into repackaged interest-bearing securities.
- The Reserve Bank of India (RBI) formulated guidelines in 2006 for governing **securitisation of standard assets**.
 - **Standard assets (or performing assets)** -assets where amounts due have not been outstanding for more than 90 days.
 - The regulatory framework provided in the guidelines **covers securitisation of standard assets** by banks, All India Term Lending and Refinancing Institutions, and Non-Banking Financial Companies (including RNBCs).
 - Securitisation follows a **two-stage process**:
 - In the first stage there is sale of single asset or pooling and sale of pool of assets to a 'bankruptcy remote' special purpose vehicle (SPV) in return for an immediate cash payment
 - In the second stage repackaging and selling the security interests representing claims on incoming cash flows from the asset or pool of assets to third party investors by issuance of tradable debt securities.
 - The Securitisation Guidelines prescribe a **minimum retention requirement** of 5 per cent to 10 percent of the assets being securitised.
 - The assets are **held on the books** of the originator for a minimum period prior to securitisation.
 - The Securitisation Guidelines stipulate certain **assets that cannot be securitised**, including securitisation exposures, revolving credit facilities and loans with bullet payment.
- The Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 deals with resolving, restructuring and **securitisation of non-performing assets (NPAs)**.
 - Section 5 of the **Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002**, mandates that only Banks and financial institutions can securitise their financial assets.

Central Registry of Securitisation Asset Reconstruction and Security Interest of India-CERSAI

- It has been established as a company under **section 8 of the Companies Act, 2013 by the Government of India**.
- The object of the company is to **maintain and operate a Registration System** for the purpose of registration of transactions of securitisation, asset reconstruction of financial assets and creation of security interest over property, as contemplated under the Securitisation and Reconstruction of Financial Assets and Enforcement of Security Interest Act, 2002 (SARFAESI Act).

- CERSAI was formed to **identify and check fraudulent activity in lending transactions against equitable mortgages** i.e to discourage and prevent the practice of taking out various loans from several banks using the same asset or property.
- **Major shareholders**-51% by the Central Government and rest by select Public Sector Banks and the National Housing Bank.

15. Anonymity in rupee transaction

Context: Reserve Bank of India (RBI) has said the e-Rupee transactions are anonymous, on-ground implementation is not clear on this front.

E Rupee and anonymity

- The person making the payment and the one receiving it will **get an SMS from the respective banks** whose e-Re apps are used for the transaction.
- Issuing such messages is presently mandatory under the law for any digital transaction and e-Re is no exception and the bank **which is issuing the message has the transaction trail.**
- While the wallet-to-wallet transactions are said to be anonymous.
- But when a user is transferring money into the wallet or removes money from the wallet to his/her bank account, these transactions reflect on the bank statement of the user.

Anonymity in cash holdings:

- The Central Board of Direct Taxes (CBDT) in 2022 by amending the Income Tax Rules, 1962 made **PAN or Aadhaar mandatory:**
 - **Cash deposit or withdrawal exceeding ₹20 lakh** in one or more bank accounts or the post office in a financial year.
 - This requirement also covers deposits and withdrawals from **cooperative banks.**
 - The ₹20 lakh threshold is for the aggregate of all deposits or **aggregate of all withdrawals in a year.**
 - Opening of a **current account or cash credit account** with a bank or post office.
 - The permanent account number or Aadhaar number along with demographic information or biometric information of an individual shall be submitted to the Principal Director General of Income-tax (Systems) or Director General of Income-tax (Systems) or the person authorised by the Principal Director General of Income-tax (Systems) or Director General of Income-tax (Systems) with the approval of the Board, for authentication referred to in section 139A.
- PAN is also mandatorily required in case of **cash deposit exceeding Rs 50,000 in a single day.**

16. NHA building Health exchange platform

Context: The National Health Authority (NHA) is setting up a health exchange platform that will digitize and simplify the process of filing health insurance claims.

The Health Exchange Platform

- It is a digital public good that aims to **digitize the health insurance industry.**
- It is a simplified workflow with **standardized communication protocol between payer and provider to enable digitization** of claims processing for health insurance, in accordance with IRDAI guidelines.
- This will make **PM-JAY the first insurance scheme in the world** to implement this digital solution.
- NHA has published the sandbox for this gateway to encourage the players in the market to develop digital solutions for health claims exchange.

Ayushman Bharat Digital Mission

- It was launched in September 2021 by the Prime Minister through a video conference
- It aims to provide digital health IDs for all Indian citizens to help hospitals, insurance firms, and citizens access health records electronically when required.
- The **National Health Authority (NHA)** under the Ministry of Health and Family Welfare will be the implementing Agency.
- The Ayushman Bharat Health Account (ABHA), which was earlier known as Ayushman Bharat Health ID aimed at providing a digital health ID to the population.
- ABHA is a unique health ID that uses a 14-digit identification number and can be generated using an Aadhaar card or your mobile number.

What are the Features of the Mission?

- **Health ID** will be issued for every citizen that will also work as their health account.
- This health account will contain details of every test, every disease, the doctors visited, the medicines taken and the diagnosis.
- Health ID is free of cost, voluntary.

- The **other major component of the programme** is creating a Healthcare Professionals' Registry (HPR) and Healthcare Facilities Registry (HFR), allowing easy electronic access to medical professionals and health infrastructure.

17. Account aggregator transaction

Context: A year after its official release, India's Account Aggregator (AA) ecosystem boasts of 1.1 billion.

Account Aggregator (AA) ecosystem

- Account Aggregator (AA) network is a **financial data-sharing system**.
- The AA ecosystem was conceived in 2016 but was officially launched in September 2021.
- It already has 23 banks and three life insurers as financial information providers (FIPs) on its platform and 78 entities registered as financial information users (FIUs). There are **six operational AAs** and another nine in-principle AAs waiting to get their operating licence from RBI.
- The AA platform was **created through an inter-regulatory decision by the Reserve Bank of India (RBI)**, the Securities and Exchange Board of India (Sebi), the Insurance Regulatory and Development Authority (IRDAI), and the Pension Fund Regulatory and Development Authority (PFRDA) through the Financial Stability and Development Council (FSDC).
- RBI issues licenses to AAs.
- The AA framework was **designed by the Reserve Bank Information Technology Pvt. Ltd (ReBIT)**—a wholly-owned unit of RBI.
- It is based on the Data Empowerment and Protection Architecture (DEPA) frame, which is also known as the 'Consent Layer of India Stack'.
- Registering with an AA is fully voluntary for consumers and a customer can reject a consent to share request at any time.
- Account Aggregator empowers the individual with control over their personal financial data.
- An Account Aggregator (AA) is a **type of RBI regulated entity** (with an NBFC-AA license) that helps an individual securely and digitally access and share information from one financial institution they have an account with to any other regulated financial institution in the AA network.
- Data **cannot be shared without the consent** of the individual.
- Account Aggregator replaces the long terms and conditions form of 'blank cheque' acceptance with a granular, step by step permission and control for each use of your data.

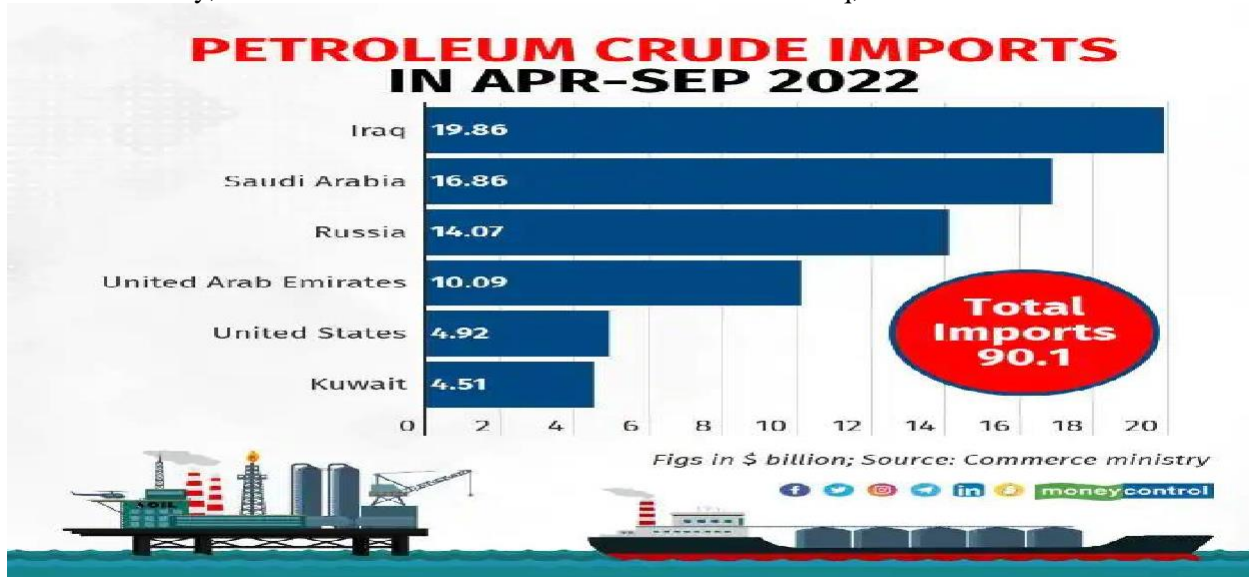
18. Russia India top oil supplier

Context:

Russia is reported to have become India's largest supplier of crude oil since October 2022 as refiners stepped up the purchase of discounted seaborne oil.

Concept

- Traditionally, India has met the bulk of its crude oil needs from Iraq, Saudi Arabia and the United Arab Emirates.



- Bilateral trade with Russia is now larger than trade with countries such as Indonesia, Iraq, Singapore, South Korea and Australia.

- Intensifying the trade and economic relations has been identified as a priority area and India-Russia targets of increasing bilateral investment to \$50 billion and bilateral trade to \$30 billion by 2025.
- As per figures of the Department of Commerce, **bilateral trade during FY 2021-22 amounted to \$13.2 billion.**
 - Indian exports** amounted to \$3.26 billion, while **imports from Russia** amounted to \$9.86 billion.
 - In April-August 2022, the bilateral trade **soared to an all-time high of \$18.23 billion** with India's imports of \$17.23 billion, while India's exports to Russia amounted to \$992.73 million.
- India's exports to that country have been small.
 - Major items of export from India** include electrical machinery, pharmaceuticals, machinery and mechanical appliances, organic chemicals, iron & steel.
 - Major items of import from Russia** include oil and petroleum products, fertilizers, mineral resources, precious stones and metals, vegetable oils, etc.
- Bilateral trade in services** has remained stable during the last 5 years with trade balance in Russia's favor. It amounted to \$1.021 billion for the year 2021.
- Bilateral investments** between the two countries remain strong and surpassed the previous target of \$30 billion in 2018.
 - The major bilateral investments by Russia in India** are in the oil and gas, petrochemicals, banking, railways and steel sectors, while **Indian investments in Russia** are mainly in oil and gas and pharmaceuticals sectors.
- Russia was the seventh largest trade partner during April-August 2022.
 - The rise in oil imports from Russia also made that country **India's fifth largest trade partner in September.**

19. High use of subsidised fertilisers raises crop yield fears

First urea, now DAP: High use of subsidised fertilisers raises crop yield fears

Context- After Urea, another fertilizer is seeing a similar phenomenon of over-application due to underpricing- **Di-Ammonium Phosphate (DAP).**

More in the news-

- This could have implications for **soil health**, ultimately affecting **crop yields**.
- The use of **nitrogen (N), phosphorous (P) and potassium (K)** in the country has over the last few years **sharply deviated** from the **ideal NPK use ratio of 4:2:1**. According to **Fertilizer Association of India (FAI)**, the **N:P:K ratio** was **8.2:3.2:1** in **2011-2012**.
- Data shows a **3.7% increase** in the sale of urea, while increase in the **sale of DAP is 16.94%**, while sale of other fertilizers have declined.
- The **maximum retail price (MRP) of urea** is currently fixed at **Rs 5,628 per tonne**.
- The other fertilisers are technically **"decontrolled"** since **April 2010**, with the Centre only paying a fixed per-tonne subsidy to ensure **"reasonable levels"** of prices.

SALE OF FERTILISERS IN LAKH TONNES

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

*For direct application

What is Diammonium Phosphate (DAP)?

- DAP** is the **second most commonly used fertiliser** in India after urea.
- Farmers normally apply this fertiliser just before or at the beginning of sowing, as it is high in phosphorus (P) that stimulates root development.
- DAP (46% P, 18% Nitrogen)** is the preferred **source of Phosphorus** for farmers. This is similar to urea, which is their preferred nitrogenous fertiliser containing 46% N.

Status of fertilizer industry in India-

- Fertilizer as an industry is under the **control of the Union Government** (being in the First Schedule of the IDR (Industries (Development and Regulation)) Act, 1951 vide **Entry 52 of List I** and also **Entry 33 of List III**).
- **GoI** has declared fertilizers as an **essential commodity**. GoI issued the **Fertilizer Control Order (FCO)** under the **Essential Commodities Act, 1957**.
- No subsidy was paid on Fertilizers till 1977 except Potash for which subsidy was paid only for a year in 1977.
- **Retention Pricing Scheme (RPS):**
 - Introduced for **nitrogenous fertilizers** in 1977.
 - Later, it was extended to **phosphatic** and **potassic fertilizers** (Including Imported fertilizers).
 - In this, the difference between **retention price** (cost of production as assessed by the government plus 12% post-tax return on net worth) and the **statutorily notified sale price** was paid as a subsidy to each manufacturing unit.
 - This was the beginning of the “**Product-based subsidy**” regime.

20. Record issuance of Commercial Pilot Licenses

Context: A senior official at the Directorate General of Civil Aviation (DGCA) on Sunday said that 1,081 CPLs had been issued in 2022 till December 6 and the number was likely to cross 1,100 by the year-end.

Concept:

The record issuance of Commercial Pilot Licenses (CPLs) comes at a time when the country's civil aviation sector is recovering at a fast pace after being hit by the coronavirus pandemic, and the domestic air traffic is inching towards the pre-pandemic level

This was also the highest for any year since 2011, as per the data. In 2014, the number of CPLs issued stood at 896 while the count was at 862 in 2021.

Procedure of license:

- An individual could apply for CPL after completing at least 200 hours of flying and fulfilling other conditions.
- The individual would have to clear theory papers and once successful, the CPL would be given for a period of five years subject to complying with various requirements.
- The license application process is online through the regulator's eGCA platform
- DGCA issues three types of licenses — CPL, Air Transport Pilot License (ATPL) and Private Pilot License (PPL).
- While CPL allows a pilot to start flying as a co-pilot, ATPL permits a pilot to be the commander. PPL is issued for operating private planes.
- Mostly two and four-seater Cessna aircraft are used for flying training activities. The training of a pilot, including flying training is estimated to cost up to ₹50 lakh.
- DGCA has issued more than 25,000 pilot licenses till now and there are estimated to be 11,000-12,000 active pilots. Out of them, 9,000-10,000 pilots are operating commercial planes.

Directorate General of Civil Aviation

- Directorate General of Civil Aviation is an attached office of the Ministry of Civil Aviation.
- The Directorate General of Civil Aviation is the regulatory body in the field of Civil Aviation primarily dealing with safety issues.
- It is responsible for regulation of air transport services to/from/within India and for enforcement of civil air regulations, air safety and airworthiness standards.
- It also co-ordinates all regulatory functions with International Civil Aviation Organisation.

21. Migration and Development Report

Context: World Bank's latest Migration and Development Brief titled, '**Remittances Brave Global Headwinds**'.

Concept:

Remittance denotes a sum of money sent by one party to another. These days, the term typically describes the money sent by someone working abroad to their family back home

Highlights:

- World remittances are expected to touch \$794 billion in 2022, up from \$781 billion in 2021. This represents a growth of 4.9%, compared to 10.2% in 2021, which was the highest since 2010.
- Of the \$794 billion, \$626 billion went to low and middle-income countries (LMICs)
- **The top five recipient countries this year:** India (\$100 billion), followed by Mexico (\$60 billion), China (\$50 billion), the Philippines (\$38 billion) and Egypt (\$32 billion)
- India received \$89.4 billion in 2021 this is the **first time a country will reach the \$100 billion mark**.

Structural Change in key destinations

- **The largest sources of remittances:** Gulf Cooperation Council (GCC) countries (UAE, Bahrain, Saudi Arabia, Oman, Qatar, Kuwait), and the U.S./U.K.

1. **From:** largely lows killed, informal employment in the **Gulf Cooperation Council (GCC)** countries from **54% to 28%** as in GCC countries, Indian migrants benefited from governments' direct support measures to keep inflation low in 2020-2021
2. **To:** a dominant share of high skilled jobs in high income countries such as **the U.S., the U.K., and East Asia (Singapore, Japan, Australia, New Zealand from 26% to 36%** as the Indian migrants in high - income countries worked from home and benefited from large fiscal stimulus packages. while in the post pandemic phase, wage hikes and record high employment conditions supported remittance growth in face of high inflation in 2020-2021.

- The U.S. with a share of 23%, surpassed Saudi Arabia as India's top source country for remittances.

Reasons for sustained growth in remittances

- Reopening of various sectors in host country
- Migrants' determination to help their families back home during the tough post pandemic recovery phase
- Lot to the stimulus measures enacted to underpin faltering high-income economies especially in the U.S. and Europe
- The depreciation of the Indian rupee vis à vis the U.S. dollar – it fell by 10% between January and September 2022 led to an increase in remittances.

Future prospects:

- It predicts that growth in remittances will fall to 2% in 2023 as the GDP growth in high income countries continues to slow, eroding migrants' wage gains. For South Asia as a whole, the growth in remittances is expected to fall from 3.5% in 2022 to 0.7% in 2023.
- A higher inflation combined with a slowdown will limit remittance flows
- The demand for labour is expected to soften as construction activities for the FIFA World Cup in Qatar
- The remittances to India are forecast to grow by 4% next year

22. Technical Barriers to Trade (TBT) Agreement

Context: In the past few years, the tariff reductions have led to the rise in technical barriers to trade (TBTs) and preference trading agreements.

Preferential trade agreements:

- In this type of agreement, two or more partners **give preferential right of entry to certain products by reducing duties on an agreed number of tariff lines.**
- Besides conferring tariff advantages, countries **also establish trading preferences through labour, environmental and technical standards.**
- Many such standards could translate into new Technical Barriers to Trade or non-tariff measures.
- **Example-Indo-Pacific Economic Framework for Prosperity**
 - It was initiated by the **US in May 2022**, with 13 other countries, including Japan and India.
 - Australia, Brunei, Fiji, India, Indonesia, Japan, South Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, United States, and Vietnam.
 - In **September 2022, India opted out** of signing the declaration on IPEF's trade pillar.
 - The IPEF is not a Free Trade Agreement (FTA) but allows members to negotiate the parts they want to. The negotiations will be along four main "pillars".
 - Supply-chain resilience.
 - Clean energy, decarbonisation & infrastructure
 - Taxation & anti-corruption
 - Fair & resilient trade.
 - The trade pillar seeks to connect free and fair trade with technology policy, inclusive growth, and the interests of workers as well as consumers.

The Technical Barriers to Trade (TBT) Agreement

- It aims to ensure that technical regulations, standards, and conformity assessment procedures are **non-discriminatory** and do **not create unnecessary obstacles to trade.**
- It recognises WTO members' right to implement measures to achieve legitimate policy objectives, such as the protection of human health and safety, or protection of the environment.
- The TBT Agreement strongly encourages members to **base their measures on international standards** as a means to facilitate trade.
- TBT (Technical Barriers to Trade) Agreement **covers all technical regulations, voluntary standards and the procedures** to ensure that these are met, **except** when these are sanitary or phytosanitary measures as defined by the **SPS Agreement.**
 - **SPS Agreement** the only justification for not using such standards for **food safety and animal/plant health protection** are scientific arguments resulting from an assessment of the potential health risks.

- Regulations which address microbiological contamination of food, or set allowable levels of pesticide or veterinary drug residues, or identify permitted food additives, fall under the SPS Agreement.
- Some packaging and labelling requirements, if directly related to the safety of the food, are also subject to the SPS Agreement.
- In contrast, under the TBT Agreement governments may decide that international standards are not appropriate for other reasons, including fundamental technological problems or geographical factors. **TBT measures could cover any subject, from car safety to energy-saving devices, to the shape of food cartons.**
- TBT measures could include **pharmaceutical restrictions**, or the **labelling of cigarettes**.
- Most measures related to **human disease control** are under the TBT Agreement, except for the diseases which are carried by plants or animals.
- In terms of **food**, labelling requirements, nutrition claims and concerns, quality and packaging regulations are generally not considered to be sanitary or phytosanitary measures and hence are normally subject to the TBT Agreement.

SPS vs TBT

The sanitary and phytosanitary measures may be imposed only to the extent necessary to **protect human, animal or plant health**, on the basis of scientific information. Governments may, however, introduce TBT regulations when necessary to meet a number of objectives, such as national security or the prevention of deceptive practices.

23. Online gaming tax

Context: Enforcement Directorate (ED) has attached proceeds of crime of more than ₹1,000 crore in several cases related to cyber and crypto assets frauds wherein online gaming etc have been used for siphoning the proceeds.

Details:

- Proceeds of crime have been attached/seized/frozen under the Prevention of Money Laundering Act, 2002 and Section 37A of the Foreign Exchange Management Act, 1999.
- The disclosure of information about specific taxpayers is prohibited except as provided under section 138 of the Income Tax Act, 1961.

Concept:

What is a game of skill versus one of chance?

- **Games of skill** –where "success depends principally upon the superior knowledge, training, attention, experience and adroitness of the player".
 - **For instance**, the ability to strategize the selection of athletes in a virtual football team, to earn points (and eventually money) from picking the best possible team.
- **Games of chance**-where winning would depend solely on luck. Example-gambling
- Staking money or property on the outcome of a '**game of chance**' is **prohibited** and subjects the guilty parties to criminal sanctions. However, placing any stakes on the outcome of a '**game of skill**' is **not illegal** per se and may be permissible.
- **The state legislators** are given exclusive power to make laws relating to betting and gambling. **Gambling is a non-cognisable and bailable offence in India.**

Online gaming?

- Online gaming so far has been a state subject.
- **Real money games (RMGs)** refers to any game that accepts payments in real money from users to payments in real money from users to play.
- Both Daily Fantasy Sport and rummy qualify as RMG and games of skill are legal while other RMGs fall in an undefined space.

Taxing online gaming?

- Any gambling venture is taxed at 28% of the gross value charged from participants, while skill-based gaming ventures are taxed at 18% of their revenue.
- **Income of professional streamers** -Professional streamers are players who stream their games online through YouTube and earn from the streaming platform based on the number of views.
 - It is taxable under the head '**business & profession**' on income after considering business expenses (on net income).
 - This income is taxable at **applicable slab rates** and no tax is payable if income is below ₹2.5 lakh.
- **Income from winnings of real money from online games**
 - It is taxable under "**Income from other sources**".

- Unlike income of professional streamers, **no deductions are allowed, and tax is chargeable on the gross winning** amount credited to the player's account.
- It is taxable at a **flat rate of 31.2% irrespective of the quantum of winnings even if** the total income is below ₹2.5 lakh.
- **Joining bonuses and referral bonuses:**
 - A joining bonus to players on login and referral bonuses for referring friends is taxable on a net **basis at applicable slab rates**.
 - For professionals under the "Income from business and profession" and for others, it will be taxable as "Income from other sources".
- **Distribution during gaming tournaments:**
 - Merchandise received by a professional is taxable under "Income from business & profession" irrespective of the market value of the merchandise.
 - For others, income is taxable only if the total market value of the merchandise exceeds ₹50,000.
- **Income of minors:**
 - Income of a minor child is clubbed with the income of the parent except when the income is on account of application of any skill, talent or specialized knowledge and experience.
 - Given that **online gaming has been held to be a game of skill** by various courts, income of minors from online gaming will be taxable in their own hands depending on the nature of the income.

24. Ex ante and ex post concept:

- Ex- Post and Ex- Ante are terms of **Latin origin** that mean **"after the event"** and **"before the event,"** respectively.
- **In simple words,** 'Ex-ante' means planned and 'Ex-post' means actual or realised.
- In the field of finance, these terminologies **depict the returns from an investment or any other economic activity.**
- **Ex-Ante concept:**
 - It is a **prediction of the returns** that an investor can get from a security or from a company. Thus, it is a **futuristic prediction**.
 - Ex-Ante is a prediction and is useful for an investor, a company, the various economic sectors, and the overall economy as a whole.
 - **Example-** Ex-ante savings refers to the desired savings or planned savings during the period of one year. This is the savings which is intended to be made in the economy during the period of one year.
- **Ex-Post concept:**
 - It is the opposite of the term Ex-Ante.
 - It **means after the occurrence of an event**. Hence, the term is important for those who rely upon **actual or historical results** of security for further decision-making.
 - Investors and analysts can use Ex-Post data for the prediction of future trends, prices, etc. They can predict the returns from a security on the basis of actual returns from it over the years.
 - **Example-** Ex-post savings refers to the **actual savings in the economy from the given level of income during the period of one year.**

25. Cartel in India

Why in the news?

Government plans to include businesses accused of cartel behaviour in the 'settlement and commitment scheme' of the Competition Amendment Bill.

Details:

It will enable cartels to settle their case with the Competition Commission of India (CCI) by paying settlement fees.

Concept:

- According to CCI, a **"Cartel** includes an association of producers, sellers, distributors, traders or service providers who, by agreement amongst themselves, limit, control or attempt to control the production, distribution, sale or price of, or, trade in goods or provision of services".
- **The International Competition Network**, which is a global body dedicated to enforcing competition law, states three common components of a cartel:
 - an agreement
 - between competitors
 - to restrict competition
- **Cartelization** is when enterprises collude to fix prices, indulge in bid rigging, or share customers, etc. When prices are controlled by the government under a law, that is not cartelization.

- It enshrines a situation where a **single entity in the market owns all aspects of products and services** to make them available to the public in abundance.
- Some cartels formed in order to **curb the competition** while other cartels formed for **illegal trade such as drugs and illegal substances**.
- **The Organization of Petroleum Exporting Countries (OPEC)** is considered the world's largest cartel.

Cartel and Indian law:

- Cartelization in India is a **civil offence** that is prohibited under the Competition Act, 2002.
 - **Section 3** of the act certainly prohibits and renders the agreement void when the business partners enter into an agreement with respect to the production of supply, distribution, storage, goods or provisions of the services which are likely to cause an ample amount of adverse effect to the competition in India.
 - Section 3 also **stipulates the provision which basically prohibits the anti-competitive agreement** among the cartel enterprises which includes:-
 - Implicit and explicit determination of purchase and sale of goods.
 - Limiting the control of production, investment and sales services.
 - Allocation of the geographical market.
 - Indulging in the collusive bidding.
- All the enterprises who are involved in the formation of the cartel would **get penalized** with a fine of up to three times the stipulated collected profits or ten percent of the total turnover, whichever is higher.
- CCI can give **full exemption from penalty** to a cartel member who discloses the existence of the cartel and cooperates.
- The act also involves cases with a **criminal offence** in the following cases namely:-
 - Non-compliance with the orders of the competition commission.
 - Breaking an order of the National Company Law Appellate Tribunal (NCLAT) without any reasonable grounds.
- Under the cartel legislation stipulated under the Competition Act, 2002, both **companies and individuals can be prosecuted**.
- The Competition Act, 2002 also empowers the **Competition Commission of India (CCI)** to deal with the **extraterritorial jurisdiction**, thereby giving the power to inquire to any cartel which operates outside India or any foreign company forming a cartel within India.

26. Public Financial Management System (PFMS)

Context: The Public Accounts Committee (PAC) presented a report on the "Implementation of Public Financial Management System [PFMS]."

Details:

- The committee observed that the tasks related to the implementation of the PFMS appeared to have been dealt with a casual approach and there was no proper financial planning of the process.
- The committee held the view that incorporating scientific methods into budgeting, projecting and utilisation of funds would have ensured maintenance of fiscal prudence.

Concept:

The Public Financial Management System (PFMS)

- It was earlier known as Central Plan Schemes Monitoring System (CPSMS)
- It is a web-based online software application developed and implemented by the **Controller General of Accounts (CGA), Department of Expenditure, Ministry of Finance**
- PFMS was initially started during 2009 as a Central Sector Scheme of the Planning Commission with the objective of **tracking funds released under all Plan schemes** of the Government of India, and real time reporting of expenditure at all levels of Programme implementation.
- Subsequently, the scope was enlarged to cover direct payment to beneficiaries under all Schemes.
- Gradually, it has been envisaged that digitization of accounts shall be achieved through PFMS and later more financial activities of the Government of India brought under the ambit of PFMS.
- The primary objective of PFMS is to facilitate a **sound Public Financial Management System for the Government of India (GoI)** by establishing an efficient fund flow system as well as a payment cum accounting network.
- PFMS provides **various stakeholders with a real time, reliable and meaningful management information system and an effective decision support system**, as part of the Digital India initiative of GoI.

The mandate:

- A financial management platform for all plan schemes, a database of all recipient agencies, integration with core banking solutions of banks handling plan funds, integration with State Treasuries and efficient and effective tracking of fund flow to the lowest level of implementation for plan schemes of the Government.
- To provide information across all plan schemes/ implementation agencies in the country on fund utilization.

The Public Accounts Committee (PAC) of Parliament

Public Accounts Committee was **introduced in 1921** after its first mention in the **Government of India Act, 1919** also called Montford Reforms. It is existing in the Indian Constitution since then.

- PAC is **one of the parliamentary committees** that **examine the annual audit reports of CAG** which the President lays before the Parliament of India. Those three reports submitted by CAG are:
 - Audit report on appropriation accounts
 - Audit report on finance accounts
 - Audit report on public undertakings
- The Public Accounts Committee **examines public expenditure**.
- That public expenditure is not only **examined from a legal and formal point of view** to discover technical irregularities but also from the **point of view of the economy, prudence, wisdom, and propriety**.
- The sole purpose to do this is to **bring out cases of waste, loss, corruption**, extravagance, inefficiency, and nugatory expenses.
- Election of Members -By **Parliament every year with proportional representation** by means of a single transferable vote (A minister cannot be elected)
- Members – 22. Out of 22 members, 15 are elected from Lok Sabha (Lower House) and 7 members are elected from Rajya Sabha (Upper House.)
- Term of office – one year
- **Chairman – Speaker appoints** him/her from amongst the members, invariably from the **Opposition Party** since 1967.
- Its limitation – It can **keep a tab on the expenses only after they are incurred**. It has no power to limit expenses.

27. World Bank's Pension Conceptual Framework

- The World Bank provided a **Pension Conceptual Framework in 2008** which is adapted from the World Economic Forum.
- The **Five Pillar Framework** is the template that the World Bank uses for recommendations regarding reform of country-wide pension systems.
- The various pension plans for the provisioning of old age financial security in different countries can be broadly **classified into five groups or pillars**, depending on their funding mode and target population:
 - **Zero pillar:** A non-contributory basic pension from public finances to deal explicitly with the poverty-alleviation objective.
 - **First pillar:** A mandated public pension plan with contributions linked to earnings, with the objective of replacing some pre-retirement income.
 - **Second pillar:** Typically, mandated defined contribution (DC) with individual accounts in occupational or personal pension plans with financial assets.
 - **Third pillar:** Voluntary and fully funded occupational or personal pension plans with financial assets that can provide some flexibility when compared to mandatory schemes.
 - **Fourth pillar:** A voluntary system outside the pension system with access to a range of financial and non-financial assets and informal support such as family, healthcare and housing.
- **The World Bank's Pension Primer identifies** three relevant process criteria for pension:
 - a long-term, credible commitment by the government;
 - local buy-in and leadership; and
 - sufficient capacity building and support for implementation arrangements.

28. The foreign brokerage held back from upgrading India to 'Overweight'

The foreign brokerage held back from upgrading India to 'Overweight' because of high-valuation premium and the weakening balance of payments

Context: Credit Suisse's Global Equities Strategy team has upgraded India from 'Underweight' to 'Benchmark' for 2023, on the back of the country's underlying economic strength.

Details:

In 2022, inflows from domestic institutional investors (DIIs) overshadowed foreign portfolio investments and Credit Suisse sees this trend continuing.

Credit Suisse:

- It was founded in **1856** to fund the development of Switzerland's rail system.
- It is a global **investment bank and financial services** firm headquartered in Zürich
- Credit Suisse is also the primary dealer and Forex counterparty of the FED.
- It releases the **Global Wealth Report**– provides the most comprehensive and up-to-date coverage of information on household wealth worldwide.
- Credit Suisse is organised as a joint-stock company
- **Credit Suisse has two divisions:**
 - **Private Banking & Wealth Management**- Credit Suisse Private Banking has wealth management, corporate and institutional businesses.
 - **Investment Banking**-Credit Suisse Investment Banking handles securities, investment research, trading, prime brokerage, and capital procurement.
- A Shared Services department provides support functions like risk management, legal, IT, and marketing to all areas.
- Credit Suisse Asset Management sells investment classes, alternative investments, real-estate, equities, fixed income products, and other financial products.

What is underweight?

When a market analyst designates a stock or security as an underweight recommendation, he or she is stating their belief that the stock will likely underperform compared to some benchmark stock, security, or index

29. Commodities Board

Context: The commerce ministry is likely to engage with NITI Aayog to rework the five draft Bills pertaining to cash crops tea, coffee, spices, rubber, and tobacco.

Details:

It proposes the repeal of Tea Act, 1953; Spices Board Act, 1986; Rubber Act, 1947; Coffee Act, 1942 and updation of Tobacco Board Act, 1975.

Concept:

Commodity Boards:

- There are **five statutory Commodity Boards under the Department of Commerce**.
- These Boards are responsible for production, development and export of tea, coffee, rubber, spices and tobacco.
- **Coffee Board**
 - The Coffee Board is a statutory organisation constituted under Section (4) of the Coffee Act, 1942.
 - The Board comprises 33 Members including the Chairperson, who is the Chief Executive and functions from Bangalore.
 - The Board is mainly focusing its activities in the areas of research, extension, development, quality upgradation, economic & market intelligence, external & internal promotion and labour welfare.
- **Rubber Board**
 - The Rubber Board is a statutory organisation constituted under Section (4) of the Rubber Act, 1947.
 - The Board is headed by a Chairman appointed by the Central Government and has twenty-seven members representing various interests of the natural rubber industry.
 - Headquarters is located at Kottayam in Kerala.
 - The Board is responsible for the development of the rubber industry in the country by assisting and encouraging research, development, extension and training activities related to rubber.
 - It also maintains statistical data of rubber, takes steps to promote marketing of rubber and undertake labour welfare activities.
- **Tea Board**
 - It was set up as a statutory body on 1st April, 1954 as per Section (4) of the Tea Act, 1953.
 - As an apex body, it looks after the overall development of the tea industry.
 - The Board is headed by a Chairman and consists of 30 Members appointed by the Government of India.
 - For the purpose of tea promotion, three overseas offices are located at London, Moscow and Dubai.
 - The functions and responsibilities of the Tea Board include increasing production and productivity, improving the quality of tea, market promotion, welfare measures for plantation workers and supporting Research and Development. Collection, collation and dissemination of statistical information to all stakeholders.
 - Board exerts control over the producers, manufacturers, exporters, tea brokers, auction organisers and warehouse keepers through various control orders notified under Tea Act.
- **Tobacco Board**

- The Tobacco Board was constituted as a statutory body on 1st January, 1976 under Section (4) of the Tobacco Board Act, 1975.
- While the primary function of the Board is export promotion of all varieties of tobacco and its allied products, its functions extend to production, distribution (for domestic consumption and exports) and export promotion of Flue Cured Virginia (FCV) tobacco.
- **Spices Board**
 - The Spices Board was constituted as a statutory body on 26th February, 1987 under Section (3) of the Spices Board Act, 1986.
 - It is responsible for the development of the cardamom industry and export promotion of the 52 spices listed in the Schedule of the Spices Board Act, 1986.
 - The primary functions of the Board include production development of small and large cardamom, development and promotion of export of spices.
 - The Board is also implementing programmes for development of spices in the North Eastern region, post-harvest improvement of spices and organic spices in the country.

30. National Export Insurance Account (NEIA) Scheme:

- NEIA Trust was established in 2006 to promote project exports from India that are of strategic and national importance.
- It promotes **Medium and Long Term (MLT)/project exports by extending (partial/full) support to covers** issued by ECGC to MLT/project export.
- Exim Bank, in April 2011, in conjunction with ECGC Ltd., introduced a new initiative, viz. Buyer's Credit under the NEIA scheme, under which the Bank finances and facilitates project exports from India.

NIRVIK Scheme:

- **Export Credit Guarantee Corporation of India (ECGC)** has introduced the Export Credit Insurance Scheme (ECIS) called NIRVIK to enhance loan availability and ease the lending process.
- It is an insurance cover guarantee that will cover up to 90% of the principal and interest. The cover will include both pre and post-shipment credit.
- The ECGC currently provides credit guarantee of up to 60% loss.
- The enhanced cover will ensure that Foreign and Rupee export credit interest rates will be below 4% and 8% respectively for exporters.

31. Black hole of public finance: Unequal fiscal burden on citizens

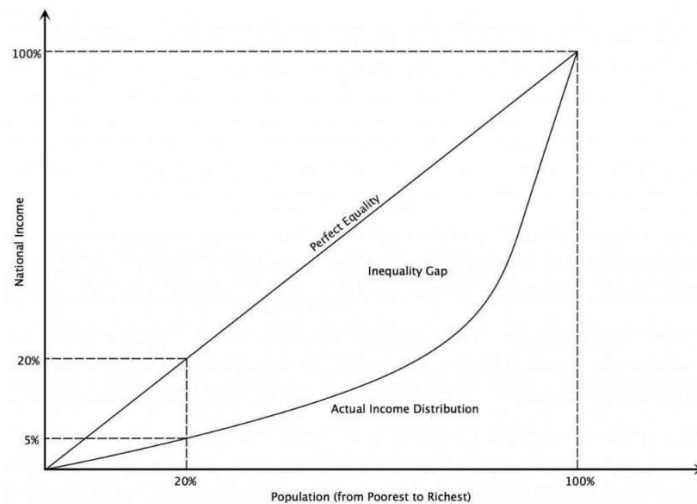
Context: **Economic inequality** in India impacts every aspect of our everyday lives, despite the country being a welfare state. The poor citizens of India continue to face increased fiscal burden in the form of inflation and higher taxes, with fewer benefits.

Details:

- The **Constitution of India** envisaged the state's role as a welfare one.
- For that, the government is empowered to administer taxes and their transfer.
- However, '**transfers**' are being painted as **freebies** and the lives of poor citizens are being burdened by **regressive "taxes"**.
- **Inflation** acts as a **hidden tax** on poor and middle-class citizens.

Inequality scenario in India:

- **Oxfam** observed in its **2021 report** that **73 per cent of the wealth** generated in India in **2017** went to the **richest one per cent**, while **670 million Indians**, who comprise the **poorest half** of the population saw **only a one per cent increase** in their wealth.
- **Concept:**
 - The **Lorenz curve** is used to represent **economic inequality** as well as **unequal wealth distribution**. The farther away the curved line is way from the straight diagonal line, the higher the level of inequality.
 - The **Gini coefficient** is the **ratio** of the area between the line of perfect equality and the observed Lorenz curve to the area between the line of perfect equality and the line of perfect inequality.
 - The **value of Gini coefficient** varies from **zero to one**. Zero represents the perfect equality and one represents the perfect inequality.



Inequality in governance:

- The roadways are meant to be available free of cost, being **public goods**. However, due to privatisation and PPP models, such services demand a fee.
- In the **financial year 2021-2022**, the government mopped up **Rs 35,000 crore as toll tax**. The same is projected to reach **Rs 1.34 lakh cr by 2025**.
- **Diversion of funds:**
 - In **2000**, the government enacted the **Central Road Fund Act (CRF)**, under which **fuel cess** was used to fund the construction and maintenance of roads.
 - In **2018**, **CRF** was amended into the **Central Road and Infrastructure Fund (CRIF)**.
 - This allowed water and sanitation schemes, communication, social infrastructure, etc, to be funded from this fund.
 - But the **utilisation of CRIF funds** for the year **2021-22** ranged from **Jal Jeevan Mission to Swachh Bharat Scheme**.
 - The government aims to generate **Rs 1.6 lakh cr** by monetisation of public highways, which will further increase the **toll burden** on citizens.
 - The **monetisation of public spaces** portends to weaken the **state-citizen relationship**.

Increased inequality due to excessive tax burden:

- In the **2020-21 Budget speech**, the finance minister announced a **public-private partnership (PPP)-based smart cities, railways, and warehouses**, amongst others.
- **PPP-based infrastructure, user charges and cess** have established a **parallel framework to raise revenue** and are likely to impose a **fiscal burden** on citizens.
- When citizens **pay municipal tax**, the municipality is supposed to ensure cleanliness and sanitation facilities.
- But the **Ahmedabad Municipal Corporation (AMC)** introduced a **"User Charge"** of **Rs 365 per household** to make the city clean, which is **15%** of the municipal tax amount.

32. Carbon Border Adjustment Mechanism:

Context: European Union governments have reached a deal on the world's first major carbon border tax to make its economy carbon-neutral by 2050.

Concept:

Carbon Border Adjustment Mechanism:

- The **European Union** has proposed a policy — called the Carbon Border Adjustment Mechanism — to **tax products that are extremely carbon intensive**, with effect from 2026.
- It is a **duty on imports based on the amount of carbon emissions** resulting from the production of the product in question. Thus, adds a pollution price on certain imports to the European Union.
- Carbon-intensive industries inside the bloc must comply with strict emissions standards and CBAM is **designed to ensure** that domestic businesses are not undermined by competitors in countries with weaker rules.
- The measure will apply first to **iron and steel, cement, aluminum, fertilizers, electricity production and hydrogen** before being extended to other goods.
- It also **disincentivizes** EU companies from moving production to more tolerant countries called the **"carbon leakage."**
- Companies will need to buy certificates to cover emissions generated by the production of goods imported into the European Union based on calculations linked to the EU's own carbon price.

- It will also incentivize EU's trading partners to decarbonize their manufacturing industry..

Concerns:

- The EU carbon measure could lead to a **"rapid deindustrialization" of African countries** that export to the European Union.
- Another risk is that **clean energy capacity in poorer countries will simply be shifted to the production of exported goods** while industry aimed at local consumption relies on dirty fuels.

Climate policy overhaul

- The carbon border tax is part of a wider deal that reforms the EU carbon market to cut its emissions 62% by 2030, compared to 2005.
- The ETS is now extended to shipping.
 - The EU carbon market, known as the Emissions Trading System (ETS), already caps greenhouse gas emissions from more than 11,000 power and manufacturing plants, as well as all internal EU flights, covering some 500 airlines.
- Under the latest reforms, the quantity of free emissions allowances will be phased out between 2026 and 2034.
- The Carbon Border Adjustment Mechanism will be phased in at the same time, in that way protecting domestic firms from being undercut by foreign competitors.
- A new carbon market for heating and transport fuels starting in 2027, with the option to delay that by one year if energy prices remain at current high levels.

33. National Test House

Context: The Centre's National Test House (NTH) will set up testing capabilities for testing electric vehicles and EV-charging systems from next fiscal year.

Details:

- It is part of the new initiatives undertaken to make NTH future-ready and garner revenues of ₹30 crore by FY 2024.
- BIS formulates the performance standards for EV batteries.
- Currently, the International Centre for Automotive Technology and the Automatic Research Association of India (ARAI) provide testing facilities for electric vehicles.

Initiatives for NTH:

- Gati Shakti portal will be used to identify gaps in testing infrastructure in the country.
- NTH will set up a state-of-the-art transformer testing facility in Jaipur, Rajasthan.
- NTH is registered in the Government e-Market (GeM) as a service provider in the category "Testing and Calibration Service" to meet the testing needs.
- It is also expanding its services for water testing and fertiliser testing.
- It is also strengthening its presence in the north-eastern region.

National Test House:

- The NTH is the **largest multi-location, multi-disciplinary industrial testing laboratory in India.**
- Industries, Institutions and Trade have been extensively using the unique infrastructure and expertise of NTH over the last ten decades.
- NTH departs its services through seven of its regional branches located at Kolkata, Mumbai, Chennai, Ghaziabad, Jaipur, Guwahati and Varanasi (Satellite Centre).
 - In all these branches testing and evaluation facilities of finished products/raw materials of all the branches of engineering disciplines are available under one roof.
- **Services:**
 - Test & Calibration Facility
 - Dealing with Customers
 - Training Facility
 - Training Calendar
 - Standard followed
 - Research & Development Services
 - Handling of Test & Calibration Samples
 - Training Centre
 - BIS Accredited test facilities
 - NABL Accredited Test facilities
 - PTP Accredited Test facilities
 - NABL Accredited Calibration Facilities

34. HDFC secures \$400 mn IFC loan

HDFC secures \$400 mn IFC loan for financing 'green' affordable housing units

Context: The **International Finance Corporation (IFC)** has extended a **\$400-million loan** to mortgage major **HDFC** for **financing green affordable housing units**, as part of their efforts towards supporting climate goals.

Details:

- It will help close the urban housing gap and improve access to climate-smart affordable homes by boosting green housing.

Need for green affordable housing units:

- It is estimated that **275 million people** in the country, or **22%** of the over 1.4 billion population, **do not have access to adequate housing**, and the **rural housing shortage is twice that of urban areas**.
- As of 2018, the **urban housing shortage** was **29 million units**, increasing by over 54% since 2012.
- Residential housing accounts for around 24% of the country's electricity consumption.
- According to **climate commitments under the Paris agreement** and at the **climate change conference COP-27 at Sharm el-Sheikh**, the green affordable housing sector is key to reducing **greenhouse gas emissions** through **lower household energy consumption** and **greener construction activities**, among others.

Green concepts and techniques in the affordable housing sector can help address the following:

- Reduction in energy and water consumption
- Improved health and hygiene
- Better sanitation
- Better ventilation and light in the dwellings
- Fuel savings in transit of people to work places & associated pollution

KUTUMB: An initiative for Green and affordable housing:

- Initiative of **IILF home finance limited**.
- It is a platform to blend the benefits of green homes within the affordable housing segment in India.
- Kutumb focuses on the needs, efforts and initiatives that can be taken to promote sustainable and energy efficient real estate development in cost effective ways.
- It has partnered with **Asian Development Bank ADB, International Finance Corporation IFC, CDC- a UK sovereign fund, Indian Green Building Council IGBC**, among others.

The five development institutions under the World Bank Group are:

1. International Bank for Reconstruction and Development (IBRD)
2. International Development Association (IDA)
3. **International Finance Corporation (IFC)**
4. Multilateral Guarantee Agency (MIGA)
5. International Centre for the Settlement of Investment Disputes (ICSID)

35. NCLAT

Context: NCLAT has set aside an order passed by the CCI and in another order also held that Competition Act 2002 does not provide that CCI must have a judicial member.

Details:

- The case pertains to CCI rejecting a complaint against a real estate firm for alleged abuse of the dominant position on the basis of a second/supplementary report from the Director General.
- The National Company Law Appellate Tribunal said CCI can pass the order on the basis of the first report filed by the DG office.

Concept:

Competition Appellate Tribunal vs NCLAT authority over CCI:

- The Competition Act, 2007, was enacted after amending Competition Act, 2002, that led to the establishment of the CCI and the Competition Appellate Tribunal.
- The government **replaced the Competition Appellate Tribunal (COMPAT) with the National Company Law Appellate Tribunal (NCLAT) in 2017**.
- In 2017 an amendment was made through which the provision of Part XIV of Chapter VI of the Finance Act, 2017 came into operation.

National Company Law Appellate Tribunal

- National Company Law Appellate Tribunal (NCLAT) was constituted under **Section 410 of the Companies Act, 2013** for hearing appeals against the orders of National Company Law Tribunal(s) (NCLT), with effect from 1st June, 2016.
- **Objectives**
 - Hear appeals against the **orders passed by NCLT(s)** under Section 61 of the Insolvency and Bankruptcy Code, 2016 (IBC).

- Hear appeals against the orders passed by **Insolvency and Bankruptcy Board of India** under Section 202 and Section 211 of IBC.
- Hear and dispose of appeals against any direction issued or decision made or order passed by the **Competition Commission of India (CCI)** – as per the amendment brought to Section 410 of the Companies Act, 2013.
- NCLAT is also the Appellate Tribunal to hear and dispose of appeals against the orders of the **National Financial Reporting Authority**.
- **Composition:**
 - The President of the Tribunal and the chairperson and Judicial Members of the Appellate Tribunal shall be appointed after consultation with the Chief Justice of India.
 - The Members of the Tribunal and the Technical Members shall be appointed on the recommendation of a Selection Committee consisting of:
 - Chief Justice of India or his nominee—Chairperson.
 - A senior Judge of the Supreme Court or a Chief Justice of High Court— Member.
 - Secretary in the Ministry of Corporate Affairs—Member.
 - Secretary in the Ministry of Law and Justice—Member.
 - Secretary in the Department of Financial Services in the Ministry of Finance— Member.
- **Eligibility:**
 - **Chairperson** – Should be/been judge of the Supreme Court or should be/been Chief Justice of the High Court.
 - **Judicial Member** – Is/has been a judge of a High Court or is a judicial member of a tribunal for 5 years or more.
 - **Technical member**– Person with proven ability, integrity and standing having special knowledge and experience of 25 years or more (in specified areas).
 - Term of office of chairperson and members is 5 years and they can be reappointed for additional 5 years.

36. United Nations Framework Classification for Resources

Context: Industry body Assocham has sought reduction in basic customs duty and correction of inverted duty structure on critical raw materials for the aluminium industry.

Concept:

- **Critical Raw Materials (CRMs)** are those raw materials that are economically and strategically important for the economy but have a high-risk associated with their supply.
- Used in environmental technologies, consumer electronics, health, steel-making, defence, space exploration, and aviation, these materials are not only ‘critical’ for key industry sectors and future applications, but also for the sustainable functioning of the economy.
- They include the rare earth elements and other metals such as lithium, indium, tellurium, gallium, and platinum group elements.
- Based on their individual **needs and strategic considerations, different countries create their own lists.**

Assessing the criticality

- India has resources of **nickel, cobalt, molybdenum and heavy rare earth elements**, but further exploration is needed to evaluate the quantities of their reserves.
- India does not produce some of the key minerals for making photo-voltaic cells, such as **silicon, silver, indium, arsenic, gallium, germanium, and tellurium**;
- India also does not produce key minerals needed to make EV batteries, including **lithium and cobalt**;
- **Lithium, strontium and niobium** have relatively high economic importance for India, and **heavy rare earth elements, niobium and silicon** have relatively high supply risks;
- Titanium, lead, and manganese face relatively low levels of supply risks;
- **Nine minerals have relatively low economic importance:** titanium, graphite, silver, vanadium, zinc, lead, cerium, neodymium, and indium; and
- Most minerals have some **degree of substitutability**, except for niobium and silver, for which there are no good substitutes.

The United Nations Framework Classification for Resources (UNFC):

- It is an international scheme for classifying and reporting energy and raw material resources.
- It is a global classification and management system applicable to mineral, petroleum, nuclear fuel, renewable energy and anthropogenic resources, as well as water and injection projects for geological storage.
- UNFC is a policy tool to provide harmonized social, environmental, and economic data for policymakers to create resilient supply chains.

- Data can then provide the basis for resource management decisions as part of the United Nations Resource Management System, in alignment with the Sustainable Development Goals.
- **The Expert Group on Resource Management** is responsible for the promotion and further development of the United Nations Framework Classification for Resources (UNFC) and the United Nations Resource Management System (UNRMS).

37. World Economic League Table (WELT)

Context: The Centre for Economics and Business Research (CEBR)- a UK-based economics consultancy, predicted that India will rise from fifth place in the World Economic League Table (WELT) in 2022 to third by 2037.

Details:

- Despite decelerating global demand and tightening monetary policy India is expected to grow in the fiscal year 2022-23 at 6.8%.
- The report noted that over the next five years, the annual rate of GDP growth is expected to average 6.4% and to average 6.5% in the subsequent nine years.
- India had an estimated PPP-adjusted GDP per capita of \$8,293 in 2022-classifying it as a lower middle-income country.
 - **PPP GDP** is gross domestic product converted to international dollars using purchasing power parity rates.

Positive Prognosis:

- Rebound in economic activity led by a **rise in domestic demand**.
- The near-term growth outlook for the Indian economy is supported by domestic drivers i.e. **low share of external sector** around 20.1% to India's GDP.
- **Inflation in India had been lower** than in most other large economies and mainly driven by food inflation-transitory in nature.
- **The twin balance sheet problem** looks to be on the mend with corporate debt-to-GDP at its lowest in nearly a decade and a half and low NPA.
- Reducing input cost pressures and rise in corporate sales.
- Rise in investments in fixed assets
- The **PLI scheme and capital expenditure** schemes by government -Fresh investments are expected in renewables, electric vehicles, and battery tech.
- **Bank credit** has been growing in double digits for eight months now, reflecting in part an uptick in investment appetite.
- **Term-lending to non-corporates** is seeing an uptick — a positive sign that seems to imply that smaller firms may be seeking funds beyond their immediate working capital needs.
- The Centre had recorded robust **collections in both direct taxes and GST**, reflecting sustained recovery of the corporate sector
- States too have shown some **decline in their consolidated deficits and net market borrowings**.
- **Agriculture has been a sustained driver** for overall GDP growth.

Centre for Business and Economic Research (CBER)

- CBER was formerly called the Bureau of Business Research. It is an economic policy and forecasting research centre. The centre is headquartered in the UK.
- CBER research encompasses health care, regional economies, public finance, energy sector studies and transportation.
- The Cebtr takes its base data from the IMF's World Economic Outlook and uses an internal model to forecast growth, inflation and exchange rates.

WELT:

- Since its first publication in 2009, Cebr's World Economic League Table (known as the WELT) has established itself as the go to measure of the comparative economic success of different countries.
- The WELT is calculated by estimating the current year GDP in current price dollars for each of over 190 world economies, and then forecasting real GDP, inflation and exchange rates for each country over the next 15 years.

38. Weighted average call rate

Context: Private banks continued to outpace public sector banks in credit growth, according to the latest RBI data.

Details:

- The share of private banks in total credit increased to 38.4 per cent in September 2022 from 37.5 a year ago and 29.6 percent five years ago.
- Personal loans increased by 21.9 per cent in September 2022 accounting for one third of the total incremental credit.
- Credit growth in the industrial sector continued for the fourth successive quarter.

- The share of individuals in the total credit reached an all-time high of 44.4 percent in September 2022.
- Female borrowers accounted for 22.6 percent of borrowings by individuals.
- Deposits rose slowly at 9.9% compared to credit growth of 17.5% in the last one year.
- The short-term Weighted Average Call Rate (WACR) has increased to 6.18% as of December 16, 2022, due to liquidity issues in the banking Systems.

Cause of credit offtake?

- Low base effect due to Covid
- Rise in NBFCs
- Rise in the retail credit
- The higher working capital demand driven by inflation and improvement in capacity utilisation ratio
- Rise in demand for fresh capex

Concept:

The short-term Weighted Average Call Rate (WACR):

- **Call money rate** is the rate at which short term funds are borrowed and lent in the money market.
 - The duration of the **call money loan is 1 day**.
 - Banks resort to these types of loans to fill the asset liability mismatch, comply with the statutory CRR and SLR requirements and to meet the sudden demand of funds.
 - RBI, banks, primary dealers etc are the participants of the call money market.
 - Demand and supply of liquidity affect the call money rate. **A tight liquidity condition leads to a rise in call money rate and vice versa**
- **The weighted average call rate (WACR)** – which represents the **unsecured segment of the overnight money market** and is best **reflective of systemic liquidity mismatches** at the margin – is explicitly chosen as the **operating target of monetary policy in India**.
 - **The operating procedure of monetary policy** is guided by the objective of aligning the **operating target of monetary policy – the WACR (weighted average call rate) – to the repo rate** through active liquidity management, consistent with the stance of monetary policy.
 - Once the policy repo rate is announced, liquidity operations are conducted to keep the WACR closely aligned to the repo rate.
 - **Liquidity management instruments** include fixed and variable rate repo/reverse repo auctions, outright open market operations (OMOs), forex swaps etc.
 - A **14-day term repo/reverse repo operation** at a variable rate conducted to coincide with the cash reserve ratio (CRR) maintenance cycle is the main liquidity management tool for managing frictional liquidity requirements.
 - The main liquidity operation is **supported by overnight and/or longer tenor operations** to tide over any unanticipated liquidity changes.
 - Standalone Primary Dealers (SPDs) are allowed to participate directly in all overnight liquidity management operations.
 - If the **weighted average call rate drifts towards the reverse repo rate**–the lower bound of the monetary policy corridor–it will bring down the cost of funds of banks just as a rate cut would have.
- **The liquidity management corridor of RBI:**
 - Marginal standing facility (MSF) rate as its upper bound (ceiling)
 - Standing deposit facility rate as the lower bound (floor)
 - Policy repo rate and reverse repo rate in the middle of the corridor.

39. Index provider Framework

Context: Sebi proposes a regulatory framework for index providers for governance and administration of the financial benchmarks or indices in the domestic securities market.

About the Framework:

- The proposed regulation shall be applicable to **index providers (both domestic and foreign)** if the users of the index/products based on index are located in India
- Under the framework, the index providers offering indices for use in India will be required to **register with Sebi** for obtaining authorization for introduction of indices in the country.
- Index provider shall be a legal entity incorporated under **Companies Act in the country of origin and should have a minimum net worth of Rs 25 crore**.
- The index provider will have to constitute an **oversight committee** for reviewing existing index design and changes to benchmark methodology.

- Index providers must have policies and procedures to **manage conflicts of interest and to protect the integrity and independence** of various functions performed in connection with determination of indices.
- In case an index provider is engaged in any other activity, the activity of the index provider must be completely **ring-fenced to prevent sharing or leakage of any sensitive information**.
- Index providers must document and make available publicly the methodology for index calculation.
- The index providers must be assessed by independent external auditors to evaluate adherence to **International Organization of Securities Commissions (IOSCO)** principles once in two years.

Concept:

- In the stock market, an **index** is essentially a method of measuring a change in value of a group of securities forming part of such an index.
- It performs several functions such as assisting the investors in understanding the health of the market and also enabling them to study the market sentiment, enabling performance measurement and benchmarking.

Index provider:

- **Index providers** are companies that design and calculate indexes.
- They have the responsibility to set the rules that decide what securities to include in each index, how the index will be managed and how securities will be added or removed from that index over time.
- In this process they also usually determine how stocks can be classified, e.g. is a particular stock a Healthcare or an Oil & Gas stock, or is it a Developed or Emerging market stock.
- Index providers license (sell) the rights to use their designs and calculations to ETF issuers who then copy the index as closely as they can to create a passive ETF.
- **EXAMPLES OF INDEX PROVIDERS:**
 - MSCI
 - Standard & Poors
 - FTSE Russell
 - Solactive

International Organization of Securities Commissions (IOSCO):

- **Founded:** April 1983
- **Headquarters:** Madrid, Spain
- IOSCO Asia Pacific Hub is located in Kuala Lumpur, Malaysia.
- It is the international organization that brings together the world's securities regulators, covering more than 95% of the world's securities markets, and is the global standard setter for the securities sector.
- It works closely with the G20 (Group of Twenty) and the Financial Stability Board (FSB) in setting up the standards for strengthening the securities markets.
- The **IOSCO Objectives and Principles of Securities Regulation** have been endorsed by FSB as one of the key standards for sound financial systems.
- IOSCO's enforcement role extends to matters of interpretation of International Financial Reporting Standards (IFRS), where IOSCO maintains a (confidential) database of enforcement actions taken by member agencies.
- IFRS is an accounting standard that has been issued by the International Accounting Standards Board (IASB) with the objective of providing a common accounting language to increase transparency in the presentation of financial information.
- **Objectives:**
 - To cooperate in developing, implementing and promoting adherence to internationally recognized and consistent standards of regulation, oversight and enforcement in order to protect investors, maintain fair, efficient and transparent markets, and seek to address systemic risks;
 - To enhance investor protection and promote investor confidence in the integrity of securities markets, through strengthened information exchange and cooperation in enforcement against misconduct and in supervision of markets and market intermediaries; and
 - To exchange information at both global and regional levels on their respective experiences in order to assist the development of markets, strengthen market infrastructure and implement appropriate regulation.

40. Risk Indicators of Banks

Context: GNPA ratio falls to seven-year low of 5% in Sept 2022: RBI

Details:

- The **gross non-performing assets (GNPA) ratio** (seven-year low) – 5 per cent in September 2022 and would reach 4.9 per cent by September 2023.
- As of September 2022, the **net non-performing assets (NNPA) ratio** (ten-year low) -1.3 per cent, whereas private sector banks' (PVBs') NNPA ratio was below 1 per cent.

- The **GNPA ratios of public sector banks (PSBs)** may increase from 6.5 per cent in September 2022 to 9.4 per cent in September 2023, whereas it would go up from 3.3 per cent to 5.8 per cent for **private sector banks (PVBs)** and from 2.5 per cent to 4.1 per cent for **foreign banks (FBs)**, under the severe stress scenario.
- **The banks are well capitalised**
 - The aggregate **Capital to Risk Weighted Assets Ratio (CRAR)** of 46 major banks is projected to slip from 15.8 per cent in September 2022 to 14.9 per cent by September 2023.
 - It may go down to 14 per cent in the medium stress scenario and to 13.1 per cent under the severe stress scenario, which is well above the minimum capital requirement, including **capital conservation buffer (CCB)** requirements-11.5 per cent.
 - None of the 46 banks would breach the regulatory minimum capital requirement of 9 per cent in the next one year, even in a severely stressed situation.
 - The **common equity tier-1 (CET1) capital ratio** of the selected 46 banks may decline from 12.8 per cent in September 2022 to 12.1 per cent by September 2023 .
- **Banks' credit concentration** – showed that in the extreme scenario of the top three individual borrowers of respective banks failing to repay, no bank will face a drop in CRAR below the regulatory requirement of 9 per cent. However, three banks would see a decline in CRAR below 11.5 per cent – the regulatory minimum inclusive of CCB.

41. Green Finance

Context: India's updated climate change action plan requires financial commitments from Indian and international sources.

Details:

- India's updated climate change action plan:
 - Achieving 50 per cent of installed electric generation capacity through non-fossil fuel-based sources i.e 500GW by 2030.
 - Reducing emissions intensity of GDP by 45 per cent by 2030 compared to 2005 levels.
 - Pledge to reach net zero by 2070.

Key suggestions:

- The Parliamentary Standing Committee on Energy has recommended to MNRE -to explore the possibility of prescribing Renewable Finance Obligation on the lines of Renewable Purchase Obligation.
- Indian banks have urged to include loans for electric vehicles and green hydrogen under the PSL category.
- RBI's Discussion Paper on Climate Risk and Sustainable Finance expects banks to set internal targets to increase green funding.

Green Finance:

Green financing is to increase the level of financial flows (from banking, micro-credit, insurance and investment) from the public, private and not-for-profit sectors to sustainable development priorities.

Global framework for Climate Financing:

To facilitate the provision of climate finance, the UNFCCC has established the financial mechanism to provide financial resources to developing country Parties.

- **The Adaptation Fund under Kyoto Protocol:** It aims to finance concrete projects and programmes that help vulnerable communities in developing countries that are Parties to the Kyoto Protocol to adapt to climate change.
- **Green Climate Fund:** It is the financial mechanism of the UNFCCC, established in 2010.
- **Global Environment Fund (GEF):** GEF has served as an operating entity of the financial mechanism since the Convention came into force in 1994.
 - It is a private equity fund focused on seeking long term financial returns by investments in clean energy under climate change.
 - GEF also maintains two additional funds, the **Special Climate Change Fund (SCCF)** and the **Least Developed Countries Fund (LDCF)**.

Climate Financing in India

- Green financing related to climate change is majorly mobilised from **National Clean Energy Fund (NCEF)** and **National Adaptation Fund (NAF)**.
- The Government of India also provides **funding through eight missions established under the National Action Plan for Climate Change**.
- It has established a **Climate Change Finance Unit (CCFU)** in the **Ministry of Finance**, which is the nodal agency for all climate change financing matters.

Renewable Purchase Obligation:

- Under RPO, power distribution companies purchase a certain percentage of their requirements from renewable energy sources.
- Renewable purchase obligations set targets for states for both solar and non-solar energy procurement as part of their RPO.
- Under Renewable Purchase Obligation (RPO) bulk purchasers like discoms, open access consumers and capacitive users are required to buy a certain proportion of RECs (Renewable Energy Certificates). They can buy RECs from renewable energy producers.
 - **Renewable Energy Certificates (RECs)** is a market-based instrument to promote renewable sources of energy and development of the market in electricity.
 - One REC is created when one megawatt hour of electricity is generated from an eligible renewable energy source.
- RPO was **instituted in 2011**, it is a mandate that requires large power procurers to buy a predetermined fraction of their electricity from renewable sources.
- The proportion of renewable energy for utilities is fixed by the central and state electricity regulatory commissions.
- In India, **RECs are traded on two power exchanges** — Indian Energy Exchange (IEX) and Power Exchange of India (PXIL).
- The **price of RECs** is determined by market demand, and contained between the ‘floor price’ (minimum price) and ‘forbearance price’ (maximum price) specified by the Central Electricity Regulatory Commission (CERC).

42. Custom hiring center

Context: In Madhya Pradesh, farmers are given subsidies by the government for setting up Custom Hiring Centers (CHCs) up to Rs.25 lakhs.

Sub Mission on Agricultural Mechanization (SMAM):

- The Sub-Mission on Agricultural Mechanization (SMAM) was launched in 2014-15 by the Ministry of Agriculture and Farmers’ Welfare, GOI.
- It is aimed at enhancing the reach of farm mechanization to marginal and small farmers and also to areas where power availability is low.
- **Components:**
 - Promotion and Strengthening of Agricultural Mechanization through Training, Testing and Demonstration
 - Demonstration, Training and Distribution of Post-Harvest Technology and Management (PHTM)
 - Financial Assistance for Procurement of Agriculture Machinery and Equipment
 - Establish Farm Machinery Banks for Custom Hiring
 - Establish Hi-Tech, High Productive Equipment Hub for Custom
 - Hiring
 - Promotion of Farm Mechanization in Selected Villages
 - Financial Assistance for Promotion of Mechanized Operations/hectare Carried out Through Custom Hiring Centres
 - Promotion of Farm Machinery and Equipment in North-Eastern Region.

Custom Hiring Centre (CHC)

- It is a unit comprising a set of farm machinery, implements and equipment meant for custom hiring by farmers.
- The main objective of CHC is to supply farm implements to small, marginal and poor farmers at subsidized rates on hire which enables the small and marginal farmers to take up farm operation on time.
- Custom hiring centers (CHCs) for farm implements were established in 100 NICRA villages.
- A committee of farmers nominated by the gram sabha manages the custom hiring centre.
- The rates for hiring the machines/ implements is decided by the Village Climate Risk Management Committee (VCRMC).
- This committee also uses the revenue generated from hiring charges for repair and maintenance of the implements and remaining amount goes into the revolving fund.

Each centre was established at a capital cost of Rs 6.25 lakhs funded by the NICRA project

43.Roundtripping

- A tax haven is a jurisdiction with very low “effective” rates of taxation for foreign investors.
- In some traditional definitions, a tax haven also offers financial secrecy.

- However, while countries with high levels of secrecy but also high rates of taxation, most notably the United States and Germany in the Financial Secrecy Index (“FSI”) rankings, can be featured in some tax haven lists, they are not universally considered as tax havens.
- A list of some of the most popular tax haven countries includes: **Andorra, the Bahamas, Belize, Bermuda, the British Virgin Islands, the Cayman Islands, the Channel Islands, the Cook Islands, The Island of Jersey, Hong Kong, The Isle of Man, Mauritius, Lichtenstein, Monaco, Panama, St. Kitts, and Nevis.**
- Some notable authors on tax havens describe them as “**captured states**”. The term is particularly used for **smaller tax havens, with examples being Antigua, the Seychelles, and Jersey.**
- Worldwide there is not a comprehensively defined standard for the classification of a tax haven country. However, there are several regulatory bodies that monitor tax haven countries, including the Organization of Economic Cooperation and Development (OECD) and the U.S. Government Accountability Office.
- Characteristics of tax haven countries generally include:
 - no or low-income taxes
 - minimal reporting of information
 - lack of transparency obligations
 - lack of local presence requirement
 - marketing of tax haven vehicles.

Round tripping

- Money **leaves the country** through various channels such as **inflated invoices, payments to shell companies overseas, the hawala route** and so on. After cooling its heels overseas for a while, this money returns in a freshly laundered form; thus, completing a round-trip.
- How does the money return to India? It could be invested in offshore funds that in turn **invest in Indian assets**. The Global Depository Receipts (GDR) and Participatory Notes (P-Notes) are some of the other routes that have been used in the past.

SCIENCE AND TECHNOLOGY

1. One step closer to a universal flu vaccine

Context- A new study describes **successful animal tests** of the **Universal flu vaccine**, which can prepare one's body to fight every known strain of influenza. The vaccines rely on **mRNA**.

About the universal vaccine-

- The vaccine is in its early stages and being tested on mice and ferrets only.
- The vaccine provides hope that a single shot can be used against an entire family of viruses. Also, similar vaccines can be developed for another family of viruses like **SARS-CoV-2**.
- The vaccine would not replace annual flu shots but would provide a shield against severe disease and death from potential pandemic threats.

Need for a universal flu vaccine-

- Current influenza vaccines protect against seasonal flu but would provide little protection against a new strain that may emerge as a pandemic threat.
- During the **2009 H1N1 swine flu pandemic** the conventional vaccine offered **little defence against the virus**.
- The main constraint in developing such a vaccine was technical hurdles and the diversity of the flu virus. As there are 20 subgroups of influenza that each representing thousands of viruses.
- Current vaccines can target four subgroups at most.
- But the experimental vaccine contains **all 20**, and it would be faster to produce.
- The vaccine elicited high levels of antibodies to **all 20 flu subtypes in ferrets and mice**.

Challenges in developing such a vaccine-

- The antibodies in test animals were lower when given the vaccines, but still high enough to fight influenza.
- Designing a universal vaccine for all age groups is challenging.
- It is not known yet how long protection from such a vaccine lasts.

Way ahead-

- The vaccine provided strong protection against viruses outside of those 20 subgroups.
- Conventional flu vaccines target only the specific viruses they are designed for. But mRNA vaccines seem to produce antibodies that defend the body against a broader range of viruses than those included.
- The next step for the vaccine would be to test it in monkeys and in people.

2. India improves maternal mortality ratio, but poorer states yet to make progress

In the news-

- India has improved its **maternal mortality ratio (MMR)** — number of deaths per 100,000 live births — to **97 deaths per lakh in 2018-2020** from **103 deaths per lakh in 2017-2019**.
- This is a considerable improvement from the **130 deaths per lakh in 2014-2016**.

What the news data shows-

- The latest data released by the **office of the Registrar General of India**.
- On the regional level, **Assam** continues to have the **highest MMR (195)** but has improved its own performance over the years.
- In **2014-2016**, the north-eastern state's MMR was at a dangerously high **237 deaths per one lakh live births**.
- This has improved significantly over the years to **229 in 2015-2017**, **215 in 2016-2018** and **205 in 2017-2019**.
- In the same vein, **Kerala** continues to remain the **best performer**, with a **low MMR of 19 per one lakh live births**.
- The **southern state** was always performing better than the national average and has almost consistently brought down even that figure — from **46 in 2014-2016**, **42 in 2015-2017**, **43 in 2016-2018** and **30 in 2017-2019**.

States with high MMR	Better performing states
Madhya Pradesh (173)	Kerala (19)
Uttar Pradesh (167)	Maharashtra (33)
Chhattisgarh (137)	Telangana (43)
Odisha (119)	Andhra Pradesh (45)
Bihar (118)	Gujarat (57)

Rajasthan (113)	
Haryana (110)	
Punjab (105)	
West Bengal (105)	

- Most of high MMR states belong to the **Empowered Action Group (EAG)** — a classification of socioeconomically poor regions — on whom the country's development depends.

Maternal mortality rate and lifetime risk-

- The bulletin also includes statistics on **maternal mortality rate and lifetime risk**.
- Maternal mortality rate** is the maternal deaths of women in the **ages 15-49 per lakh of women** in that age group.
- The **Registrar General of India** defines the latter as “the probability that at least one woman of reproductive age (15-49 years) will die due to childbirth or puerperium (postpartum period), assuming that chance of death is uniformly distributed across the entire reproductive span.”
- India's maternal mortality rate is **six**, while **poor-performing states** include Madhya Pradesh (15.3), Uttar Pradesh (14.3), Assam (12.1), Bihar (11) and Chhattisgarh (9.9).
- Kerala** is the only state to achieve a **maternal mortality rate of less than one, at 0.9**.
- Other states in the leading category include Maharashtra (1.8), Telangana (2.3), Andhra Pradesh (2.4) and Tamil Nadu (2.7).
- The lifetime risk figures also show a similar trend, with Madhya Pradesh leading the way at 0.53 per cent, followed by Uttar Pradesh (0.50 per cent), Assam (0.42 per cent), Bihar (0.39 per cent) and Chhattisgarh (0.35 per cent).

MMR as a Sustainable development goal-

- At the **national level**, the lifetime risk of maternal mortality stands at **0.21 per cent**.
- The country achieves its national target of reducing **MMR to below 100**.
- It lags behind the **UN-mandated Sustainable Development Goals target**.
- Target 3.1 of SDG** is reducing the **MMR equivalent to 70 deaths per 100,000 live births**.

Scenario of Anaemia in the country-

- Anaemia levels** among women between the ages of **19 and 49** have **increased to 57 per cent in 2019-2021** from **53.1 per cent in 2015-2016**.

Other health aspects-

- Only **58.1 per cent** mothers had at least **four antenatal care check-ups** and **26 per cent** of mothers consumed **iron folic acid for 180 days** or more during pregnancy.
- Institutional births** across the country have **increased to 88.6 per cent in 2019-2021** from **78.9 per cent in 2014-2016**.

3. World's first intra-nasal vaccine for COVID

Context: World's first intra-nasal vaccine for COVID developed by India has got approval from the Central Drugs Standard Control Organisation (CDSCO) for restricted use in emergency situations in the age group of 18 and above.

Concept:

- iNCOVACC is the **world's first Intranasal vaccine for COVID** developed by India to receive approval for the primary 2-dose schedule and the heterologous booster dose.
- iNCOVACC is a recombinant replication-deficient adenovirus vectored vaccine with a pre-fusion stabilized SARS-CoV-2 spike protein. This vaccine candidate was evaluated in phases I, II, and III clinical trials with successful results.
- iNCOVACC has been specifically formulated to allow intranasal delivery through nasal drops.
- iNCOVACC was developed in partnership with Washington University, St. Louis, which had earlier designed and developed the recombinant adenoviral vector construct and evaluated it in preclinical studies for efficacy.
- Clinical trials were conducted to evaluate iNCOVACC as a primary dose schedule and as a heterologous booster dose for subjects who have previously received two doses of the two commonly administered COVID vaccines in India.
- Washington University licensed the vaccine technology to Bharat Biotech in 2020 for further development.
- iNCOVACC has the double benefit of enabling faster development of variant-specific vaccines and easy nasal delivery that enables mass immunization to protect from emerging variants of concern.
- The nasal delivery system has been designed and developed to be cost-effective in low- and middle-income countries.

4. Increasing the shelf life of stored blood

Context: Institute for Stem Cell Science and Regenerative Medicine (DBT- in Stem), an autonomous institute of the Department of Biotechnology, has developed a **novel blood bag technology** to enhance the quality and shelf life of stored blood by 25%.

Content:

- Millions of blood units are discarded due to decline in quality during storage.
- Stored blood has a **finite shelf life**.
- Typically, stored cells produce various **extracellular components** known as **damage-associated molecular patterns (DAMPs)**, which damage the blood cells during storage.
- The extracellular components being generated are **free-iron and free haemoglobin, bioactive lipids such as poly unsaturated fatty acids, extracellular DNA, nucleosomes, and proteins**. During the storage, these components interact and **damage the red blood cells (RBCs)**.
- Thus, custom designed **nanofibrous sheets** made with **cationic and anionic polymers** will help scavenge damage causing agents through ionic interactions and protect RBCs.
- These nanofibrous sheets can be **made into blood bags** and **intermittent capturing of DAMPs** on day 21 or 28 after collection **using the novel blood bags helped protect RBCs** from losing their membrane integrity and enhanced the transfusion efficiency.
- With this technology, the **quality of 42 days of stored old blood** is as **good** as freshly collected blood and additionally it may be a **boon for preserving rare blood groups**.

5. Benefits of reducing salt intake

Background:

- A recent study published in the Journal of American College of Cardiology showed a higher incidence of heart attacks, heart failure and strokes with higher frequency of adding salt to one's food.
- A 2001 study found salt substitutes reduced the incidence of stroke and heart attack by almost 10%, and deaths too.

India's condition:

- In India a consumption of more than 10 gm per day, far exceeding the recommended allowance.
- A study conducted by Sapiens health foundation amongst school and college students in Chennai showed a 10% prevalence of hypertension.
- In India, the confusion is that the majority of labels show sodium content. The ordinary consumer is not aware that 1 gm of sodium is 2.5 gm of salt.

Dietary Approaches to Stop Hypertension diet (DASH diet)

- DASH is the best recommended diet to prevent cardiovascular events.
- DASH diet involves eating fruits, vegetables, lean meat, poultry, nuts, whole grains, and reducing the intake of saturated fats, cholesterol, and sugar.
- it was found that adding less salt with food was associated with fewer heart attacks and strokes. This was found to be true even in participants who were following the DASH diet (Dietary Approaches to Stop Hypertension).
- The WHO recommends only 5 gm of salt per day.

Other recommendation:

- It is high time that a product is available in two forms — normal and low salt content like the fat content in milk.
- Salt substitutes are good since majority of them contain up to 25% potassium chloride.

6. J C Bose: A Satyagrahi Scientist

Context: On the occasion of 164th birth anniversary of legendary Indian scientist Acharya Jagadish Chandra Bose and as part of Azadi Ka Amrit Mahotsava, Vijnana Bharati and Ministry of Culture, Govt. of India organized an "International conference on the contributions of J C Bose: A Satyagrahi Scientist", at Inter-University Accelerator Centre, New Delhi.

Concept:

- Sir Jagadish Chandra Bose, born November 30, 1858, Bengal, India (now in Bangladesh). He was named the **Father of Radio Science by the Institute of Electrical and Electronics Engineering**.
- After earning a degree from the University of Cambridge (1884), Bose served as professor of physical science (1885–1915) at Presidency College, Calcutta (now Kolkata), which he left to found and direct (1917–37) the Bose Research Institute (now Bose Institute) in Calcutta.
- His books include Response in **the Living and Non-Living (1902)** and **The Nervous Mechanism of Plants (1926)**.

His contributions:

- In 1900, his paper titled “**On the Similarity of Responses in Inorganic and Living Matter**” at the International Congress of Physics, Paris garnered huge appreciation, led to the discovery of the common nature of the electrical response to all forms of stimulation, in animal and plant tissues as well as in some inorganic models.
- He was Indian plant physiologist and physicist whose invention of highly sensitive instruments for the detection of minute responses by living organisms to external stimuli enabled him to anticipate the parallelism between animal and plant tissues noted by later biophysicists
- Bose’s experiments on the **quasi-optical properties of very short radio waves (1895)** led him to make improvements on the coherer, an early form of radio detector, which have contributed to the development of solid-state physics. Bose was thus a key figure in the invention of the modern radio and also in sonic technology.
- He was the **first to demonstrate the wireless transmission and reception of electromagnetic waves**
- He was knighted in 1917 and elected the Fellow of the Royal Society in 1920 for his amazing contributions and achievements.

7. UK: Six children die of Strep A, a common bacterial infection

Context-

- At least six children have died of a **common bacterial infection, Strep A**, in the United Kingdom as of December 5, 2022.

Strep A and its symptoms-

- **Group A streptococcus (GAS)** is a common **bacterium** found in the throat and on the skin.
- This is called **invasive Group A Strep (iGAS)**.
- It usually manifests as **high fever, severe muscle aches, pain** in an area of the body and unexplained vomiting or diarrhoea.
- symptoms of Strep A include **fever, skin rashes** and a **sore** easily treated with **antibiotics**.
- However, there is a chance the infection can get severe when the **bacteria enter the bloodstream**.
- These are **communicable** and can spread through coughs, sneezes and close contact.
- Currently, there is **no vaccine available** to prevent them.

What are the past trends-

- As many as **851 cases of Strep A** were reported from November 14-20, compared to an average of 186 for the same duration in preceding years.
- **Incidence of iGAS cases** is also increasing, up from the pre-pandemic **0.5 cases per 100,000 children** aged 1-4 years from **2017-2019** to **2.3 cases per 100,000 children** this year.

8. What does Elon Musk’s brain chip company Neuralink do?

Context-

WHAT IS NEURALINK DEVELOPING?

- Founded in **2016** by **Musk and a group of engineers**, **Neuralink** is building a **brain chip interface** that can be implanted within the **skull**, which it says could eventually **help disabled patients to move and communicate again, and also restore vision**.
- **Neuralink’s device** has a chip that processes and transmits neural signals that could be transmitted to devices like a computer or a phone.
- Neuralink believes its device will be able to restore neural activity inside the body, allowing those with spinal cord injuries to move limbs and aspires to cure neurological conditions such as Alzheimer’s and dementia.

WHAT PROGRESS HAS NEURALINK MADE?

- In 2021 it showed a macaque playing a simple videogame after being implanted with a brain chip.
- Neuralink has yet to secure U.S. regulatory approval to move to human trials.

9. ISRO inks MoU with Social Alpha to create SpIN

Context: ISRO inks MoU with Social Alpha to establish SpaceTech Innovation Network

Concept:

- Social Alpha is a multistage innovation, curation and venture development platform for science and technology start-ups.
- It addresses the most critical social, economic, and environmental challenges through the power of entrepreneurship and market-creating innovations.
- Since its inception in 2016, Social Alpha has supported more 200 start-ups including 60+ seed investments.

SpaceTech Innovation Network

- SpIN is India’s first dedicated platform for innovation, curation, and venture development for the burgeoning space entrepreneurial ecosystem.

- SpIN will primarily focus on facilitating space tech entrepreneurs in three distinct innovation categories:
- Geospatial Technologies and Downstream Applications;
- Enabling Technologies for Space & Mobility; and
- Aerospace Materials, Sensors, and Avionics.

Innovation Challenge Launched by SpIN

- In line with the partnership announcement, SpIN has launched its first innovation challenge.
- Early-stage start-ups for developing solutions in areas of maritime and land transportation, urbanization, mapping and surveying, disaster management, food security, sustainable agriculture, environmental monitoring, and natural resources management, among others are encouraged to apply.
- **The selected start-ups and innovators will be able to access both Social Alpha's and ISRO's infrastructure and resources.**
- They will be provided active hand-holding in critical areas, including access to product design, testing and validation infrastructure, intellectual property management etc., among other technical and business inputs

10. Oldest known DNA paints a picture of a once-lush arctic world

About the discovery-

- **Location-KapKobenhavn** in Northern Greenland's permafrost, a region 600 miles from the north pole.
- **Species discovered- 135 species** of animal and plants (120 plant species out of which 75 are new). These species include **Mastodons** (a tree species, known to thrive with poplar and birch trees.), geese, lemmings, ants, caribou, Arctic hares, horseshoe crabs, corals and algae.
- **Geological time scale-** The genetic materials found in Greenland are estimated to be **two-million-year-old**. Twice the age of the oldest known DNA of a mammoth in Siberia, which is 1.2 million years old?

What does the discovery suggest?

- Presence of mastodons suggests that the region was once covered by a forest of poplar and birch trees.
- Presence of Caribou suggests the **presence of warm coastal water** in that region.
- They found layers in the sediment in which the minerals revealed that the **Earth's magnetic field had flipped**.

Significance of the discovery-

- To understand the evolutionary process of these species.
- Understanding and developing the new method of DNA extraction and their study.
- Understanding the adaptation process of species to their environment.

11. Toilets spew invisible aerosol plumes with every flush

Here's the proof, captured by high-powered lasers

Context- Every time you flush a toilet, it releases **plumes of tiny water droplets** into the air around you. These droplets, called **aerosol plumes**, can **spread pathogens** from human waste and expose people in public restrooms to contagious diseases.

Aerosols transmissible diseases (ATB)-

- **Aerosol-transmissible diseases (ATDs)**, such as **tuberculosis** and **measles**, are transmitted by **infectious particles or droplets** through inhalation or direct contact with mucous membranes in the respiratory tract or eyes.
- ATDs that spread via the airborne route is called **airborne infectious diseases (AirID)**.
- Aerosol particles containing pathogens are important **human disease vectors**.
- **Smaller particles** that remain suspended in the air for a period of time can **expose people to respiratory diseases** like **influenza** and **COVID-19 through inhalation**.
- **Larger particles** that settle quickly on surfaces can **spread intestinal diseases** like **norovirus** through contact with the hands and mouth.

Probable solution-

- There are ways to reduce human exposure to toilet plumes.
- An obvious strategy is to **close the lid prior to flushing**.
- However, this does not completely eliminate aerosol plumes and many toilets in public, commercial and healthcare settings do not have lids.
- **Ventilation** or **UV disinfection systems** could also mitigate exposure to aerosol plumes in the bathroom.

12. Understanding the cosmos: Bizarre flash of light traced back to kilonova a billion light years away

Context-

- A **flash of light** in the sky that astounded scientists by **lasting close to a minute** has been traced back to an **explosion a billion light years away**. The discovery has broken several assumptions about powerful explosions in the universe.

About the findings-

- The source was found to be an astronomical event called a **kilonova**. The source was relatively closer- only **1 billion light years** away.
 - **Kilonovae** is also known for its **red colours**, which is a signature of the **rare, heavy elements** like **gold** produced in their ejecta. These clues suggested that the source could be a **kilonovae**.
- The event produced **very heavy elements** about **1,000 times the mass of the Earth**. This supports the idea that **kilonovae are the main factories of gold** in the universe.
- These **explosions take place** during the **merger of two neutron stars** or a **neutron star and a black hole**.
- Researchers **could not identify** whether the **GRBs** came from the merger of two neutron stars or a neutron star colliding with a black hole.
 - A **neutron star** is the collapsed core of a massive supergiant star, whereas a **black hole** is a place in space where gravity pulls so much that even light can not get out.
 - **Stellar black holes** are made when the centre of a very big star falls in upon itself or collapses.
 - When this happens, it causes a **supernova** — an exploding star that blasts part of the star into space.
- Both **kilonova** and **supernova** produce the **most energetic form of light** called **Gamma-ray burst (GRBs)**, the former is known to generate shorter pulses lasting less than 2 seconds. This new event, however, generated a **GRB** that lasted roughly 50 seconds.
 - **GRBs** can be divided into **two classes: Long-duration** (2 seconds to several minutes) and **short-duration** (a few milliseconds to 2 seconds) bursts.

This breaks the long-held traditional GRB paradigm that **massive star collapses** produce **long GRBs and supernovae** and **neutron star mergers** produce **short GRBs and kilonovae**.

13. Lots of ‘breakthroughs’, still no cure. Do the new dementia drugs bring us any closer?**Context-****What is Dementia?**

- **Dementia** is an **umbrella term** to describe a group of conditions characterised by a loss of brain function; this includes the ability to remember, plan and make decisions.
- In Australia, dementia is the **second leading cause** of death. For **women**, it's the **leading cause of death**.
- **Older age** is the greatest risk factor for dementia. But dementia is not an inevitable or normal consequence of ageing.
- Up to **70 per cent of all dementia** is attributed to **Alzheimer's disease**. Alzheimer first described as an “**unusual disease of the cerebral cortex**” in **1906**.
 - In **Alzheimer's disease**, **Amyloid protein** builds up in the brain, which further triggers the development of **Tau (a protein)** which induces memory loss.
 - Beyond **amyloid and tau**, a range of other biological, genetic, lifestyle, and environmental factors can also contribute to Alzheimer's disease.
- Other types of dementia include **vascular dementia, frontotemporal dementia, and Lewy body disease**.
- Because **Alzheimer's** is the most common form of dementia, most “**dementia breakthroughs**” often refer to “**breakthroughs**” in **Alzheimer's**.

Two new drugs-

- Two drugs that have received a lot of attention in recent weeks are **aducanumab** (marketed as **Aduhelm**) and **lecanemab**.
- Both drugs showed a substantial reduction in **amyloid in the brain**. But whether this reduction in amyloid resulted in a meaningful benefit in memory and thinking is less clear.
- The **Food and Drug Administration** in the **United States** granted accelerated approval for **aducanumab** as it thought the drug would improve or slow Alzheimer's symptoms.
- **Lecanemab** resulted in a **27 per cent slower decline in memory** and thinking ability.

Major concerns about the drugs

- **Side effects include-** Brain swelling and small brain bleed as detected on brain scans.
- **High cost of drugs-** Aducanumab costs US\$28,200 (A\$42,000) per patient per year.

14. Vikram Sarabhai Space Centre gets new trisonic wind tunnel

- The new trisonic wind tunnel at the Vikram Sarabhai Space Centre (VSSC) was inaugurated recently by conducting the first blow-down test successfully.
- The massive structure, which can perform tests in three speed regimes, equips the Indian Space Research Organisation (ISRO) with a robust in-house support system for space missions.

Trisonic Wind Tunnel

- Trisonic Wind Tunnel is a system to **aid aerodynamic design of rockets and re-entry spacecrafts** by characterising a scaled model by evaluating forces, moments, load distribution, unsteady pressures, acoustic levels etc.
- The tunnel has an overall length of about 160m and has a maximum cross section of 5.4m.
- The tunnel can be used for testing various space vehicles in three flight regimes —
- below the speed of sound (subsonic),
- at the speed of sound (transonic) and
- above the speed of sound (supersonic),
- The tunnel can simulate flight conditions **from 0.2 times the speed of sound (68 m/s) to 4 times the speed of sound (1360 m/s)**.
- Its parts include air storage vessels, a settling chamber where the airflow is ‘smoothened’ out, and nozzles for releasing the air into the test section.
- **Implementation:** The trisonic wind tunnel was implemented through M/s Tata Projects India Ltd with the assistance of industries across the country.
- For years, ISRO had depended on the trisonic wind tunnel at the National Aerospace Laboratory (NAL), Bengaluru.
- **Hypersonic wind tunnel:**
- The VSSC is already equipped with a hypersonic wind tunnel for testing parameters of re-entry missions.
- Commissioned in 2017, this tunnel can simulate flow speeds up to Mach 12.

15. Designing nanoparticles to fight cancer cells

Context:

- A team of researchers from IIT-Jodhpur have reported a breakthrough, at the heart of which is the use of specially designed nanoparticles.
- Indeed, this breakthrough is an entirely new pathway of therapy, whose technological underpinnings can be applied in treating several other diseases, too.

About the process

- Cancer cells, like all cells, die if they accumulate oxygen. Accumulation of oxygen happens when any molecule containing oxygen gets into the cell.
- Such oxygen-containing molecules that damage cells are called ‘**reactive oxidative species**’ or **ROS**, better known as ‘**free radicals**’.
- The oxygen in the ROS reacts with the many chemicals in the cells, destroying their functions, effectively killing them. This is called ‘**oxidative stress**’.
- The team developed a **special type of nanomaterial called ‘upconversion nanoparticles’, or UCNP**, which is a **cocktail of rare metals**.
- A useful property of UCNP is that when they absorb light (get energised) they produce so much ROS as to overwhelm the cancer cell’s antioxidant defence mechanism
- A specific feature of lung cancer cells, called ‘**epidermal growth factor receptor**’, or EGFR is discovered to make entry into the cancer cell.
- These receptors are a sort of entry point into a cell.
- It is similar to the spike proteins of the SARS CoV-2 virus which bind to the ‘ACE2 receptor’ in human cells to enter them.
- After UCNP is inserted into the cancer cells through anti-EGFR antibody, **the UCNP is nourished with Infra-Red light too produce copious quantities of ROS**, creates oxidative stress in the cancer cells which kills them.

Significance

- The UCNP method can also be used in diagnosis. The nanoparticles glow when lit with IR — they can be a good biomarker to identify bad cells.
- This opens up a completely new field of diagnosis called ‘**nano-theranostics**’.
- Indeed, this treatment pathway could be extended to many diseases.

Up conversion nano particles

- Upconversion nanoparticles (UCNPs) are a unique class of optical nanomaterials doped with lanthanide ions featuring a wealth of electronic transitions within the 4f electron shells.
- These nanoparticles can up-convert two or more lower-energy photons into one high-energy photon.
- Upconversion nanoparticles (UCNPs), have the ability to convert near infrared radiations with lower energy into visible radiations with higher energy via a nonlinear optical process.

16. Japanese company’s launches moon lander.

Context: A Japanese space start-up has **launched its own private lander** to the Moon aboard a **SpaceX rocket**.

More about the news:

- Tokyo-based space tech **start-up Ispace's** lunar lander hitched a **ride to the Moon** on a **SpaceX rocket** along with a **lunar rover from the United Arab Emirates**.
- The space **mission is called Hakuto**, Japanese for **white rabbit**.
- The company **Ispace** designed its craft to use minimal fuel to save money and leave more room for cargo
- The **Ispace lander** will aim for **Atlas crater** in the **northeastern section of the moon's near side**, more than 50 miles (87 kilometers) across and just over 1 mile (2 kilometers) deep.
- With its four legs extended, the **lander is more than 7 feet (2.3 meters) tall**.
- The lander is **carrying an orange-sized sphere** from the **Japanese Space Agency** that will **transform into a wheeled robot** on the moon.

More about UAE Rover's:

- The rover, named **Rashid** after **Dubai's royal family**, weighs just **22 pounds (10 kilograms)** and will operate on the surface for **about 10 days**,

17. Traditional medicine sector growing and gaining global attention**Context:**

- Underlining that the sector of traditional medicine is expanding continuously, Prime Minister Modi recently urged the stakeholders to take full advantage of every possibility unfolding in the sector.

More about the news:

- At the valedictory function of the **9th World Ayurveda Congress**, Prime Minister Narendra Modi inaugurated three national Ayush institutes —
 - **All India Institute of Ayurveda (AIIA)**, Goa,
 - **National Institute of Unani Medicine (NIUM)**, Ghaziabad.
 - **National Institute of Homeopathy (NIH)** in Delhi and Panaji.
- The Prime Minister said **more than 30 countries** of the world have given **recognition to Ayurveda as a traditional system of medicine**.

What is World Ayurveda Congress?

- The World Ayurveda Congress is a **platform established by the World Ayurveda Foundation** to **propagate Ayurveda globally** in its true sense.
- The **theme of the 9th edition of WAC** is "**Ayurveda for One Health**".
- It was **held at Panjim, Goa**.
- The **first World Ayurveda Congress (WAC)** was held in **2002 at Kochi** as an outreach
- The subsequent Congresses organized at **Pune, Jaipur, Bangalore, Bhopal, Delhi, Kolkata & Ahmedabad**
- **Previous themes** at the Congress have included "**Ayurveda and World Health**", "**Globalization of Ayurveda**", "**Mainstreaming Ayurveda**", "**Ayurveda for All**", "**Enriching Public Health Through Ayurveda**", "**Health Challenges and Ayurveda**", "**Strengthening the Ayurveda Ecosystem**" and "**Re-aligning the Focus on Health**".

What is World Ayurveda Foundation?

- The World Ayurveda Foundation was **founded in 2011** as an **initiative by Vijnana Bharati** aimed at global propagation of Ayurveda.
- As part of a **larger intellectual movement** under the aegis of the **Swadeshi Science Movement** undertaken by Vijnana Bharati, WAF is a **platform that would take Ayurveda to the world** for all the benefits mankind can draw from traditional health sciences.

What are Traditional Medicines:

- According to the **WHO**, **traditional medicine is the total sum of the "knowledge, skills and practices indigenous and different cultures have used over time to maintain health and prevent, diagnose and treat physical and mental illness"**.
- Traditional Indian medicine is **one of the oldest medical sciences** in the world. **India** has been known to be a **rich repository of medicinal plants**.
- About **8,000 herbal remedies** have been **codified in AYUSH systems in India**.
- **Ayurveda, Unani, Siddha and Folk medicines** are the major systems of indigenous medicines

What are the steps taken by Central government to promote Traditional Medicine sector:

- In **2014**, the Union government **established the Ministry of AYUSH**, a **separate ministry** dedicated to traditional medicine and treatment.
- The **Department of AYUSH**, Ministry of Health and Family Welfare had launched the **National AYUSH Mission (NAM)** during the **12th Plan**.
- The basic **objective of NAM** is to **promote**: -

- **AYUSH medical systems** through **cost effective AYUSH services**, strengthening of educational systems,
 - **Facilitate the enforcement of quality control of Ayurveda, Siddha and Unani & Homoeopathy (ASU &H) drugs.**
 - **Sustainable availability of ASU & H raw-materials.**
 - The **new category 'AYUSH Aahar'** introduced by the FSSAI in its regulations will **help the producers of herbal nutritional supplements.**
 - The **AYUSH Export Promotion Council** has **been set up** recently to **encourage exports and help find foreign markets.**
 - The government is going to **create a network of AYUSH Parks** to encourage research and provide a **new direction to AYUSH manufacturing.**
 - An **incubation center** developed by the **All-India Institute of Ayurveda** was inaugurated by the Ministry of AYUSH. This will **encourage start-up culture** in the field of traditional medicine.
 - The **WHO Global Centre for Traditional Medicine (WHO GCTM)** was **established in Jamnagar, Gujarat.**
- What is WHO Global Centre for Traditional Medicine (GCTM)**
- GCTM will be the **first and only global outpost centre for traditional medicine** across the world.
 - It will **emerge as an international hub** of global wellness.
 - The New Centre will **focus on data, innovation, and sustainability and will optimize the use of traditional medications.**
 - The GCTM will **support efforts** to implement the **WHO's Traditional Medicine Strategy (2014-23).**
 - The centres **five main areas** will be:
 - Research and leadership
 - Evidence and learning
 - Data and analytics
 - Sustainability
 - Equity and innovation and technology

18. India likely to be first to hold satellite spectrum auction: TRAI Chairman

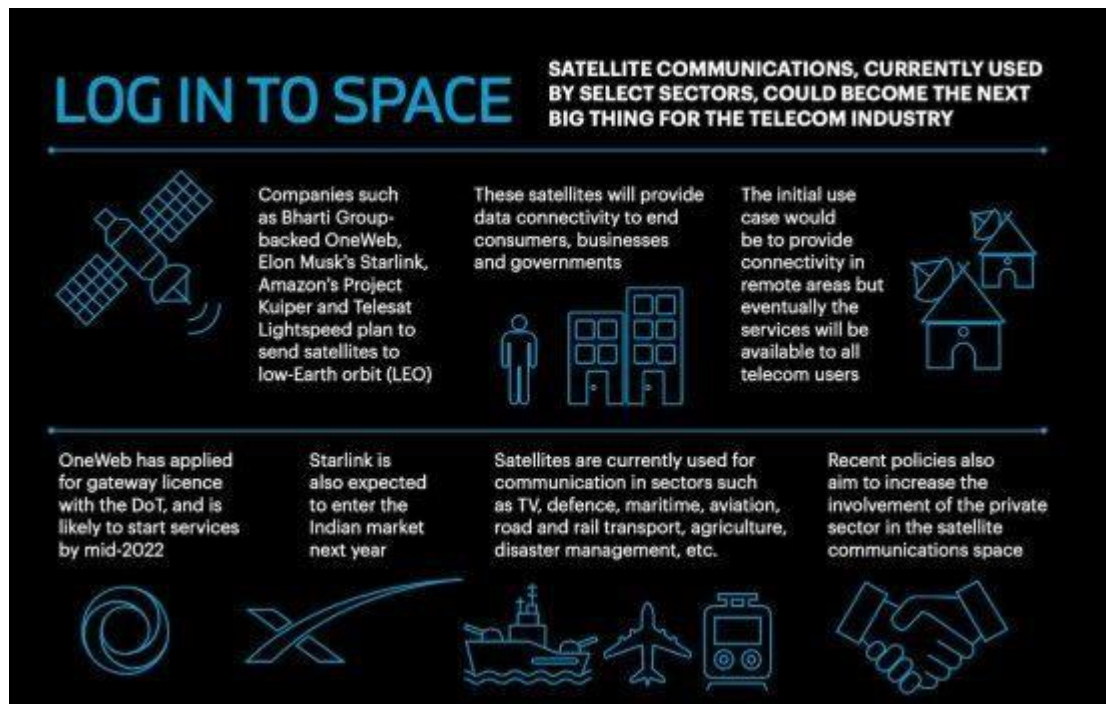
Context- India will be the **first country to auction spectrum for satellite communication (SatCom)**, and it should be designed to attract investments in the sector, telecom regulator **TRAI** chairman P.D. Vaghela said.

Detail-

- It is revealed at the **Broadband India Forum summit on SatCom.**
- It will enhance the **ease of doing business** in the space sector.
- **India** will be the **first to handle the issue of auctioning** the space base spectrum.
- **TRAI** is yet to come up with a consultation paper on the spectrum auction as per the standard process meant for satellite communication.
- While telecom operators have proposed the allocation of spectrum through an auction for satellite communication, satellite industry players have opposed it.

What are Satellite Communications (SATCOM)?

- Satellite communication refers to any communication link that involves the use of an artificial satellite in its propagation path.
- Satellite communication is the method of transporting information from one place to another using a communication satellite in orbit around the earth.



What are the benefits of Satellite Communication (SATCOM) for India?

- **Increased** reach to previously inaccessible areas and hilly terrains.
- **Lesser cost** in reaching to inaccessible areas.
- **Increased** reliability and quality of communication.

Concerns:

- Satellite communication is expensive,
- Setting up ground stations or gateways would require regulatory approvals in each country, and there could be inhibitions with conservative regulators.
- There is no clear policy on Universal Licence (UL) specifically permitting international internet gateways.

Note- TRAI already covered in previous DPN

19. How gene therapy could cure cancer

Context: Scientists in the **United Kingdom** testing a new form of cancer therapy, reported success in a teenaged girl, Alyssia, with a form of cancer called **T-cell acute lymphoblastic leukaemia**.

T-cell acute lymphoblastic leukaemia:

- **T-cells** are a class of **white blood cells** which are equipped to hunt and neutralise threats to the body.
- In this form of **blood cancer**, the **T-cells** turn against the body and end up **destroying healthy cells** that normally help with immunity.
- The disease is **rapid and progressive** and is usually **treated by chemotherapy and radiation therapy**.
- The new experimental gene therapy is relied on a new technique called '**base editing**.' And proved successful on the teenaged cancer patient Alyssia.

What is base editing?

- A **person's genetic code** is several permutations of four bases: **Adenine (A), Guanin (G), cytosine (C) and thymine (T)**.
- Sequences of these bases, akin to letters in the alphabet, spell out **genes** that are instructions to produce the wide array of **proteins** necessary for the body's functions.
- Editing these **base sequences of genes** with the help of a tool known as "**CRISPR-cas9 system**" is called '**Base-editing**'.
- The **CRISPR-cas 9 system**, consists of an enzyme that acts like **molecular scissors**.
- It can be made to cut a piece of DNA at a precise location and a guide RNA can be used to insert a changed genetic code at the sites of incision.
- David Liu, of the Broad Institute, Massachusetts has improvised on the **CRISPR-cas9 system** to be **able to directly change certain bases**: thus, a **C** can be changed into a **G** and **T** into an **A**.
- While still a nascent technology, **base editing** is reportedly more effective at **treating blood disorders** which are caused by so-called **single point mutations**, or when a change in a single base pair can cause terminal disease.

How did base-editing work for Alyssia's therapy?

- In Alyssia's case, her **T-cells** — perhaps because of a **mis-arrangement in the sequence of bases** — had become cancerous.
- A way to correct this **mis-arrangement** could mean a **healthier immune system**.
- With the help of **Base-editing**, scientists have successfully **arranged the sequence bases** which will produce healthier **T-cells**, which can further **regrow her immune system**.

20. Anti-cancer CAR-T therapy reengineers T cells to kill

Anti-cancer CAR-T therapy reengineers T cells to kill tumours — and researchers are expanding the limited types of cancer it can target

Context- Researchers have been developing a **novel type of therapy** that directly gives patients a **new set of T cells** engineered to attack tumours: **chimeric antigen receptor T cells**, or **CAR-T cells** for short.

What are T cells?

- T cells are a type of **white blood cell**.
- Also called T lymphocyte and thymocyte.
- T cells are **part of the immune system** and **develop from stem cells** in the **bone marrow**. They help protect the body from infection and may help fight cancer.

What is CAR-T cell therapy and how does it work?

- CAR-T cell therapy is a treatment to cure several types of cancer including **lymphoma** and **multiple myeloma**.
- It starts with **isolating a patient's T cells** from a sample of their blood.
- These T cells are genetically engineered to produce a **chimeric antigen receptor or CAR**.
 - **CARs** are **synthetic receptors** specifically **designed to redirect T cells** from their usual targets to recognize and kill the tumour cells.
- On the outside of a CAR is a **binder** that allows the **T cell** to **stick to tumour cells**.
- Binding to a tumour cell activates the **engineered T cell** to **kill and produce inflammatory cytokines proteins that support T cell growth** and function and **boost their cancer-killing abilities**.
- These **CAR-T cells** are then stimulated to divide into large numbers over seven to 10 days, and then given back to the patient via infusion.

For which type of cancers the therapy is effective?

- It's already being used to treat **lymphoma** and **multiple myeloma**.
- However, it is not effective against **solid tumours**.
 - Unlike cancers that begin in the **blood**, these types of cancers **grow into a solid mass** (For e.g. **Kidney or Pancreas**) that produces a **microenvironment of molecules, cells and structures** that **prevent T cells from entering into the tumour** and triggering an immune response.
 - Here, even **CAR-T cells engineered to specifically target** a patient's unique tumour are unable to access it, suppressing their ability to kill tumour cells.

Synthetic Notch Receptor (SynNotch):

- Researchers have developed a **new synthetic receptor** that could **complement the first CAR design**.
- This receptor, called **synthetic Notch receptor, or synNotch**, is based on the natural form of Notch in the body, which plays an important role in **organ development** across many species.
- Similar to **CARs**, the **outside of synNotch** has a **binder** that allows **T cells to stick to tumour cells**.
- Unlike CARs, the **inside of synNotch** has a **protein** that is released when a T cell binds to the tumour.
- This **protein, or transcription factor**, allows researchers to better control the T cell by inducing it to produce a specific protein.

Use of synNotch in cancer treatment:

- One of the most useful applications of **synNotch** thus far has been to **use it to ensure that engineered T cells are only activated when bound to a tumour cell** and not healthy cells.
- If successful, the **T cells** will now require **both CAR and synNotch** receptors to recognize tumours, this increases the precision of T cell killing.
- Then it could be used to **improve CAR-T cell therapy** against **solid tumours** by inducing them to **produce more of the inflammatory cytokines**, such as **IL-2**, that enable them to kill tumour cells.
- So, researchers have designed **CAR-T cells** to produce **IL-2** using **synNotch**.
- Now, when a **CAR-T cell** encounters a tumour, it produces **IL-2** within the tumour instead of outside it, avoiding causing harm to surround healthy cells.
- Because **synNotch** is able to **bypass the barriers tumours put up**, it is able to help T cells amp up and maintain the amount of **IL-2** they can make, allowing the **T cells** to keep functioning even in a **hostile microenvironment**.

21. What is the Geminids meteor shower?

Context: This year, the **Geminids** peaked around **December 13-14**.

About Geminids meteor shower:

- The meteor shower is coined '**Geminid**' because according to NASA, the meteors appear to radiate from the **constellation Gemini**.
- The **Geminids** first began appearing in the **mid-1800s**.
- The **Geminids meteor shower** peaks during **mid-December each year**,

Features:

- They are considered to be one of the best and most reliable annual meteor showers.
- They are **bright and fast meteors** and tend to be **yellow in colour**.
- They are unique because, unlike most meteor showers, **they originate not from a comet, but from an asteroid, the 3200 Phaethon**.
 - The **3200 Phaethon** was discovered on **October 11, 1983**.
 - It is named after the **Greek mythology character Phaethon**, son of the Sun God Helios.
 - It takes 1.4 years to complete one round of the Sun.

About Meteors:

- Meteors come from **leftover comet particles and bits from asteroids**.
- When these objects come around the Sun, they leave a dusty trail behind them.
- Every year Earth passes through these debris' trails, which allows the bits to collide with our atmosphere where they disintegrate to create fiery and colourful streaks in the sky.

22. NASA set to launch first global water survey satellite

In the news:

- A **SpaceX rocket** was due for launch from California early on Friday carrying a U.S.-French satellite designed to conduct the first global survey of Earth's surface waters, shedding new light on the mechanics and consequences of climate change.

About the Surface Water and Ocean Topography satellite (SWOT):

- Launched by: **NASA**
- Launching vehicle: **Falcon 9 rocket of SpaceX**
- Launching site: Space Launch Complex 4E at **Vandenberg Space Force Base in California**.
- Satellite built by: **NASA and French space agency CNES**
 - The **Surface Water and Ocean Topography (SWOT) spacecraft** also has contributions from the **Canadian Space Agency (CSA)** and the **UK Space Agency**.
- **Aim:** To observe nearly all the water on our planet's surface, with a prime mission of three years.
 - The satellite will measure the height of water in freshwater bodies and the ocean on more than 90% of Earth's surface.
 - This information will provide insights into how the ocean influences climate change; how a warming world affects lakes, rivers, and reservoirs; and how communities can better prepare for disasters, such as floods.
- **Features of the satellite:**
 - **SWOT** will cover the **entire Earth's surface between 78 degrees south and 78 degrees north latitude** at least once every 21 days, sending back about one terabyte of unprocessed data per day.
 - The **scientific heart of the spacecraft** is an innovative instrument called the **Ka-band radar interferometer (KaRIn)**, which marks a major technological advance.
 - **SWOT mission** will provide data on **more than 95% of the world's lakes** larger than 15 acres (62,500 square meters) and **rivers** wider than 330 feet (100 meters) across.

23. Bihar Hooch tragedy

Context: The official death toll of Bihar hooch tragedy has increased to 28.

- **Alcohol prohibition is a state subject** with each state having full control of alcohol legislation, state excise rates and the organization of production and sale of alcohol.

About Alcohol Making

- Alcoholic beverages are made by **fermentation** of sugary and starchy substances, **followed by distillation** to increase alcohol concentration.
- **Fermentation:**
- When heated, yeast reacts with sugar (from grain, fruits, sugarcane, etc.) to ferment and produce a mixture containing alcohol.
- However, as this process continues and the alcohol levels rise (with more of the sugar getting converted to alcohol),

the conditions become toxic for the yeast itself, eventually ending the process of fermentation.

- **Distillation:**
- Distillation is the process of physically separating the alcohol from the rest of the mixture using evaporation and condensation.
- Through this process alcohol is separated from the fermented mixture and far more potent alcoholic mixture is derived.
- The active ingredient in them is **ethyl alcohol or ethanol**.

Illicit liquor (Hooch):

- Any alcoholic beverage made under unlicensed conditions is called illicit liquor. Usually sub-standard raw material is used, often this is spiked with other chemicals.
- The term hooch is a popular slang for illicit liquor. The origin of the term **hooch is said to come from the Hoochinoo Indians of Alaska**.

What makes it poisonous?

- Hooch-makers also use this principle.
- However, there is an inherent risk associated with the crude methods of production that hooch-makers employ.
- The fermented mixture which is to be distilled **contains more than just consumable alcohol (ethanol)**. It also **contains methanol**, a different form of alcohol which is highly toxic for human beings
- Under unregulated conditions, **methanol or methyl alcohol can be produced with the desired ethanol**.
- Sometimes, industrial methyl alcohol or denatured spirit (mixture of ethanol and methanol) is added by illicit brewers to save costs and in mistaken belief that it'll increase potency.
- **Methyl alcohol is extremely toxic** — 10 ml can cause blindness and 30 ml can cause death within 10 to 30 hours. It is like ethyl alcohol in taste and smell.

Treatment:

- Ethyl alcohol and fomepizole are used as antidotes, inhibiting metabolizing of methyl alcohol so that it passes through urine.
- Advanced treatment requires haemodialysis to remove toxic substances from bloodstream.

24. Genes responsible for long lifespan of banyan, peepal trees identified

Context: Researchers at the **Indian Institute of Science Education and Research (IISER) Bhopal** have carried out **whole genome sequencing** of **banyan** (*Ficus benghalensis*) and **peepal** (*Ficus religiosa*) from leaf tissue samples. They also undertook a comprehensive **genome-wide phylogenetic analysis** with 50 other angiosperm plant species, including four others sequenced *Ficus* species.

Research analysis:

- 17 genes of the Banyan tree and 19 genes of the peepal tree have been identified.
- These genes are having **multiple signs of adaptive evolution (MSA)** that plays a pivotal role in the **long-term survival** of these two **Ficus species**.
- The genes with MSA came about in response to the population bottleneck faced by both trees around **0.8 million years ago**.
 - Genes showing **multiple signs of adaptive evolution** in **banyans** were mainly associated with **root development, leaf formation, metabolism, pollen tube and seed development** and other developmental processes.
 - The **MSA genes** of **peepal trees** were mainly associated with **root development, reproduction, and metabolism**.
- The **comparative evolutionary analysis** performed across **20 phylogenetically closer Eudicot species** revealed adaptive evolution in genes involved in major cellular mechanisms associated with long-time survival such as **phytohormones signalling, senescence pathways, fig-wasp coevolution, and stress tolerance**.
- Gene family expansion/contraction analysis revealed that the highly expanded gene families of both species were involved in **disease resistance functions** in plants.
- In the case of the **banyan tree**, **15 of 17 MSA genes** were also associated with **tolerance against environmental stress** — drought, oxidative stress, and pathogens. In **peepal trees**, **17 out of 19 MSA genes** were associated with **stress tolerance activities**.
 - Stress tolerance mechanisms are also responsible for the **medicinal properties** of these trees.
- In addition, the researchers **identified seven genes** involved in **two pathways** that produce **volatile organic compounds** in floral scents which **attract wasps for pollination**.

25. Reasons for treatment resistance in prostate cancer found

Context:

- **Prostate cancer cell dynamics** at a **single-cell resolution** across the time span of the disease — from its beginning to the point of androgen independence, where the tumour no longer responds to hormone, deprivation therapy has now been characterised.

Research analysis:

- Researchers have found that a **gene** called **Pten**, which codes for a **tumour-suppressing enzyme**, is inactive in the majority of advanced prostate cancer patients.
- This suggests that **basal cells** can transform into **intermediate cells** (**expansion of these cells causes prostate cancer**) upon **Pten deletion**.
- In the **intermediate cells**, the researchers discovered that a **5-gene signature** is specifically enriched.
- Using **two datasets of bulk RNA-sequencing** from **prostate cancer patients**, they showed that the **signature is associated with treatment resistance and poor clinical outcomes**.

Significance of the findings:

- An **expansion of intermediate cells** correlates with resistance to treatment and poor clinical outcomes in humans.
- These cells are **castration-resistant**, meaning they continue to grow **in the absence of testosterone** and could explain how prostate tumours become resistant to hormone-related treatments.
- These findings suggest that a **5-gene signature** derived from prostate cancer may have **importance in understanding human disease**.
- The presence of this gene signature may **serve as a useful prognostic tool for predicting treatment resistance and outcomes in patients**.

Prostate cancer:

- It is cancer in a man's prostate, a small walnut-sized gland that produces seminal fluid.
 - The **prostate gland epithelium** — a **type of body tissue** that forms the surface of glands and organs — is typically composed of **two types of epithelial cells: basal cells and highly differentiated luminal cells** (cells which have altered in form).
- Prostate cancer is the **most diagnosed form of cancer** and the **second-leading cause of cancer-related deaths in males** in the U.S.
- This is due to incomplete knowledge of the cellular drivers behind the disease's progression and the risk of progressing to **castration-resistant prostate cancer (CRPC)**.

26. Breast Cancer, not a matter of 'national' or 'urgent' emergency

Context: Breast cancer, by the government's estimate, is the leading cause of cancer in women in India however it doesn't qualify as a matter of "national" or "extreme" urgency in the Health Ministry's reckoning, suggest court filings as part of an ongoing case in the Kerala High Court.

About Breast Cancer

- Breast Cancer is a type of **cancer that arises in the epithelium (lining cells) of the ducts or lobules in the glandular tissues of the breast**.
- Breast cancer is the most common form of cancer in women.
- It is responsible for one in six cancer deaths among women and has overtaken lung cancer as the world's most commonly diagnosed cancer.
- **Survival Rates:** Breast cancer survives for five years after diagnosis exceeds 80% in most high-income countries. However, it is 66% in India and 40% in South Africa.

About BRCA Gene Mutation

- The genes most commonly affected in hereditary breast and ovarian cancer are the breast cancer 1 (BRCA1) and breast cancer 2 (BRCA2) genes.
- Normally, the BRCA1 and BRCA2 genes protect you from getting certain cancers.
- They help repair damaged DNA or destroy cells if the damaged DNA cannot be repaired. Because of this, the **BRCA genes** are known as tumour suppressor or **caretaker genes**.
- However, in some people, these tumour suppression genes do not work properly.
- When a gene becomes altered or broken, it doesn't function correctly. This is called a **gene mutation**.
- So that if you inherit one of these mutations, you are more likely to get breast, ovarian, and other cancers.

BRCA Gene Test

- The BRCA gene test is a blood test that's done to determine if you have changes (mutations) in your DNA that increase the risk of breast cancer.
- BRCA 1 and an unrelated BRCA 2 are proteins associated with breast tissues .
- Mutations in either breast cancer gene — BRCA1 or BRCA2 — significantly increase the risk of breast cancer.

- Everyone has two copies of each of these genes — **one copy inherited from each parent.**
- Women with abnormal BRCA 1 or BRCA 2 genes have up to 80 per cent risk of developing breast cancer by age 90 and women with BRCA 1 mutations have up to 55 per cent risk of developing ovarian cancer.
- The discovery of BRCA mutations is of recent origin, starting in 1990. Testing for BRCA mutations became possible in 1994.
- While BRCA mutations are primarily associated with breast and ovarian cancer, there is some evidence of their role in other cancers, especially in the abdominal and thoracic cavities.
- Women linked to the BRCA mutation have considerably elevated risk of pancreatic cancer.
- If BRCA mutation is tested positive for breast cancer, regular breast self-examination must start at the age of 18.

About Global Breast Cancer Initiative:

- The **World Health Organization (WHO)** announced an initiative called the “**Global Breast Cancer Initiative**”.
- Aim: The initiative aims to reduce **global breast mortality by 2.5% by 2040.**
- The initiative will particularly focus on reducing deaths in low-income countries. There the progress to tackle the disease is relatively slow.
- **Key Features of the Initiative:**
- **Guidance to Governments:** Under the initiative, WHO will work with other UN agencies. They will provide guidance to governments on how to strengthen systems for diagnosing and treating breast cancer. It is expected to improve capacities to manage other types of cancer.
- **Evidence-based Technical Package:** An evidence-based technical package will also be provided to countries as part of the initiative. It will incorporate existing WHO cancer tools and products.

Breast Cancer Awareness

- Every year the **Breast Cancer Awareness Month (BCAM)** is observed in the month of **October, from 01 to 31.**
- The annual international health campaign aims to increase awareness of the disease and to raise funds for research into its cause, prevention, diagnosis, treatment and cure.
- The **pink ribbon is an international symbol of breast cancer awareness.**

27. Atomic Bomb

Context: The Secretary of Energy on Friday nullified a 1954 decision to revoke the security clearance of J. Robert Oppenheimer, a top government scientist who led the making of the atomic bomb in World War II but fell under suspicion of being a Soviet spy at the height of the McCarthy era.

About Atomic Bomb

- The atomic bomb is also known as A-bomb, atom bomb, nuclear bomb, or nuclear warhead.
- The atomic bomb gets its destructive property from nuclear fission reactions or from the **combination of nuclear fission or fusion reactions.**
- **Nuclear fission:** It is a process in which the nucleus of an atom splits into two or smaller nuclear fission products and usually some by-product particles. Hence, fission is a form of elemental transmutation.
- Atomic bombs too realize an enormous amount of energy when exploded and cause mass destruction.
- This explosion is caused due to the nuclear fission reaction where the splitting of nuclei of a heavy element like uranium, and plutonium takes place

The Explosion of Atomic Bomb

- When the neutron strikes the nucleus of a uranium-235 or plutonium-239 isotope, it causes the nucleus of the atom to split into two fragments, each of which is a nucleus with about half the protons and neutrons of the original nucleus.
- When the splitting takes place, a high amount of heat, gamma rays, as well as two or more neutrons are released.
- Under certain conditions, the neutrons are made to fission more with uranium nuclei, which then emit more neutrons that split more nuclei. This series multiplies, resulting in an explosion.

Hydrogen Bomb

- The hydrogen bomb (or) h bomb is also known as the thermonuclear bomb. These bombs have greater destructive power compared to atomic bombs.
- These hydrogen bombs are the result of nuclear fusion reactions. The uncontrolled chain reaction that is self-sustaining under high temperatures takes place through a **process known as nuclear fusion.**
- **Nuclear Fusion:** Reaction which involves combining two or more atomic nuclei to create one or more distinct atomic nuclei and subatomic particles is known as nuclear fusion.
- Energy released or absorption of energy is given as the difference in the mass between the reactants and products.
- **Nuclear fusion weapons feature two main components:**
- Main components of the primary stage **are Uranium-235 and or Plutonium-239.**
- A separate nuclear fusion **secondary stage featuring a thermonuclear fuel:** deuterium, tritium, or lithium

deuteride.

- Deuterium and tritium are isotopes of hydrogen, which provide ideal interacting nuclei for the fusion process. At present, lithium-6 deuteride is used as weapon fuel.

The Explosion of Hydrogen Bomb

- The explosion of a Hydrogen bomb or H bomb takes place in two stages, primary stage and secondary stage, namely.
- In the primary stage, fissionable uranium is used to establish a fission chain reaction. This, in turn, produces explosions and creates a high temperature of several million degrees.
- It also produces a huge amount of radiation containing a large number of neutrons. The force and heat of this explosion are reflected back by a surrounding container of uranium and are streamed towards the secondary stage.
- The secondary stage features the lithium-6 deuteride. The heat generated in the primary stage supports the fusion reaction and causes a huge explosion that blows the uranium container apart.
- The entire hydrogen bomb explosion takes place in a fraction of a second.

28. Gondwana 'wellspring' of mammalian evolution, not Laurasia: Research

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

More about the research:

- The researchers studied the molars of fossils found in **Madagascar, South America and India** and dated the fossils to be around **50 million years older** than similar remains found in the northern hemisphere.
 - **Madagascar, South America and the Indian subcontinent** were **part of Gondwana** along with **Africa, South America and Australia**.
 - **Europe, Asia (excluding India) and North America** formed **Laurasia**.
- The research indicates that **Theria (a subgroup of mammals)** evolved in **Gondwana**, **thriving** and diversifying there for **50 million years before migrating to Asia** during the **early Cretaceous**. Once they arrived in Asia they diversified rapidly, filling many **ecological niches**.
- Australia's current status as a '**marsupial paradise**' is proof that the findings could be true. The **world's smallest continent** is home to the **greatest mammalian diversity** in the world, more than any other continent.
 - **Half of the over 350 native mammals of Australia** are marsupials including **kangaroos, wombats, koalas, and Tasmanian devils**.
 - There are also **monotremes** and **placentals** like bats and rodents.
- The **highest number of mammalian extinctions** in the world has also happened in **Australia**.
 - Human habitation, the rapid rate of climate change, the destruction of habitat and the introduction of exotic species were responsible for this.

About mammals:

- **Modern mammals** consist of **three subgroups**:
 1. Monotremes,
 2. Marsupials and
 3. Placentals.
- **Monotremes** are **primitive mammals** that **lay large eggs** and have a common opening for the urogenital and digestive systems. **Monotremes** include the **platypus** and **echidna** of **Australia**.
- **Marsupials** are mammals whose young are born incompletely developed. They develop inside a pouch on the mother's belly. **Marsupials** are **mostly found** in **Australia** and **New Guinea**.
- The third subgroup is **placentals** which **carry the foetus** until a late stage of development. **Placentals** comprise the **majority of mammals** including **humans**.

29. Deep fake technology: how and why China is planning to regulate it

- The Cyberspace Administration of China, the country's cyberspace watchdog, is rolling out new regulations to restrict the use of deep synthesis technology and curb disinformation.
- **Deep synthesis is defined as the use of technologies, including deep learning and augmented reality**, to generate text, images, audio, and video to create virtual scenes.
- One of the most notorious applications of the technology is Deep fakes, where synthetic media is used to swap the face or voice of one person for another.

About Deep fake Technology

- A deep fake is a **digitally forged image or video of a person** that **makes them appear to be someone else**.
- It is the next level of fake content creation that takes **advantage of Artificial Intelligence (AI)**.
- Artificial intelligence refers to the simulation of human intelligence in machines that are programmed to think like humans and mimic their actions.

- It can create people who do not exist and it can fake real people saying and doing things they did not say or do.

Origin of the term:

- The term deep fake originated in 2017, when an anonymous Reddit user called himself “Deepfakes.”
- This user manipulated Google’s open-source, deep-learning technology to create and post pornographic videos.
- The videos were doctored with a technique known as face-swapping. The user “Deepfakes” replaced real faces with celebrity faces.

How this technology is being misused?

- Deep fake technology is now being used for nefarious purposes like –
- **Scams and hoaxes,**
- **Celebrity pornography,**
- **Election manipulation,**
- **Social engineering,**
- **Automated disinformation attacks,**
- **Identity theft and financial fraud.**

China’s new policy to curb deep fakes:

- China’s new policy requires deep synthesis service providers and **users to ensure that any doctored content using the technology is explicitly labelled** and can be traced back to its source.
- The regulation also mandates people using the technology to edit someone’s image or voice, to notify and **take the consent of the person in question.**
- When reposting news made by the technology, the **source can only be from the government-approved list of news outlets.**
- Deep synthesis service providers must also abide by local laws, respect ethics, and maintain the “correct political direction and correct public opinion orientation”, according to the new regulation.

Global Efforts to regulate Deep fake technology

- **European Union**
- The EU has an updated Code of Practice to stop the spread of disinformation through deepfakes.
- The revised Code requires tech companies including Google, Meta, and Twitter to take measures in countering deep fakes and fake accounts on their platforms.
- They have six months to implement their measures once they have signed up to the Code.
- If found non-compliant, these companies can face fines as much as 6% of their annual global turnover.
- **United States**
- In July 2021, the US introduced the bipartisan Deep fake Task Force Act to assist the Department of Homeland Security (DHS) to counter deep fake technology.
- The measure directs the DHS to conduct an annual study of deep fakes - assess the technology used, track its uses by foreign and domestic entities, and come up with available countermeasures to tackle the same.
- **India**
- In India, currently, there are no legal rules against using deep fake technology.
- However, specific laws can be addressed for misusing the tech, which include Copyright violation, Defamation, et.
- **Canada:**
- Canada does not have any regulations regarding deep fakes but it is in a unique position to lead the initiative against deep fakes.
- The government of Canada has employed cutting-edge Artificial Intelligence (AI) research with a number of domestic and foreign actors

30. Fusion Energy Breakthrough

- Recently, Scientists in the United States have **achieved a net gain in energy for the first time from a nuclear fusion reaction** which is considered as the most dependable source of energy in future.
- The experiment was conducted at the Lawrence Livermore National Laboratory in California.

About the Experiment

- The experiment forced a minuscule amount of hydrogen into a peppercorn-sized capsule, for which scientists used a powerful 192-beam laser that could generate 100 million degrees Celsius of heat.
- It is also called ‘**Inertial Fusion**’.
- At some other places, including the **international collaborative project in southern France called ITER** (International Thermonuclear Experimental Reactor) in which India is a partner; very strong magnetic fields are used for the same purpose.
- The laser beam was hotter than the Sun’s centre and helped to compress the hydrogen fuel to more than 100 billion times that of Earth’s atmosphere.

- Under the pressure of these forces, the capsule started imploding on itself and leading to the fusion of hydrogen atoms and the release of energy.

Difference between the US experiment and ITER experiment held in early 2022

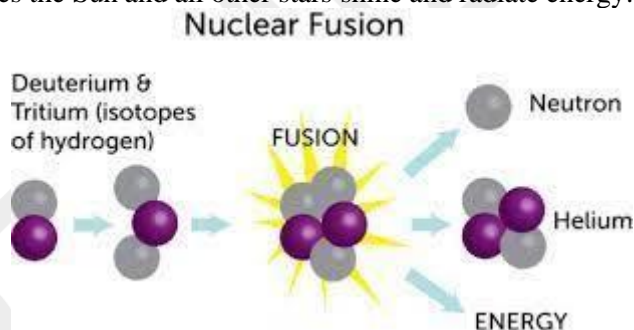
- In ITER (a multi-country effort in which India is involved), they held the plasma in the vessel by a method called '**magnetic confinement**'. Wherever the particles go, they encounter **magnetic forces that push them right back inside**.
- In the US experiment, they used another method called '**inertial confinement**'. The laser beams, 192 of them, coming from all around the capsule, **denied an escape route for the particles** in the plasma to shoot out. In fact, the laser energy compresses the particles.
- Most scientists say that magnetic confinement is a better way.
- Another significant difference is that **while ITER produced energy from fusion, there was no 'net gain'**. But in the case of the **US experiment, an energy gain was reported**.

Future Prospects of the achievement

- Attempts to master the fusion process have been going on at least since the 1950s, but it is incredibly difficult and is still at an experimental stage.
- The nuclear energy currently in use across the world comes from the fission process.
- Besides greater energy yield, **fusion is also a carbon-free source of energy**, and has **negligible radiation risks**.
- Though the achievement is significant, it does little to bring **the goal of producing electricity from fusion reactions any closer to reality**.
- By all estimates, use of the fusion process for generating electricity at a commercial scale is still two to three decades away.
- The technology used in the US experiment might take even longer to get deployed.

Fusion Process

- Fusion is a different, but more powerful, way of harnessing the immense energy trapped in the nucleus of an atom.
- In fusion, **nuclei of two lighter elements are made to fuse together** to form the nucleus of a heavier atom.
- A large amount of energy is released in both fusion and fission processes, **but substantially more in fusion than fission**.
- This is the process that makes the Sun and all other stars shine and radiate energy.



Complexity involved in the process

- When two positively charged nuclei come close to each other, they repel, or move away from each other, because fundamentally, like charges (positive-positive or negative-negative) repel and unlike charges (positive-negative) attract.
- So, to fuse two nuclei into one larger nucleus, you need to overcome the force of repulsion.
- It is like bringing together the north poles or south poles of two magnets. The closer you bring the positively charged nuclei, the more energy you need to bring them further closer.
- But at a **particular point (called 'Coloumb barrier')** the nuclei yield. If you bring them as close as a millionth of a billionth of a meter (or, one 'femtometer'), the repulsive forces are overpowered by the attractive nuclear forces.
- At this distance, the nuclei rush into each other's arms and fuse into one.**
- The trick is to ride over the hump called the Coloumb barrier; the **way to achieve this trick is to keep giving energy**.

Why hydrogen and its isotopes are used?

- Because the hydrogen atom has only one proton — therefore, the **lowest positive charge**.
- The next element, helium, has two protons, the next, lithium, has three, and so on. It is **easier to try to fuse two nuclei with the least charge**.
- They **use isotopes of hydrogen, D and T**, because these nuclei have one and two neutrons, respectively.
- The presence of **neutrons increases the nuclear forces of attraction**, which come into play once the Coloumb barrier is crossed.

Difference between fusion and fission process: -

	Fission	Fusion
<u>Definition</u>	Fission is the splitting of a large atom into two or more smaller ones.	Fusion is the fusing of two or more lighter atoms into a larger one.
<u>Occurrence</u>	Fission reaction does not normally occur in nature.	Fusion occurs in stars, such as the sun.
<u>Energy Requirement</u>	Takes little energy to split two atoms in a fission reaction.	Extremely high energy is required to bring two or more protons.
<u>Energy Released</u>	The energy released by fission is a million times greater than that released in chemical reactions, but lower than the energy released by nuclear fusion.	The Energy released by fusion is three to four times greater than the energy released by fission.
<u>Energy production</u>	Fission is used in nuclear power plants.	Fusion is an experimental technology for producing power.

About ITER (International Thermonuclear Experimental Reactor)

- It is an **international nuclear fusion research and engineering megaproject** aimed at **creating energy by replicating on Earth the fusion processes of the Sun**.
- When operational it would become the biggest machine anywhere in the world which would be more complex than the Large Hadron Collider at CERN or the LIGO project to detect gravitational waves.
- Currently, the ITER reactor is in the machine assembly phase.
- **India joined the ITER project in 2005.**
- The **Institute for Plasma Research in Ahmedabad**, a laboratory under the Department of Atomic Energy, is the **lead institution from the Indian side** participating in the project.

31. Introducing INS Mormugao, the Navy's new guided missile destroyer

Context: The second of the **Project 15B stealth-guided missile destroyers** built by **Mazagon Dock Shipbuilders Limited (MDSL)**, **INS Mormugao (Pennant D67)**, was commissioned into the Indian Navy on Sunday. The ship, named after a **key port in Goa**, was commissioned a day before the **Goa Liberation Day celebrations**.

Project 15B and its predecessors:

- **1987-2001: Delhi class of ships:**
 - **Active:** 3 (INS Delhi, INS Mysore, and INS Mumbai.)
 - **Range:** 4,500 mi (7,200 km) at 18 knots (33 km/h; 21 mph)
 - **Length:** 163 m (535 ft)
 - **Displacement:** 6,200 tonnes (full)
 - **Aircraft carried:** 2 × Sea King Mk 42B helicopters
- **Kolkata class:**
 - **Commissioned in:** 2014
 - **Project code name:** Project 15A
 - **Build by:** MDSL
- **Project 15B:**
 - Signed in **2011**
 - Designed by the **Warship Design Bureau**
 - **Built by MDSL in Mumbai**
 - **Four ships of Project 15B:** INS Visakhapatnam, INS Mormugao, INS Imphal, and INS Surat.
 - **Lead Ship:** INS Visakhapatnam (commissioned in 2021)
- A ship 'class' describes a group of vessels of **similar tonnage, usage, capabilities, and weaponry**.
- A ship class is identified by its lead ship, in this case, **INS Visakhapatnam**.

Specifications and weaponry

- **INS Mormugao** — and the other three ships in the class — are **163 m long** and **17.4 m wide**, with a **displacement of 7,300 tonnes**.
- For comparison, the recently commissioned first indigenous aircraft carrier **INS Vikrant** is **262 m in length** and **62 m in width** and displaces around **43,000 tonnes** when fully loaded.

- It incorporates **advanced stealth features** and a **higher degree of automation**.
- The **sleeker hull design** and the **radar-transparent deck fittings** make the vessels **difficult to detect**.

32. Health Ministry asks States to hike genome sequencing for the SARS-CoV-2 coronavirus

- Due to an increase in coronavirus cases reported in China, the United States and South Korea, India's Health Ministry has asked States to bolster genome sequencing of coronavirus samples.
- According to media reports lifting of curbs in China, has resulted in a spurt in infections.
- In response, the **health ministry has asked states to gear up the whole-genome sequencing of positive case samples** to track variants through Indian Sars Cov2 Genomics Consortium (**INSACOG**) network.

About Genome:

- A genome is an **organism's complete set of DNAs**, including all of its genes.
- Each genome contains all of the information needed to build and maintain that organism.
- In humans, a copy of the entire genome—more than 3 billion DNA base pairs—is contained in all cells that have a nucleus.

Genome Sequencing:

- Genome sequencing is figuring out the order of DNA nucleotides, or bases, in a genome—the order of As, Cs, Gs, and Ts that make up an organism's DNA.
- The human genome is made up of over 3 billion of these genetic letters.
- In more simple terms, sequencing a gene is like reading a book one letter at a time to look for any spelling mistakes.

Whole genome sequencing (WGS)

- All organisms (bacteria, vegetable, and mammal) have a unique genetic code, or genome, that is composed of nucleotide bases (A, T, C, and G).
- If you know the sequence of the bases in an organism, you have identified its unique DNA fingerprint, or pattern. Determining the order of bases is called sequencing.
- Whole genome sequencing is a laboratory procedure that determines the order of bases in the genome of an organism in one process.
- WGS of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has been demonstrated to help differentiate hospital-acquired infection from community-acquired coronavirus disease (COVID-19) infection.

How does genome sequencing for Covid work?

- It involves obtaining positive COVID-19 samples and generating a complete RNA sequence of that virus from that sample.
- The complete viral genome (~30000 nucleotides) is extracted from the sample and sequenced, allowing us to read the genome of the virus.

Applications:

- Tackling Human Disease
- Uncovering the secrets of our past
- Learning about the science behind ancient medicine
- Conserving our wildlife.

Indian Sars Cov2 Genomics Consortium (INSACOG) network.

- INSACOG was established in December 2020 as a **joint initiative of the Union Health Ministry of Health and Department of Biotechnology (DBT)**.
- It aims to **expand the whole-genome sequencing of SARS-CoV-2**, the coronavirus that causes the Covid-19 disease, across India with the aim of understanding how the virus spreads and evolves.
- It functions **under the Ministry of Science and Technology** with the Council for Scientific & Industrial Research (CSIR) and Indian Council of Medical Research (ICMR).

33. US to send Patriot Missiles to Ukraine

- The U.S. will send \$1.8 billion in military aid to Ukraine in a massive package that will for the first time include a Patriot missile battery and precision-guided bombs for their fighter jets, U.S. officials said.

Patriot missile

- The Patriot is a **surface-to-air guided missile system** that was first deployed in the 1980s and can target aircraft, cruise missiles and shorter-range ballistic missiles.
- **Each Patriot battery consists of a truck-mounted launching system** with eight launchers that can hold up to four missile interceptors each, a ground radar, a control station and a generator.
- Its operational range is around 70 kilometer and the US has 16 Patriot battalions currently.
- A 2018 International Institute for Strategic Studies report found those battalions operate 50 batteries, which have more than 1,200 missile interceptors.

- The **U.S. batteries are regularly deployed around the world.**
- The Patriot system is one of the most widely operated and reliable and proven air missile defense systems and the theater ballistic missile defense capability could help defend Ukraine against Iranian-supplied ballistic missiles.

Countries with Patriot missiles

- Patriots also are operated or being purchased by the Netherlands, Germany, Japan, Israel, Saudi Arabia, Kuwait, Taiwan, Greece, Spain, South Korea, the United Arab Emirates, Qatar, Romania, Sweden, Poland and Bahrain.

Patriot Missile – Wars

- These missiles were used by the US military in Persian Gulf War, Iraq war, 2014 Israel – Gaza conflict, Syrian civil war, Yemen civil war, Saudi Arabian led intervention in Yemen, Saudi Arabian – Yemeni border conflict.

34. Japan reverse nuclear phaseout plan adopted after Fukushima:

Context:

- Japan on Thursday adopted a new policy **promoting greater use of nuclear energy** to ensure a **stable power supply amid global fuel shortages and to reduce carbon emissions, in a major reversal of its phase-out plan** following the Fukushima crisis.

More about the news:

- According to the new plan **Japan must maximize the use of existing nuclear reactors by restarting as many of them as possible and prolonging the operating life of old reactors beyond their 60-year limit, and by developing next-generation reactors to replace them.**
- The policy paper says **Japan will also push for the development and construction of “next-generation innovative reactors” with safer features to replace about 20 reactors now set for decommissioning.**
- **Nuclear energy accounts for less than 7 percent of Japan’s energy supply, and achieving the government’s goal of raising its share to 20-22 per cent by fiscal 2030 will require about 27 reactors, from the current 10.**

What happened in Fukushima Daiichi Nuclear Plant

- The Fukushima Daiichi Nuclear Power Plant is a **disabled nuclear power plant located on a 3.5-square-kilometre site in the towns of Okuma and Futaba in Fukushima Prefecture, Japan.**
- The plant suffered **major damage from the magnitude 9.0 earthquake and tsunami that hit Japan on March 11, 2011.**
- Systems at the nuclear plant detected the earthquake and automatically shut down the nuclear reactors. Emergency diesel generators turned on to keep coolant pumping around the cores, which remain incredibly hot even after reactions stop.
- But soon after a wave over 14 metres (46ft) high hit Fukushima. The water overwhelmed the defensive sea wall, flooding the plant and knocking out the emergency generators.
- Workers rushed to restore power, but in the days that followed the nuclear fuel in three of the reactors overheated and partly melted the cores - something known as a **nuclear meltdown.**
- The plant also suffered a number of chemical explosions which badly damaged the buildings. Radioactive material began leaking into the atmosphere and the Pacific Ocean, prompting the evacuations and an ever-widening exclusion zone.

35. Nasal vaccines promise to stop the COVID-19 virus

Nasal vaccines promise to stop the COVID-19 virus before it gets to the lungs – an immunologist explains how they work

Context: Researchers are in the process of developing alternative approaches to vaccines to improve their effectiveness, including how they’re administered. Immunologists at the University of Buffalo explain how nasal vaccines work.

How does the immune system fight pathogens?

- The **immune system** has two distinct components: **mucosal** and **circulatory**.
 - The **mucosal immune system** provides protection at the mucosal surfaces of the body. These include the mouth, eyes, middle ear, mammary and other glands, and the gastrointestinal, respiratory and urogenital tracts.
 - The **circulatory part of the immune system** generates antibodies and immune cells that are delivered through the **bloodstream** to the internal tissues and organs.
- The **mucosal** and **circulatory compartments** of the immune system are largely **separate** and **independent**.

What are the key players in mucosal immunity?

- The immune system generates **antibodies (Immunoglobulins)** in response to invading agents that the body identifies as “**non-self,**” such as **viruses** and **bacteria**.
- The **mucosal immune system** generates a specialized form of **antibody** called secretory **IgA**, or **SIgA**.
- **Other key players include:** different types of anti-microbial proteins that kill pathogens and immune cells that generate antibody responses.

How does the COVID-19 virus enter the body?

- The virus that causes **COVID-19, SARS-CoV-2**, enters the body **via droplets or aerosols** that get into one's nose, mouth or eyes.
- It can cause **severe disease** if it descends deep into the **lungs** and causes an overactive, inflammatory immune response.

How do nasal vaccines work?

- Vaccines can be given through **mucosal routes via the mouth or nose**.
- This induces an **immune response** through areas that stimulate the mucosal immune system, leading mucosal secretions to produce **SIgA antibodies**.
- There are **several existing mucosal vaccines**, most of them taken by mouth.
- Currently, **only one**, the **flu vaccine**, is delivered **nasally**.
- If the **SIgA antibodies** in the nose, mouth or throat target **SARS-CoV-2**, they could **neutralize the virus** before it can drop down into the lungs and establish an infection.

Advantages:

- It will block the virus at the entry point itself.
- Secretions with a sufficiently **high level of SIgA antibodies** against the virus could neutralize and thereby diminish its transmissibility.
- **Existing vaccines do not induce SIgA antibody** responses.
- Nasal vaccines may be a useful supplement to injected vaccines in hot spots of infection.
- Since they don't require needles, they might also help overcome **vaccine hesitancy** due to fear of injections.

36. Not everything we call AI is actually 'artificial intelligence'.**Generative AI:**

- Generative AI refers to **unsupervised and semi-supervised machine learning algorithms** that enable computers to use existing content like text, audio and video files, images, and even code to **create new possible content**. The main idea is to generate completely original artefacts that would look like the real deal.
- We just typed a few words prompts and the program generated the pic representing those words. This is something known as **text-to-image translation** and it's one of many examples of what **generative AI** models do.

Generative Adversarial Networks or GANs:

- technologies that can create visual and multimedia artefacts from both imagery and textual input data.
- **Text-to-image tools**, such as **Stable Diffusion, DALLÉ-2** and **Midjourney**, use **image-text pairs** from data sets such as **LAION-5B**.

Transformer-based models:

- technologies such as **Generative Pre-Trained (GPT) language models** that can use information gathered on the Internet to create textual content from website articles to press releases to whitepapers. **Example: ChatGPT, LaMDA by Google.**

Concerns with Generative AI:

- Generative AI has also produced worries about plagiarism, exploitation of original content used to create models, ethics of information manipulation and abuse of trust and even "the end of programming".

What is ChatGPT?

- **Chat Generative Pre-Trained Transformer (ChatGPT)**, is a **chatbot** developed by **OpenAI**.
- ChatGPT is built on top of OpenAI's GPT-3.5 family of large language models and is fine-tuned with both supervised and reinforcement learning techniques.
- ChatGPT can answer follow-up questions, and can also admit its mistakes, challenge incorrect premises, and reject inappropriate requests.
- Currently, it is **open in beta to all users**.
- ChatGPT has been trained to **decline 'inappropriate' requests**, presumably those which are **'illegal' in nature**.
- **ChatGPT is capable of writing fiction** but not at the level of humans.
- Other chatbots include Google-led **LaMDA**.
 - **LaMDA**, which stands for **Language Model for Dialogue Applications**, is a family of **conversational neural language models** developed by **Google**.

37. BCAS to issue technical norms within a month for new security technology

- The aviation security regulator, the Bureau of Civil Aviation Security (BCAS), is expected to issue technical norms within a month which will pave the way for airports to adopt modern equipment to screen bags without removing electronic devices.
- While the traditional x-ray machines currently used at airports produce a 2-D image, newer technologies such as

computer tomography produce a 3-D image with a higher resolution, and have better automated detection of explosives.

- They also have a low rate of the false alarms which often lead to CISF personnel requiring a physical inspection of a bag. These factors result in a higher baggage throughput (or flow) through the machine.
- Technologies such as **dual x-ray, computer tomography and neutron beam technology** will eliminate the need for passengers to remove laptops and other electronic devices.

About Computer Tomography (CT)

- A CT scan is a medical imaging technique used in radiology to get detailed images of the body noninvasively for diagnostic purposes.
- The multiple X-ray measurements taken from different angles are then processed on a computer using reconstruction algorithms to produce tomographic (cross-sectional) images (virtual “slices”) of a body.

How does it work?

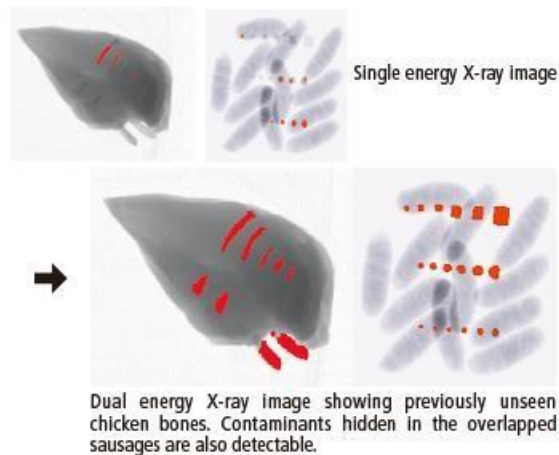
- They use a narrow X-ray beam that circles around one part of your body. This provides a series of images from many different angles.
- A computer uses this information to create a cross-sectional picture. Like one piece in a loaf of bread, this two-dimensional (2D) scan shows a “slice” of the inside of your body.
- This process is repeated to produce a number of slices.
- The computer stacks these scans one on top of the other to create a detailed image of your organs, bones, or blood vessels.
- For example, a surgeon may use this type of scan to look at all sides of a tumor to prepare for an operation.

About Neutron Beam Technology

- Neutron beams are especially useful in advanced industrial inspection, most notably for **neutron radiography, or neutron imaging**.
- A collimated neutron beamline can be used to create radiographic neutron imaging of an object’s internal structure, just as can be done with a beam of X-rays or gamma rays.
- Because neutrons have special properties compared to electromagnetic radiation **and can more easily pass through certain heavy elements than light elements**.
- Neutron radiography provides a unique perspective compared to X-ray and gamma radiography, and neutron imaging can be used to identify defects and flaws that other forms of testing might miss.
- Neutron radiography can be done with thermal or fast neutrons, which influence the neutron absorbing or scattering cross section of various materials’ atomic nuclei.
- **Neutron Sources:** Traditionally, researchers performed neutron imaging using a research nuclear reactor as the neutron source, but as nuclear reactors are more scarce with each passing decade (especially research reactors), now other neutron source options as an alternative to a nuclear reactor for neutron imaging are being developed.
- **Applications:** For this reason, neutron activation analysis sees use not only as a method in industrial non-destructive testing and materials research, but also in **areas such as art history, archaeology, geology, and agriculture. Neutron beams can even be used to detect explosives and narcotics.**

Dual X ray technology

- The Dual X-ray analyzes two X-ray signals – **both a high and low energy** – for a higher detection rate of low-density items, as well as contaminants not previously detectable by standard X-ray systems.
- The x-rays generated from an x-ray inspection system have several energy levels. The dual energy inspection system produces two different images from two different energy x-rays simultaneously.
- High energy x-rays produce a brighter image and low energy x-rays produces a darker image. By subtracting the two images acquired at different energies, the system eliminates an image having the same gray level, leaving only contaminants.
- The dual energy technology delivers the following unique features compared to conventional X-ray technology:
- Low density items can be detected.
- Even overlapping products can be inspected without false rejecting.



38. Covid pill molnupiravir does not cut hospitalisation

Covid pill molnupiravir does not cut hospitalisation, the death rate in many vaccinated adults

Context: Merck & Co Inc's COVID antiviral **molnupiravir** speeds up recovery but does reduce the hospitalisation or death rate in higher-risk vaccinated adults, detailed data shows.

Detail:

- The study, called **PANORAMIC**, compared the oral pill against standard treatment Alone in people over 50 for those aged 18 and older with underline conditions. they had been unwell with confirmed covid for five days for fever in the community setting.
- When **Merck** originally tested **molnupiravir**, it was found **30% effective in reducing hospitalizations** but that was in unvaccinated patients.

Molnupiravir:

- It belongs to a class of broad-spectrum **antiviral drugs** called **nucleoside analogues**.
- They **act by interfering with the function of viral RNA (Ribonucleic Acids) polymerases** – which are **enzymes that make new viral RNA** in infected cells.
 - **RNA** is a polymer of ribonucleotides and an important biological macromolecule that is present in all biological cells.
- It is principally involved in the synthesis of proteins, carrying the **messenger instructions** from **Deoxyribonucleic acid (DNA)**, which itself contains the genetic instructions required for the development and maintenance of life.
- It **works by causing viruses to make errors** when copying their own RNA, introducing mutations that inhibit replication.
- It was **initially invented as a drug for the influenza virus**.

Mechanism:

- These drugs work by **preventing the process of replication of the virus** inside human cells.
 - A **virus is a biological agent** that can **self-replicate inside a host cell**. The infected cells by viruses may produce thousands of new copies of the original virus at an extraordinary rate.

It alters **critical enzymes** that were necessary to the virus for replicating in the human body cells.

39. Dark Patterns

- Recently, it is been found that some Internet –based firms have been tricking users into agreeing to certain conditions or clicking a few links.
- Different Big Tech companies, like Apple, Amazon, Skype, Facebook, LinkedIn, Microsoft, and Google, employ dark patterns to downgrade the user experience for their own benefit.

About Dark Patterns:

- It is a **user interface that has been crafted to trick or manipulate users into making choices** that are **detrimental to their interests**.
- The term 'Dark Patterns' was coined by user experience designer Harry Brignull in 2010.
- Dark patterns endanger the experience of internet users and make them more vulnerable to financial and data exploitation by BigTech firms.
- Dark patterns confuse users, introduce online obstacles, make simple tasks time-consuming, have users sign up for unwanted services or products and force them to pay more money or share more personal information than they intended.
- In the U.S., the Federal Trade Commission (FTC) has taken note of dark patterns and the risks they pose. In a report released in September, 2022, the regulatory body listed over 30 dark patterns.

- The FTC report outlined its legal action against Amazon in 2014, for a supposedly free children's app that fooled its young users into making in-app purchases that their parents had to pay later for.

Types of dark patterns

- In India, The Advertising Standards Council of India (ASCI) has recognised four dark patterns and these are the proposed areas of extension to the ASCI code on misleading ads.
- **Drip pricing:** It is a pattern when the total price is only revealed at the very end of the buying process.
- **Bait and switch:** It is a pattern that occurs when a user takes an action expecting one outcome, but instead is served an outcome they didn't want.
- **False urgency:** It is a dark pattern that refers to misleading information on quantities of a particular product.
- **Disguised advertising:** It is a pattern when an advertisement mimics editorial content.

How do dark patterns affect user experience?

- Dark patterns jeopardise Internet users' experiences and increase their susceptibility to data and financial exploitation by Big Tech companies.
- Dark patterns trick consumers, present online barriers, lengthen the completion of routine tasks, get them to sign up for undesirable services or products, and coerce them into paying more money or disclosing more personal information than they had originally meant.
- According to the FTC, dark patterns will likely follow augmented reality (AR) and virtual reality (VR) platforms and devices as they grow in usage.

40. Drugmaker Hetero is first generic to get WHO pre-qualification approval

Context:

- Drug maker Hetero said it has received World Health Organization (WHO) prequalification approval for its generic version of Pfizer's Covid-19 oral antiviral treatment candidate nirmatrelvir.
- Hetero's combi-pack **Nirmacom will contain nirmatrelvir 150 mg (2 tablets) and ritonavir 100mg (1 tablet).**
- WHO made a strong recommendation for nirmatrelvir and ritonavir for mild and moderate Covid-19 patients at the highest risk of hospital admission, such as unvaccinated, aged or immunosuppressed patients.
- Hetero has already received Emergency Use Authorization (EUA) approval from the Drugs Controller General of India (DCGI) to manufacture and market Nirmacom. (eom).

WHO Pre-qualification approval

- A **WHO pre-qualification, or Emergency Use Listing (EUL)**, is necessary for a vaccine company to supply vaccines to global facilities such as COVAX or international procurement.
- The WHO Emergency Use Listing Procedure (EUL) is a risk-based procedure for assessing and listing unlicensed vaccines, therapeutics and in vitro diagnostics with the ultimate aim of expediting the availability of these products to people affected by a public health emergency.

To be eligible, the following criteria must be met:

- The disease for which the product is intended is serious or immediately life threatening, has the potential of causing an outbreak, epidemic or pandemic and it is reasonable to consider the product for an EUL assessment, e.g., there are no licensed products for the indication or for a critical subpopulation (e.g., children).
- Existing products have not been successful in eradicating the disease or preventing outbreaks (in the case of vaccines and medicines).
- The product is manufactured in compliance with current Good Manufacturing Practices (GMP) in the case of medicines and vaccines and under a functional Quality Management System (QMS) in the case of IVDs.
- The applicant undertakes to complete the development of the product (validation and verification of the product in the case of IVDs) and apply for WHO prequalification once the product is licensed.

Emergency Use Authorization (EUA) in India

- Vaccines and medicines, and even diagnostic tests and medical devices, require the approval of a regulatory authority before they can be administered.
- In India, the regulatory authority is the **Central Drugs Standard Control Organization (CDSCO).**
- The approval is granted after an assessment of their safety and effectiveness, based on data from trials. In fact, approval from the regulator is required at every stage of these trials.
- This is a long process, designed to ensure that medicine or vaccine is absolutely safe and effective.
- The fastest approval for any vaccine until now — the mumps vaccine in the 1960s — took about four-and-a-half years after it was developed.

Accelerated Approval Process in India

- Under this process, a new drug is approved based on data generated in clinical trials. The Rules provide a relaxation for skipping Phase III clinical trials, which crucially test for a vaccine or drug's efficacy in preventing disease in the

local population.

- Phase III trial is allowed to be skipped if ‘remarkable efficacy’ is observed with a defined dose in the Phase II clinical trial of the new drug.
- The regulator can then also grant market approval for the new drug or vaccine based on Phase II data to meet what the Rules call ‘unmet medical needs of serious and life-threatening diseases in the country’.
- The Rules also state that in such cases, additional studies ‘may’ be required after approval to generate data on a larger population to verify its benefits.
- Unmet medical needs essentially mean a situation where treatment or diagnosis of disease is not addressed adequately with the available therapy.
- Further, the Rules provide for relaxations for unapproved or imported drugs or vaccines. The regulator relies on clinical trial data generated abroad to approve the vaccines in such scenarios and additional non-clinical or clinical data may be required to back the claims.

Exceptions for emergency

- In emergency situations, like the current one, regulatory authorities around the world have developed mechanisms to grant interim approvals.
- However, there should sufficient evidence to suggest a medical product is safe and effective.
- Final approval is granted only after completion of the trials and analysis of full data; until then, EUA allows the medicine or the vaccine to be used on the public.
- India’s drug regulations do not have provisions for a EUA, and the process for receiving one is not clearly defined or consistent.

41. Leveraging voice technology to combat cyber-fraud

Cyber-fraud: It is a situation in which someone uses the internet to get money, goods, etc. from people illegally by tricking them: Not only does cyber fraud inflict losses on the cardholders, but also the merchants, merchants' banks, and card issuers.

Cyber frauds in India:

- According to data by the **Reserve Bank of India**, frauds have cost the country an estimated **₹100 crore a day** over the last **seven years**.
- The frauds reported in **2021-22** were **23.69% higher** than in the previous year (9,103 cases reported compared to 7,359 in 2020-21), although there was a **decline in the amount involved**.
- The **main reasons** for the **rise in fraud** include greater use of digital payments, telephone banking, and online banking services.
- Growing fraud also means **rising losses for financial institutions** and **increasing cases for law enforcement** to solve.

An emerging technology to tackle cyber fraud:

- This technology is known as **Adopting Voice Technology (VT)**.
- It encompasses voice biometrics or voice/speech recognition technology.
- it uses the unique characteristics of a person’s voice as identification.
- The technology **creates a digital voiceprint** and compares it to a caller’s voice.
- **Voice authentication** can significantly **improve security** over **knowledge-based authentication** methods, which fraudsters have exploited to scam people.

Benefits of this technology:

- Compared to other **biometrics**, **voice use** is the **cheapest technology**, and does not require a reader or special device.
- It is also **non-invasive**, **portable** and affords **remote identification**.
- Although banks have traditionally relied on the use of passwords, passwords are the weakest link in security (81% of hacking-related breaches involve weak passwords).
- Unlike a password, a **customer’s voice is impossible to spoof or copy**, and is far more challenging to hack.
- VT verifies a caller swiftly in seconds by analysing the caller’s voice and flags suspicious calls. VT allows privacy because it does not require users to reveal personal information.
- **Voice biometrics** can help **financial institutions to ensure higher levels of protection** for customers and employees.

Prospects of the voice biometrics industry:

- In February **2019**, **HSBC** became the **first bank** to take the revolutionary leap in introducing **voice recognition for mobile banking customers** — telephone banking fraud cases fell by over **50%**.
- The **voice biometrics industry** is growing exponentially now.

- Experts expect the market to reach a **market size of \$3.9 billion by 2026**, with a **compound annual growth rate of 22.8%**.

Growing applications:

- An essential tool for **forensics** and **law enforcement**.
- Airport security as voice biometric has a lower error rate than face recognition technology.
- It also has the ability to resist playback attacks.
- It is sensitive enough to detect if someone is impersonating the user or playing a recording.
- It can identify even if the user has a cold or a sore throat.
- Disbursal of money for various schemes
- Verify the proof of life of pensioners from their homes.

VT has the advantage:

- improving user experience
- reducing call handle time
- call centre costs

Disadvantages:

- **May not be 100% fool proof**, may give false positives, and has an **accuracy between 90% and 99%**.
- But some recent systems which come with voice analytics of gender and age identification, **claim 100% verification accuracy**.

42. GSAT communication satellite costing Rs 508 crore unused for half its lifetime: CAG report


Context:

- A lack of coordination between the **Department of Space (DoS)** and the **Defence Research and Development Organisation (DRDO)** led to the underutilisation of the **GSAT-6 satellite**, according to the **Comptroller and Auditor General of India (CAG)** report released December 23, 2022.

About the GSAT-6 satellite:

- The **communication GSAT-6 satellite** was launched in **2015** at a cost of **Rs 508 crore**.
- It was **designed** to provide communication through the **S-band** and a national beam in the **C-band** for **strategic users**, according to the **Indian Space Research Organisation (ISRO)**.
 - The **S** and **C** bands are part of the **microwave spectrum**, which includes frequencies ranging from **1 gigahertz to over 100 GHz**.
- **GSAT-6** had **two main components**:
 - The **space segment** and the **ground segment**.
 - **DOS** was responsible for **realising and launching the satellite**, while **DRDO** was responsible for the **ground segment**.
 - Under the revised utilisation plan, it was proposed to utilise the space segment capacity for meeting the communication needs of the strategic and societal sectors.

GSAT-6 was expected to last for **12 years** from **2015**. But it was left unused for half its lifetime.



LAQSHYA 2023

TEST BASED MENTORSHIP FOR CSE PRELIMS 2023


UNION PUBLIC SERVICE COMMISSION
MARKSHEET

Civil Services (PRELIMINARY) Examination, 2016

Roll Number	0029983
Name	SANTOSH PANDEY
Marks Obtained	
Paper I	144.66
Paper II	107.50

REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION, 2016

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Santosh Sir
CRACKED ALL 6 PRELIMS

NCERT LEVEL TEST - 11

ADVANCED LEVEL TEST - 16

MONTHLY CURRENT AFFAIRS TEST - 15

ENTIRE YEAR IMP QUESTION TEST (SUBJECT-WISE) - 8


FULL LENGTH STIMULATED TEST - 10

C-SAT Test - 10


➔

TOTAL NO. OF TEST - 70


More than 70 questions in CSE PRELIMS 2022
Paper came from LAQSHYA 2022




Priyanka S (IAS)



Kalpesh Sharma (IAS, IFos)



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ENVIRONMENT

1. COP15 Montreal: Asia must speed up its protected area coverage 6 times to meet the 30X30 goal

Context-

- Asia is not likely to meet the ambitious **30X30 goal** proposed under the **Post 2020 Global Biodiversity Framework** of the **Convention on Biological Diversity (CBD)**, according to new research released November 29, 2022.

Research findings-

- Countries have to commit to protecting **30 per cent** of the land and sea by **2030** under this goal.
- Most Asian countries have failed to achieve even the **global minimum target** of protecting at least **17 per cent** of land by **2020**.
- Only 40 per cent** of **Asian countries** achieved the target of a **minimum of 17 per cent coverage** for protected areas by 2020.
- Asian countries** managed to protect barely **13.2 per cent of land in 2020**, compared with a **global average of 15.2 per cent** protection.
- The target of **17 per cent** is part of the **20 Aichi Targets** set at the **2010 UN CBD**.
- Countries in **Asia** also have a **slower year-on-year increase** in the amount of land protected for conservation, at just **0.4 per cent per year** on average.
- Some countries showed **no change** while others showed a **decrease in protected area coverage**.
- Countries with larger areas under agricultural land in 2015 had a lower protected area coverage in 2020.
- Only 7 per cent** of protected areas in Asia had any kind of assessment for their management effectiveness.
- Under the current trajectory, Asia as a whole would only achieve **18 per cent** coverage by **2030**.
- Within Asia, west and south Asia are likely to achieve **only 11 per cent** and **10 per cent** coverage respectively by 2030.

About 30X30 target-

- The **30X30 target** was first floated in **2019** in an **article A Global Deal for Nature: Guiding principles, milestones, and targets published in Science Advances**.
- This then became the global call of the **High Ambition Coalition for Nature and People** in 2020 and as of October 2022, more than **100 countries** are part of it.

Challenges in achieving the target-

- The target has been dubbed '**the biggest land grab in history**' which will take away land and livelihood from **300 million people**, many of them tribal and indigenous peoples.
- Human rights experts fear that if the world pushes the proposed target, indigenous communities would have lower access to the areas.
- The indigenous peoples' lands accounted for **30 per cent** of the primate range, and **71 per cent** of primate species inhabited these lands.

2. The battle to bring freshwater turtles back from the brink

What is Turtle Survival Alliance?

- The Turtle Survival Alliance (TSA) was **formed in 2001** as an **International Union for Conservation of Nature (IUCN) partnership** for sustainable **captive management of freshwater turtles and tortoises**.
- The TSA arose in response to the rampant and unsustainable harvest of Asian turtle populations to supply Chinese markets, a situation known as the **Asian Turtle Crisis**.
- Mission: '**Zero Turtle Extinctions in the 21st Century**'.

Status of Turtle in India:

- India has **29 species of freshwater turtles (24) and tortoises (5)**.
- More than **half of the turtle species** are **threatened** and **11 are protected under Schedule I of The Wildlife Protection Act**, enjoying the same protection as tigers.
- The three **critically endangered turtles** are being conserved as a **part of TSA India's research**, conservation breeding and education programme in different parts of the country.
 - The Northern River Terrapin** (Batagur baska) is being conserved at the **Sunderbans**;
 - The Red-crowned Roofed Turtle** (Batagur kachuga) at **Chambal**;
 - The Black Softshell Turtle** (Nilssonia nigricans) at different temples in **Assam**.

What is the difference between Turtle and Tortoise:

- The main difference between the two is that **turtles are primarily aquatic** whereas **tortoises are terrestrial and spend more time on land**.

What is Wildlife Crime Control Bureau?

- The Wildlife Crime Control Bureau is a **statutory multi-disciplinary body under the MoEFCC created in 2007** under the **provisions of the Wildlife Protection Act 1972**.
- Wildlife Crime Control Bureau is **designated nodal agency for CITES related enforcement**.
- The Bureau has its **five regional offices at Delhi (headquarters), Kolkata, Mumbai, Chennai and Jabalpur**; and **five border units at Ramanathapuram, Gorakhpur, Motihari, Nathula and Moreh**.
- It has received the **Asia Environmental Enforcement Award-2020** awarded by the **United Nations Environment Programme (UNEP)**.
- Under the Wild Life (Protection) Act, 1972, WCCB is **mandated to**:
 - a) **Collect and collate intelligence** related to organized **wildlife crime**;
 - b) Disseminate the same to State and other enforcement agencies so as to **apprehend the criminals**;
 - c) **To establish a centralized wildlife crime data bank**;
 - d) **Coordinate actions by various agencies** in connection with the enforcement of the provisions of the Act;
 - e) **Assist international organizations & foreign authorities** to facilitate wildlife crime control;
 - f) **Capacity building** of the wildlife crime enforcement agencies;
 - g) **Assist State Governments to ensure success in prosecutions** related to wildlife crimes; and
 - h) **Advise the Government of India** on issues relating to **wildlife crimes**.
- i) It also **assists and advises the Customs authorities in inspection of the consignments of flora & fauna** as per the provisions of **Wild Life Protection Act, CITES and EXIM Policy** governing such an item.

Various Wildlife Crime Control Bureau (WCCB) led operations:

- **Operation “Save Kurma”** to focus on the **poaching, transportation and illegal trade of live turtles and tortoises**.
- **“Operation Turtshield- I” and “Operation Turtshield-II”** were taken up to **tackle the illegal trade of live turtles**.
- **Operation “Lesknow”, “Lesknow-II” and Operation “Lesknow-III”** to gain **attention of enforcement agencies** towards the **illegal wildlife trade** in lesser-known species of wildlife.
- **Operation Clean Art** to draw **attention of enforcement agencies** towards **illegal wildlife trade in Mongoose hair brushes**.
- **Operation Soft gold** to tackle **Shahtoosh Shawl made from Chiru wool** illegal trade and to spread **awareness among the weavers and traders** engaged in this trade.
- **Operation Birbil** to curb **illegal trade in wild cat and wild bird species**.
- **Operation Wildnet, Operation Wildnet-II, Operation Wildnet-III and Operation Wildnet-IV** to draw the **attention of the enforcement agencies** within the country to focus their **attention on the ever-increasing illegal wildlife trade over internet using social media platforms**.
- **Operation Freefly** on illegal trade of live birds
- **Operation Wetmark** to ensure **prohibition of sale of meat of wild animals in wet markets across the country**

3. Kanger Ghati National Park

Context: Bird watchers and forest department officials counted 200 types of birds in Chhattisgarh’s first-ever inter-state bird survey conducted in the Kanger Valley National Park

Concept:

Kanger Ghati National Park (also called Kanger Valley National Park) in Chhattisgarh state was declared a national park in 1982 by the Government of India

Terrain:

- It is one of India's **densest national parks**
- The total area of the national park is 200.00 km² (77.22 sq mi). The valley starting from the **Tirathgarh waterfalls to the Kolab River** (Odisha State boundary)
- The park is Valley of **Kanger River**. The river flows from NW to SE direction centrally through deep gorges
- The national park comprises two ranges viz: **Kotamsar(in the west) and Koleng Ranges(in the east)**
- There are 48 villages within 5 km radius of national park boundary and only one forest village (Kotamsar) is inside the national park
- The national park is known for the long **subterranean geomorphological limestone caves**. These are **Kotamsar cave, Kailash Cave, Dandak Cave, Devgiri Cave**.

Flora and Fauna

- The flora in the park consists chiefly of **mixed moist deciduous type** of forests with predominance of **sal, teak and bamboo trees**.
- It is home of the **Bastar hill myna, the state bird of Chhattisgarh**. Other avian fauna at the park includes spotted owl, red jungle fowl, racket-tailed drongos, steppe eagles, red spurfowl, phakta, bhura teeter, tree pie and heron

- **Kariya Ama Nallah** is a perennial marshy belt and is ideal habitat for the **wild boar, sloth bear, chital, leopard and tiger, Chital, barking deer, and panther** are mainly found in this marshy area.
- Other Major wildlife of the Kanger Valley National Park are tigers, leopards, mouse deer, chital, sambar, barking deer, langurs, flying squirrel, wild boar, striped hyena, pythons' crocodiles, monitor lizards and snakes.

4. Rice, integral to Madagascar, may be hastening the decline of its unique biodiversity;

Context-

- **Rice**, the main food crop of **Madagascar**, could be hastening the **deforestation** and **loss of biodiversity** in the fourth-largest island of the world due to the practice of shifting agriculture, according to two exhaustive studies published in the Science journal.

More on the news-

- **Study named-** Madagascar's extraordinary biodiversity: Evolution, distribution, and use
- **Climate change** has **wrought havoc** on the **island**, with the latest being **Tropical Storm Ana** earlier this year.

Rice and zebu cattle-

- **Rice cultivation** was brought a millennium ago to Madagascar by Austronesian peoples.
- **Rice** is integral to **Malagasy cuisine**. On average, each Madagascan eats 120 kilograms of rice or varies per year.

Change in Madagascar's landscape-

- **Rice** is currently widely cultivated both in the **Central Highlands** (using paddy production) and in the **humid east**, where **swidden agricultural methods** are used (ie, shifting cultivation involving clearing forest for conversion to cropland, usually by burning).
- **Slash-and-burn cultivation** depleted soils rapidly.
- This caused farmers to abandon land for long fallow periods with further vegetation being cleared at a new location.
- Agriculture primarily led to deforestation on the island. Some **44 per cent** of the land covered by native forest in **1953** was deforested by **2014**.
- The **rate of deforestation** has steadily increased.
- It was **99.0 kilohectare per year** between 2010 and 2014 and **72.9 Kha/per year** from **2014-2020**.
- **Deforestation** in Madagascar reflects **global patterns** and is primarily driven by the small-scale but widespread practice of **swidden agriculture** (also known as **shifting cultivation**; in Madagascar referred to as **tavy for rice cultivation** in **humid and subhumid areas** and **hatsake for cassava and maize** in **dry and sub-arid areas**).
- Additionally, **cash crop production**, particularly **maize** and **peanut**, had become a **major driver of deforestation** alongside the production of products for international markets, such as forest-derived **vanilla**.
- **Natural system** modifications add to deforestation.
- They threaten **23.2 per cent** of vertebrates and **68.9 per cent** of plants.
- **Some predictions** indicate that in the absence of an **effective strategy** against **deforestation**, **38 to 93 per cent** of **forest** present in **2000** will be no longer present in **2050**.

Madagascar is a biodiversity hotspot-

- Most of the **plants, animals, insects and fungi** found on the island are found nowhere else in the world.
- Some **56 per cent** of the **island's birds**, **81 per cent** of **freshwater fishes**, **95 per cent** of **mammals**, and **98 per cent** of **reptile species** are **endemic**.
- **Madagascar**, along with **India**, was **part of Gondwana**, one of **two supercontinents** formed millions of years ago.
- **South America, Africa and Australia** too were part of the great landmass.
- **Madagascar** later **split** and moved till it reached its present position in the **Indian Ocean**, separated from **Africa** by the **Mozambique Channel**.
- This relative isolation enabled the high endemism among its biota.

5. World Soil Day: 5 December

About-

- It was recommended by the **International Union of Soil Sciences (IUSS)** in **2002**.
- The **Food and Agriculture Organisation (FAO)** has supported the formal establishment of **WSD** as a global awareness-raising platform under the leadership of the **Kingdom of Thailand** within the framework of the **Global Soil Partnership**.
- **5th December 2014** was designated as the **first official WSD** by the **UN General Assembly (UNGA)**.
- 5th December was chosen because it corresponds with the official birthday of **H.M. King Bhumibol Adulyadej**, the **King of Thailand**, who officially sanctioned the event.

FAO gives two awards in line with this day:

- **The King Bhumibol World Soil Day Award:** An annual award that honours individuals, communities, organizations and countries that organized remarkable and engaging World Soil Day activities or campaigns in the previous year.
- **The Glinka World Soil Prize:** An annual award for dynamic change-makers dedicated to solving one of our world's most pressing environmental issues: soil degradation.
 - It honours individuals and organizations whose leadership and activities have contributed, or are still contributing to the promotion of sustainable soil management and the protection of soil resources.

Soils: where food begins

- Soil is made up of **organisms, minerals, and organic components** that provide food for humans and animals through plant growth.
- Soils need a balanced and varied supply of nutrients in appropriate amounts to be healthy. Agricultural systems lose nutrients with each harvest, and if soils are not managed sustainably, fertility is progressively lost, and soils will produce nutrient-deficient plants.
- **Soil nutrient loss is a major soil degradation process threatening nutrition.**
- Over the last 70 years, the level of vitamins and nutrients in food has drastically decreased, and it is estimated that 2 billion people worldwide suffer from a lack of micronutrients, known as **hidden hunger** because it is difficult to detect.
- **Soil degradation** induces some soils to be nutrient depleted losing their capacity to support crops, while others have such a high nutrient concentration that represent a toxic environment to plants and animals, pollute the environment and cause climate change.
- **World Soil Day 2022** (#WorldSoilDay) and its campaign "**Soils: Where food begins**" aims to raise awareness of the **importance of maintaining healthy ecosystems** and human well-being by addressing the growing challenges in soil management, increasing soil awareness and encouraging societies to improve soil health.

Important facts-

- 95% of our food comes from soils.
- 18 naturally occurring chemical elements are essential to plants. Soils supply 15.
- Agricultural production will have to increase by 60% to meet the global food demand in 2050.
- 33% of soils are degraded.
- Up to 58% more food could be produced through sustainable soil management.

6. Green customs initiative-

- The **Green Customs Initiative**, launched in **2004**, is an **unprecedented informal partnership of international organisations** cooperating to prevent the illegal trade in **environmentally-sensitive commodities** and substances and to facilitate legal trade.
- Its **objective** is to enhance the capacity of customs and other relevant border control officers to monitor and **facilitate legal trade** and to **detect and prevent illegal trade** in environmentally sensitive commodities covered by the relevant conventions and **multilateral environmental agreements (MEAs)**.
- These commodities include **ozone-depleting substances (ODS), toxic chemicals, hazardous wastes, endangered species and living-modified organisms**.
- This is achieved through **awareness-raising** on all relevant international agreements as well as the provision of assistance and tools to the customs community.
- **Green Customs Initiative** is designed to complement and enhance existing customs training efforts under the respective agreements.
- The **Green Customs Initiative** provides opportunities for **coordinated and cost-effective development of tools**, delivery of training and awareness-raising of customs officers and other border control officers through its umbrella partnership involving multiple organisations with diverse mandates.
- **Customs administrations** need and regularly request coordinated training such as that delivered under the **Green Customs Initiative**.
- Such coordinated training is not provided through other means.

7. Rajaji National Park

Context: Underlining that “conservation priority of the forest area far outweighs the commercial transport needs of the state government”, the Central Empowered Committee (CEC) of the Supreme Court has recommended against blacktopping a 4.7-km stretch of a key forest road in the buffer zone of Uttarakhand's Rajaji tiger reserve.

Rajaji National Park

- It is nestled between the Shivalik ranges and the Indo-Gangetic plains.

- Broadleaved deciduous forests, riverine vegetation, scrubland, grasslands and pine forests form the range of flora in this park.
- The park is spread over three districts of Uttarakhand: Haridwar, Dehradun and PauriGarhwal.
- The **Ganga and Song rivers** flow through the park.
- It is at the north western limit of distribution for both elephants and tigers in India and has the largest population of elephants in Uttarakhand.
- The Park is also home to the **Great Pied Hornbill, Himalayan Pied Kingfisher and the fire tailed sunbird**.
- This area is the first staging ground after the migratory birds cross over the Himalayas into the Indian subcontinent.
- In 2015, Rajaji National Park was notified as a tiger reserve by the central government. Benefits of Tiger Reserve – Protected area for Tigers, Tourist attraction, Huge Development fund for the park, Eco-Tourism development

8. A dangerous pesticide isn't being monitored in key bird of prey populations

A dangerous pesticide isn't being monitored in key bird of prey populations — we're shedding light on that gap

Context- DDT is known for its devastating effects on the environment, as well as animal and human health.

About DDT-

- It was **first used in the second world war** to protect Allied soldiers against malaria and typhus, which are spread by mosquitoes and body lice. Thus, considered as **miracle chemical**.
- Its insecticidal properties were discovered in **1939** by a **Swiss chemist, Paul Hermann Müller** and he won a **Nobel Prize for medicine** for discovering the uses of DDT.
- It became a widely available pesticide to kill insect crops pests and insects causing disease in humans.
- Continued exposure to the chemical can cause **neurological damage, endocrine disorders and reproductive failure** in both humans and animals.

Awareness about the harmful effect of DDT-

- **Rachel Carson's book Silent Spring**, published in **1962**.
- **Silent Spring** brought global attention to **DDT's environmental impacts** and sparked a public outcry that forced much of the developed world – the “**global north**” – to ban the **use of DDT** in the **1970s and 1980s**.
- In **2004** the **Stockholm Convention on Persistent Organic Pollutants** – those that stay in the environment for a long time after use – was adopted by over **90 nations**.
- **DDT** was among the **most dangerous pesticides, industrial chemicals and by-products** placed on the convention's “**dirty dozen**” list, and was banned in most parts of the world.
- Two years later the **World Health Organization** recommended the **restricted use of DDT to control malaria**.
- It **remains in use** for this purpose in various tropical countries in Asia, Africa, and South and Central America.
- Its use here put the human as well as raptors health at risk.

Birds of prey as sentinels-

- Being at top of the food chain they can act as an “**ecological barometer**”, helping us gauge the health of the environment.
- In addition to their value as **indicator species**, they provide valuable **ecosystem services, controlling pest animals** such as **rodents** and removing carrion from the environment, potentially reducing the spread of disease.
- Because **DDT** accumulates in wildlife and magnifies up the food chain, many raptor populations were nearly wiped out by its use.
- However, this **bio-accumulation** also means they have the potential to serve as a useful indicator to monitor levels of DDT in the environment.
- Thus, raptors can be regarded as **sentinels for DDT**.

A global north bias

- **DDT** monitoring in raptors is heavily biased toward the global north. **Europe and North America** account for **95% of samples**.
- This is a concern because most **DDT** use is currently in the **global south**, as are most raptor species.
- Just three species account for half of all raptor samples collected: **bald eagle, Eurasian sparrowhawk and peregrine falcon**.
- Only the **peregrine falcon** occurs on all continents, but have been sampled far less in Africa, Asia, Central and South America than Europe and North America.
- The **Eurasian sparrowhawk** is also found in Asia but similar to the peregrine has been sampled far less frequently there than in Europe.

And it's worrying for three reasons-

- Most current **DDT use** is in the **global south** because of the chemical's role in malaria control.
- The region is home to most of the world's raptors. There are also many declines of species in these regions.
- Many countries in the global south are notoriously poor enforcers of environmental legislation.

9. Loss, decay and bleaching:

Why sponges may be the 'canary in the coal mine' for impacts of marine heatwaves

Context- Marine sponges were thought to be more resilient to ocean warming than other organisms. But earlier this year, **New Zealand** recorded the **largest-ever sponge bleaching event** off its southern coastline.

About sponges-

- Like corals, sponges contain **symbiotic organisms**.
- **Cymbastella lamellata** is unusual in that it hosts dense populations of **diatoms**, small single-celled photosynthetic plants that give the sponge its brown colour.
- These **diatoms** live within the **sponge tissue**, exchanging food for protection.
- When the sponge bleaches, it expels the diatoms, leaving the sponge skeleton exposed.
- Tissue loss occurs when sponges are stressed and either have to invest more energy into cell repair or when their food source is depleted and they reabsorb their own tissue to reduce the body volume and reallocate resources.
- **Tissue decay** or **necrosis** is generally associated with changes in the **microbial communities** living within sponges and the growth of **pathogenic bacteria**.

Significance of sponges-

- **Sponges** are among the most ancient and abundant animals on rocky reefs across the world.
- They filter large quantities of water, capturing small food particles and moving carbon from the water column to the seafloor where it can be eaten by bottom-dwelling invertebrates.
- These invertebrates are consumed by organisms further up the food chain.
- Provides **habitat** for a range of other species such as crabs, shrimps and starfish.

Recent event of Sponge bleaching-

- Observed on the southern coastline of the New Zealand, while the bleaching is not being observed in central areas of New Zealand's coastline.
- One species viz the **cup sponge Cymbastella lamellata** was affected due to a prolonged marine heatwave.
- A **marine heatwave** is defined as an event when **seawater temperatures** exceed a seasonally-varying threshold (usually the 90th percentile) for **at least 5 consecutive days**. Successive heatwaves with gaps of 2 days or less are considered part of the same event.

10. Over 100 experts oppose 'Nature Positive Fund' in open letter to UN before COP15

Context-

- A hundred and nineteen experts from academia and civil society have called on the United Nations (UN), World Economic Forum (WEF), European Commission (EC) and World-Wide Fund for Nature to reject the '**Nature Positive Fund**' at the **15th Conference of Parties (COP15)** to the **Convention on Biological Diversity (CBD)** in **Montreal, Canada**

What is 'Nature positive'-

- **Nature-positive** is the term used to describe a world where nature – species and ecosystems – is being **restored** and is **regenerating** rather than declining.
- A **nature-positive economy** is one in which businesses, governments and others act at scale to minimise and remove the drivers and pressures fuelling the degradation of nature, to actively improve the state of nature itself and to boost nature's contribution to society.
- Under the **UN Convention on Biodiversity** governments from around the world are negotiating a **new Global Goal for Nature** which is set to include the target that the world should be **nature-positive by 2030** in order that **nature may fully recover by 2050**.
- A fund is proposed for this purpose, known as '**Nature positive fund**'.

Concerns highlighted are-

- Financialization of nature's destruction, via a monetary valuation of ecosystems, biodiversity offsetting and diverting the conversation away from the need to curb biodiversity destruction and towards 'sustainable' finance regulation.
- Criticism against the call for "recognize the value of nature", "start valuing nature in economic transactions," "complementary measures of economic progress, including natural capital" and references to the Dasgupta review on **the economics of biodiversity (TEEB)**.

- Most valuation models only valued a few main ecological functions and ignored the rest as a result, the monetary values being produced do not represent the value of nature's ecological functions.
- Offsetting has also led to **land-grabbing of indigenous land** in poor countries, causing human rights abuses, as a form of **green neo-colonialism**.
- Idea of **nature positive fund** empowers **private finance** and **financial markets** that will downplay the power of governments to set up appropriate regulations.

What is The Economics of Ecosystems and Biodiversity (TEEB)?

- From **2007 to 2011**, **Pavan Sukhdev** led a research called **The Economics of Ecosystems and Biodiversity (TEEB)**.
- It is a **global campaign** to raise awareness of the **global economic advantages of biodiversity**.
- Its **goal** is to emphasise the rising cost of biodiversity loss and environmental degradation, as well as to bring together experts from science, economics, and policy to allow meaningful solutions.
- Estimates show that biodiversity and environmental loss would cost **18 percent of global economic output by 2050**.
- The **World Bank**, in particular, has recently spearheaded efforts to reflect the cost of biodiversity loss and climate change in national accounts.
- **Objective**
 - Highlight the rising costs of biodiversity loss and ecosystem degradation, as well as bring together experts from science, economics, and policy to enable practical actions.
- **TEEB – Aims**
 - To assess, communicate, and mainstream the urgency of actions through five deliverables:
 - Science and economic foundations, policy costs, and costs of inaction
 - Policy options for national and international decision-makers
 - Decision-making assistance for local administrators
 - Business Risks, opportunities and metrics
 - Citizen and consumer ownership

TEEB and India-

- The **Ministry of Environment and Forests** has launched the **Economics of Ecosystems and Biodiversity TEEB-India Initiative (TII)** to highlight the economic consequences of biological diversity loss and the resulting decline in ecosystem services.
 - The Initiative concentrated its efforts on **three habitats**: forests, inland wetlands, and coastal and marine ecosystems.
 - TII has been implemented as a technical collaboration with GIZ under the Indo-German Biodiversity Programme.
 - The pilot project results will be incorporated into the sectoral synthesis for the three ecosystems.
 - It was unveiled during the **Brazil-India-Germany TEEB Dialogue**, which India hosted in September 2015.
- The entire research result was issued at the **21st session of the UNFCCC CoP**, which was held in **Paris** in November-December **2015**.

11. Calculating the Internet's hidden carbon footprint

Cloud video streaming be as bad for the climate as driving a car?

Context- International Energy Agency (IEA) published a report- "**Data Centres and Data Transmission Networks**" As per the report-

- The estimate is based on **quantitative information** — the **electrical energy** and the **amount of data used**.
- Driving a small car to the movie theatre may have lower carbon emissions than streaming the same movie alone at home. A **two-hour film pollutes as much as a 45-minute car drive**.
- In **2002**, global Internet usage was just **156 GB**. Twenty years later, traffic is approximately **150,000 GB per second**, nearly a thousand-fold increase.
- The annual energy consumption of information and communication technology infrastructure is constantly at least **2,000 TWh, 5 per cent** of the global electricity use.
- Projections suggest that we will reach **10 per cent by 2030**.

Suggestions provided are-

- Turn off the camera when not needed in a video call.
- Decrease the video resolution when possible, particularly on small screens.
- Watch movies when they are broadcast rather than using on-demand services, which require dedicated computational power and data for each viewer.

- Finally, let's start thinking in **kWh** about everything we do, and do our part to help the implementation of such a standard. In this way, we will talk with the same energy currency, as we do with money.
- Set up individual "energy wallets" and decide how to spend what we have in a sustainable way.

12. Life of plastic:

Life of plastic: Kenya, South Africa announce 'just transition' initiative for waste-pickers

The Just Transition initiative (JTI)-

- The **Just Transition initiative** "seeks to foster the element of a just transition within the letter and spirit of the proposed **legally binding instrument**."
- **Launched by-**
 - Kenya and South Africa, in the aftermath of negotiations on a **global treaty to end plastic pollution**.
- **Aim-**
 - To end plastic pollution in a way that is as fair and inclusive as possible to everyone concerned.
 - To create decent work opportunities for waste-pickers and other workers in the plastic value chain.

What is Just Transition?

- A just transition is based on making visible those already working at all stages of the plastic value chain, including workers under informal and cooperative settings and recognising their fundamental human dignity and historic contribution.
- It involves **maximising the social and economic opportunities** of ending plastic pollution while minimising and carefully managing any challenges.
- A plan for a just transition will **guarantee better and decent work, social protection, training opportunities and greater job security** for workers at all stages of the plastic value chain.

Intergovernmental Negotiating Committee (INC) to phase out plastic-

- In February 2022, at the resumed **fifth session of the United Nations Environment Assembly (UNEA-5.2)**, a historic **resolution (5/14)** was adopted to develop a **legally binding instrument on plastic pollution** with the ambition to complete the negotiations by end of **2024**.
- The **Intergovernmental Negotiating Committee (INC)** was established to develop an international **legally binding instrument on plastic pollution**, including in the marine environment.
- The first meeting of the Intergovernmental Negotiating Committee (INC-1) took place in a hybrid format from 28 November to 2 December, in **Punta del Este, Uruguay**.

Demand being put at the meeting-

- **Petrochemical companies** should immediately **phase toxic chemicals** out of plastics production and recycling, eliminate non-recyclable plastics and ensure that all materials have value.
- Rejection of false solutions like **incineration** and **pyrolysis**.

13. Health to harm: Researchers call for action against pharma pollution

Context-

- The academics from the **University of Exeter, United Kingdom**, have joined forces with thought leaders from other universities, industry, government and non-profit organisations to call for societal-wide action on reducing **pharmaceutical pollution** from human healthcare.

Extent of pharmaceutical pollution-

- Almost half, or **43 per cent**, of the **world's rivers** are contaminated with **active pharmaceutical ingredients (APIs)** in concentrations that can have disastrous ramifications on health.
- In 2019, AMR accounted for more than half a million deaths in the European region and about five million globally.

Major cause of this pollution-

- Throwing away unused drugs/medicines rather than returning them to the pharmacies.
- As a consequence, **drug pollution levels** are rising in waterways across the UK and globally.

Pharmaceuticals led water pollution in India-

- India is one of the biggest manufacturers of pharmaceuticals worldwide.
- Varieties of pharmaceuticals have been detected on the **surface, ground**, and even in **drinking water** in many Indian cities due to the **discharge of waste effluents**.
- The pollutants majorly enter water bodies due to the following sources: pharmaceutical manufacturing plants, hospitals, wastewater treatment plants, etc.
- As a consequence, they cause adverse effects on land, water, food, and people's health.
- It has been estimated that about **60000 newborns die annually in India** because of multidrug-resistance infections, where pharmaceutical water pollution with antimicrobial drugs is responsible for that.
- A range of emerging contaminants pollutes the rivers near the pharma sites.

- **Musi River in Hyderabad** is highly contaminated with drugs from pharmaceutical companies.
- The concentrations were about **1000 times higher than rivers found in developed countries**.
- When these pharmaceutical clusters come in contact with pathogenic bacteria, it causes harmful diseases in humans.

14. Okavango, Murchison Falls: Flags report

Murchison Falls: Big Oil closing in on two iconic African Edens, flags report

Context- Oil companies are threatening **two of Africa's most iconic biodiversity hotspots (Okavango delta and Murchison falls)** in an effort to drill for oil that will ultimately make its way to a global elite and won't benefit Africans, a recent report by a German non-profit has highlighted.

Okavango delta-

- The **Okavango delta** is formed by the **Okavango river**, which originates in the highlands of **Angola**.
- It flows into the **Kalahari Desert** of southern Africa and spreads out, forming what is called a '**fan**'.
- The **Okavango's waters** make the otherwise dry area a waterlogged wetland that provides vital water resources for animals, plants and over one million people.
- The delta is also the **homeland of indigenous people** like the **San**.
- The **delta** is home to **Africa's Big Five wildlife species**: Savanna elephants, Cape buffaloes, rhinos, lions and leopards.
- There are also giraffes, zebras, antelopes, pangolins, 400 bird species and over 1,000 plant species.

Murchison Falls-

- It is situated on the **northern shore of Lake Albert**, one of the **Rift Valley Great Lakes** that lies on the border between **Uganda** and the **Democratic Republic of the Congo**.
- The **Victoria Nile** flows through the park and elephants, hippos, Nile crocodiles, buffaloes and marabou storks can regularly be seen on its banks.
- This natural refuge harbours **556 bird species** and **188 mammal species**.

Oil drilling led environmental damage-

- In **48** out of **55 African nations**, oil, gas and coal companies are either exploring or developing new fossil reserves, building new fossil infrastructures such as pipelines or liquefied natural gas (LNG) terminals or developing new gas and coal-fired power plants.
- **In the Okavango delta region-**
 - **Recon Africa**, a Canadian company, has been drilling for oil in the **Kavango Zambezi Trans frontier Nature Conservation Area (KAZA)**.
 - An oil spill could pollute the **Okavango River** and ultimately also the **Okavango delta**.
 - **KAZA** is the **second-largest nature and landscape conservation area** in the world.
 - It is spread across the borders of **Angola, Botswana, Namibia, Zambia and Zimbabwe**.
- **In the Murchison fall region-**
 - **French** oil giant **Total Energies** and **China's National Offshore Oil Company (CNOOC)** plan to exploit one billion barrels of crude oil from the **Tilenga oil field** at the **northern tip of Lake Albert** and the **Kingfisher oil field** at the **southern end of the lake**.
 - The **1,443 km long pipeline** will transport the crude through **Uganda** and **Tanzania** to the **Indian Ocean Port of Tanga**.
- The whole project would cut through the habitats of several wild species.
- Once the pipeline reaches the **Tanzanian coast**, oil tankers would steer through **mangrove swamps** and **coral reefs** to export the oil.
- The pipeline will also run through **178 villages in Uganda** and **231 villages in Tanzania**. All in all, **Total Energies' and CNOOC's project** will force **more than 100,000 people off their lands**.

15. Three Himalayan medicinal plants enter IUCN list

- Three medicinal plant species found in the Himalayas have made it to IUCN Red List of Threatened Species following a recent assessment.
- The details of the medicinal plants are given below:

Meizotropis pellita:

- **Meizotropis pellita**, commonly known as **Patwa**, is a perennial shrub with restricted distribution that **is endemic to Uttarakhand**.
- "The species is listed as '**critically endangered**' based on its limited area of occupancy (less than 10 sq. km)," the study stated.
- The species is threatened by deforestation, habitat fragmentation and forest fires.
- The essential oil extracted from the leaves possesses strong antioxidants and can be a promising natural substitute

for synthetic antioxidants in pharmaceutical industries.

Fritillaria cirrhosa:

- Fritillaria cirrhosa (**Himalayan fritillary**) is a perennial bulbous herb.
- According to the study, a decline of at least 30% of its population over the assessment period (22 to 26 years).
- Considering the rate of decline, long generation length, poor germination potential, high trade value, extensive harvesting pressure and illegal trade, the **species is listed as 'vulnerable'**.
- In China, the species is used for the treatment of bronchial disorders and pneumonia.
- The plant is also a strong cough suppressant.

Dactylorhiza hatagirea:

- The species is commonly known as **Salampanja** and is a **species of orchid generally found in the Himalayas**.
- **The species listed as Endangered in the IUCN list.**
- It is threatened by habitat loss, livestock grazing, deforestation, and climate change.
- It is extensively used in Ayurveda, Siddha, Unani and other alternative systems of medicine to cure dysentery, gastritis, chronic fever, cough and stomach aches.

IUCN Redlist of threatened species

- **Established in 1964**, the International Union for Conservation of Nature's Red List of Threatened Species has evolved to become the world's most comprehensive information source on the global extinction risk status of animal, fungus and plant species.
- The IUCN Red List is a **critical indicator of the health of the world's biodiversity**.
- The IUCN Red List is used by government agencies, wildlife departments, conservation-related non-governmental organizations (NGOs), according to the list, biodiversity is declining.
- Currently, there are more than 138,300 species on The IUCN Red List, with more than 38,500 species threatened with extinction, including 41% of amphibians, 37% of sharks and rays, 34% of conifers, 33% of reef building corals, 26% of mammals and 14% of birds.

16. COP15 Montreal: Abalone, dugong, pillar coral threatened with extinction

Context- A list of threatened species released at the **15th Conference of Parties (COP15)** to the **United Nations Convention on Biological Diversity (CBD)** in **Montreal, Canada** has been released.

Global figures for the 2022-2 IUCN Red List of Threatened Species:

- TOTAL SPECIES ASSESSED = 150,388
- (Total threatened species = 42,108)
- Extinct = 902
- Extinct in the Wild = 84
- Critically Endangered = 9,251
- Endangered = 16,364
- Vulnerable = 16,493
- Near Threatened = 8,816
- Lower Risk/conservation dependent = 152 (this is an old category that is gradually being phased out of The IUCN Red List)
- Least Concern = 77,491
- Data Deficient = 20,835

Major species included in the list are-

- Abalone shellfish species
- Dugongs
- Pillar corals

Abalone shellfish-

- Abalone is a common name for any of a group of small to very large marine gastropod molluscs in the family Haliotidae.
- Other common names are **ear shells**, **sea ears**, and, rarely, **muttonfish** or **muttonshells** in parts of **Australia**, **ormer** in the **UK**, **perlemoen** in **South Africa**, and **paua** in **New Zealand**. Abalones are **marine snails**.
- The flesh of abalones is widely considered to be a desirable **food** and is consumed raw or cooked by a variety of cultures.

Threat to abalone species-

- As many as **44 per cent of all abalone shellfish species** are now threatened with extinction.
- **Abalone species** are among the world's most expensive **seafood** and are considered a **culinary delicacy**.
- Unsustainable extraction and poaching along with climate change, disease and pollution have put **twenty of the world's 54 abalone species at risk of extinction**.

Some important abalone species facing threats of extinction are-

- **Roe's abalones** in Western Australia (99% were killed during the 2011 marine heatwave off the Australian coast).
- **Critically Endangered** black abalone in California and Mexico
- **Vulnerable green ormer**, ranging from the **English Channel** to **northwest Africa**

Major threats to abalones are-

- Marine heatwaves
- Pollution from agricultural and industrial run-off
- Toxins such as antifouling boat paint
- Overfishing
- Habitat loss
- Warming and acidification

Dugongs-

- **Dugong (Dugong dugon)** also called 'Sea Cow' is **one of the four surviving species** in the **Order Sirenia** and it is the only existing species of **herbivorous mammal** that lives exclusively in the sea including in **India**.
 - **Dugongs** are an important part of the marine ecosystem and their depletion will have effects all the way up the food chain.
- **Distribution and Habitat:** They are found in over **30 countries** and in **India** are seen in the **Gulf of Manner, Gulf of Kutch, Palk Bay**, and the **Andaman and Nicobar Islands**.
- **IUCN Red List status:** Vulnerable
 - Dugong populations in **east Africa** and **New Caledonia** have entered the **IUCN Red List as Critically Endangered** and **Endangered** respectively; the species remains **Vulnerable** globally.
- **Wild (Life) Protection Act, 1972:** Schedule I
- **CITES:** Appendix I

Threats to Dugong include-

- Unintentional capture in fishing gear
- Destruction of their food (seagrass) due to chemical pollution,
- Oil and gas exploration and production,
- Bottom trawling
- Unauthorised coastal development.

Pillar corals-

- Pillar coral is a **hard coral** (order Scleractinia) found in the **western Atlantic Ocean** and the **Caribbean Sea**.
- It is the **only species** in the monotypic genus Dendrogyra.
- It is a **digitate coral** -that is, it resembles fingers (Latin digites) or a cluster of cigars, growing up from the sea floor without any secondary branching.
- It is large and can grow on both flat and sloping surfaces at depths down to 20 m (65 ft).
- It is one of the few types of hard coral in which the polyps can commonly be seen feeding during the day.
- Found throughout the **Caribbean** from the **Yucatan Peninsula** and **Florida** to **Trinidad and Tobago**, have moved from **Vulnerable to Critically Endangered** on the IUCN Red List.
- Its population **shrunk by over 80 per cent** across most of its range since 1990.
- **Threat-** They are affected by the **contagious Stony Coral Tissue Loss Disease** and can affect anywhere between 90 and 100 metres of reef per day.

17. Special Relationship: New Anglo-American energy partnership

New Anglo-American energy partnership is Western fossil fuel hypocrisy at its best

Context- The United States and the United Kingdom announced an "energy security and affordability partnership" on December 7, 2022.

The energy security and affordability partnership-

- The deal was signed between **the USA and the UK**.
- The **UK and US** will drive work to-
 - **Reduce global dependence on Russian energy exports,**
 - **Stabilise energy markets**
 - **Step up collaboration on energy efficiency, nuclear and renewables.**
- The initiative will be **steered by a new UK-US Joint Action Group**.

What is the issue in this deal-

- The **amount of liquified natural gas (LNG)** being supplied by the **US to the UK** will now be more than doubled. **LNG** is a major source of **methane emission** and **carbon emissions**.

- On the one hand, **German** and **US** negotiators are convincing countries like India to come on board and sign **JETP** deals to **phase out coal**. On the other, they are signing deals promising huge exports of LNG to the UK.
 - JETP** or **Just Energy Transition Partnership** is a deal proposed by G7 countries, and signed by **South Africa, Indonesia** and **Vietnam** to transition these coal-based economies to renewables.

18. Uttarakhand plans genetic enhancement of its indigenous Badri cow

Context- To increase the productivity of its **indigenous petite Badri cow**, which grazes on the medicinal herbs of the Himalayas, Uttarakhand is now planning for its genetic enhancement.

About the Badri cow-

- The **Badri breed** derived its name from the holy shrine of Char Dham at **Badrinath**.
- Possessing a balanced gait for the hills, this cattle breed is **small in size** with **long legs** and **varied body colours** – black, brown, red, white or grey.
- This breed is **comparatively more resistant to diseases**, mostly due to its eating habits.
- It eats **medicinal herbs**, and is far away from **toxic pollution, polythene** and other harmful things that cows in the plains are subject to.
- Its milk has rich medicinal content and high organic value.
- Badri cow products** are being sold online by **Hetha Organics** and **Badri Ghee** is sold by the **Uttarakhand Cooperative Dairy Federation** under their brand name ‘**Anchal**’.

Need for genetic enhancement-

- Badri cow** is the **first registered cattle breed of Uttarakhand** which has been certified by the **National Bureau of Animal Genetic Resources (NBAGR)**.
- Its **milk production capacity is quite less** as it gives one to three litres of milk per day.
- To make the farmers of Uttarakhand breed Badri and not shift to other high milk-producing alternative breeds like Jersey cows, genetic enhancement is necessary.
- Multiple Ovulation Embryo Transfer (MOET)**, a conventional embryo flush, which is the most common procedure used in advanced cattle breeding will be used for this purpose.

The technology to be used is-

- Sex-sorted semen technology to improve production.
- Multiple Ovulation Embryo Transfer (MOET)** to produce more cattle of high genetic stock.

19. Forest department initiative to restore natural vegetation

Context- The Forest department in association with **Noolpuzha grama panchayat (Kerala)** has launched the ‘**Vanikaran**’ (afforestation) project to root out invasive plants, especially **Senna spectabilis**, and restore natural forests.

Details-

- The project was being executed on **30 hectares of forestland under the Sulthan Bathery forest range of the Wayanad Wildlife Sanctuary**, where exotic invasive plants, including **Senna spectabilis, Eupatorium, Mikania micrantha**, and **Lantana Camara**, were posing a serious threat to the local species of trees.

Wayanad Wildlife Sanctuary-

- Established in **1973**, the sanctuary is now an integral part of the **Nilgiri Biosphere Reserve**.
- It is bounded by the protected area network of **Nagarhole National Park** and **Bandipur National Park** in **Karnataka** in the northeast, and on the southeast by **Mudumalai National Park** in **Tamil Nadu**.
- It is part of the **Deccan Plateau** and the vegetation is predominantly of the **south Indian moist deciduous teak forests**.
- Also, the sanctuary has pastures of **west-coast semi-evergreen trees**.
- The wildlife sanctuary comes under **Protect Elephant**.
- Scheduled tribes** here include **Paniyas, Kurubas, Adiyans, Kurichiyas, Ooralis** and **Kattunaikkans**.

Senna spectabilis

- Senna spectabilis** is a plant species of the **legume family (Fabaceae)** native to **South and Central America**.
- They are often grown as **ornamental** plants due to their **bright yellow flowers** that bloom during the summer months.
- They are also known as **golden wonder tree, American cassia, popcorn tree, Cassia excelsa, golden shower tree** or **Archibald's cassia**.
- The plant has become an **invasive alien species** in parts of **Africa** such as **Kenya, Malawi, Tanzania and Uganda**, and also in **South India** after it was introduced for resources such as **firewood** as well as to help combat deteriorating ecosystems affected by deforestation and desertification.

- Currently, **S. spectabilis** is overtaking native tree species of forestry ecosystems worldwide because of its ability to grow quickly.

Uses of **S. spectabilis**-

- It has medicinal properties and is used as a treatment for ringworm and skin diseases.
- The plant is effective against food-borne pathogen B.
- It is also used as a medicinal plant in **Cameroon** by **traditional healers** to treat **epilepsy, constipation, insomnia, and anxiety**.

Lantana Camara-

- It is a species of **flowering plant native to the American tropics**.
- It is a very adaptable species and has spread from its native range to around **50 countries**, where it has become an **invasive species**.

20. Those fascinating hornbills

Context-

- The **logo for India's upcoming G20 presidency** was officially unveiled recently at the **Hornbill festival in Nagaland**.

About the Hornbill festival-

- It is celebrated in **Nagaland** to encourage **inter-tribal interaction**.
- It is one of the largest **indigenous festivals** organised by the **state government of Nagaland** to promote tourism in the state.
- The festival is **celebrated annually in the first week of December** in order to preserve, protect and revive the uniqueness and richness of the Naga heritage.
- The festival is considered the **"Festival of Festivals"** in Nagaland.
- The festival is named after the bird – **Hornbill** which is the most revered and admired bird for the Nagas.
- The festival is a tribute to this bird, known for its qualities of grandeur and alertness.

About the great hornbill-

- Found in the **Himalayan foothills, the Northeast and the Western Ghats**.
- It is the **state bird** of Arunachal Pradesh and Kerala.
- The **wreathed hornbill, the brown hornbill** and the **rufous-necked hornbill** are slightly smaller and **only found in Northeast India**.
- Malabar grey hornbill** is found in western ghats.
- The **Indian grey hornbill** is found **all over** (except the Thar Desert).
- Hornbills prefer **tall trees** for their nests (breast height being 1.5 metres or more). The **Tualang trees** of **Southeast Asia** are a preferred habitat for hornbills.
- They play a vital role in **dispersing the seeds of about 80 rainforest trees**.
- Some trees, such as the cup-calyx white cedar suffer a 90% decline in seed dispersal.

Threats faced are-

- Deforestation and the felling of tall trees
- Hunting and poaching
- The **helmeted hornbill of Sumatra and Borneo** is **critically endangered** because its **helmet-like casque** called **red ivory**, is highly prized.

Conservation status-

- IUCN Red list**- Vulnerable
- All species except the Oriental pied hornbill** are listed under **Schedule I** of the **Wildlife Protection Act (1972)**.
- CITES**- Appendix I

21. Burdened beast: India's donkeys are disappearing; here is why

Rapid disappearance of donkey population-

- According to the **"20th Livestock Census"** released in **2019**, India has **0.12 million donkeys** — **62 per cent** lower than the 0.32 million recorded in 2012.
- Other **equines** — **mules, horses and ponies** — also saw a **decrease** in numbers, while the populations of **cattle, buffaloes, sheep** and **goats rose in 2012-19**.
- The **rate of decline** in the donkey population is also increasing exponentially.

Reasons for their decline-

- One of the main reasons for the decline in donkey population may be the **significant demand for its meat and hide**.
- Although **trade of donkey's meat is illegal**, there is rampant smuggling both inside the country and abroad.

- Donkey meat is consumed in **southern states**, particularly **Andhra Pradesh** and parts of **Telangana**.
- In **traditional Chinese medicine**, boiling donkey skin produces a **gelatin called ejiao**, which can be consumed or mixed with **cosmetic products to treat** conditions such as **insomnia, dry cough** and **poor blood circulation**.
- A study by the non-profit in **2021** records **illegal export of live donkeys, hide and meat** from states like **Maharashtra, Andhra Pradesh, Uttar Pradesh and Gujarat**.
- **Other reasons include:**
 - Mechanisation in industries
 - Communities moving to other occupations due to better education,
 - Lack of government support or policy
 - Increase in the cost of maintaining the animal.

Importance-

- **Donkey milk** is **nutritious** and has **less fat content** compared to bovine milk. But there is not much awareness and market for it.
- **Maldhari community** of **Gujarat** that rears **Halari donkeys** (a breed native to the state), also consume their milk to treat health ailments.
- **ICAR-NRCE** is studying the properties of the milk and working on improving the yield.

Donkey breeds found in India are primarily used to carry heavy loads		
Breed	Native region; characteristics	Use
Kachchhi	Kutch region of Gujarat; grey, white, brown or black in colour	For weed removal in farms and as pack animal during pastoralist migration. It can carry 80-100 kg and pull 200-300 kg on carts.
Halari	Saurashtra region of Gujarat; white in colour, docile temperament	As pack animal during pastoralist migration and to pull carts. It can walk around 30-40 km in a day
Sindhi	Barmer and Jaisalmer districts of Rajasthan; brown in colour	As pack animal to transport water, soil, earthenware, construction material, fodder and to pull carts and for ploughing by small and marginal farmers. They can carry 1,000-1,500 kg.
Spiti	Cold desert areas of Himachal Pradesh; dark brown, brown or black in colour	For immediate transport of highly perishable cash crops and fruits, food grains and other items to far flung areas; to fetch wood, logs and other minor forest produce; and to bring dung or manure from pastures to villages or fields.

22. GIS based portals for environment scrutiny

Concept:

PARIVESH portal (Pro-Active and Responsive facilitation by Interactive Virtuous and Environmental Single-window Hub):

- It is a single-window integrated environmental management system for online submission and monitoring of the proposals submitted by the proponents for seeking Environment, Forest, Wildlife and Coastal Regulation Zone clearances from Central Government.
- It is a GIS based system and analytics platform that provides information to various stakeholders using Decision Support System functionality
- It automates the entire process starting from submission of application, preparation of agenda, preparation of Minutes as well as grant of clearances.

e-Green Watch portal:

- Environment Ministry is an advanced technology-based platform designed to facilitate automation, streamlining and effective management of processes related to plantations and other forestry works taken up under CAMPA fund.
- Forest Survey of India (FSI) carries out analysis of geo-spatial data (polygons) of various plantations uploaded by the State Forest Departments on e-Green Watch portal for accuracy of location, area and year of plantation.

Van Agni Geo-portal:

- Forest Survey of India has also developed Van Agni Geo-portal to provide user-friendly interactive viewing of the forest fire related data for continuous monitoring and tracking of large forest fires in near real-time basis.
- Van Agni Geo-portal serves as a single point source for the information related to forest fires in India.

23. Bill to set up carbon credit trading passed

Context:

- The Rajya Sabha passed the **Energy Conservation (Amendment) Bill, 2022**. The Lok Sabha had passed the amendment in August, 2022.

What is Energy Conservation (Amendment) Bill, 2022:

- The Bill seeks to **amend the 2001 Act** to
 - Facilitate the **achievement of COP-26 goals**.
 - **Introduce concepts** such as **mandated use of non-fossil sources** and **carbon credit trading** to ensure faster decarbonisation of the Indian economy.

What are the key features of the bill:

- **Carbon credit trading:** The Bill empowers the central government to specify a carbon credit trading scheme. Carbon credit implies a tradable permit to produce a specified amount of carbon dioxide or other greenhouse emissions.
- **Obligation to use non-fossil sources of energy:** The Act empowers the central government to specify energy consumption standards for designated consumers to meet a minimum share of energy consumption from non-fossil sources.
 - Designated consumers include:
 1. industries such as mining, steel, cement, textile, chemicals, and petrochemicals,
 2. transport sector including Railways,
 3. commercial buildings, as specified in the schedule.
- **Energy conservation code for buildings:** The bill empowers the central government to specify norms for energy efficiency and conservation, use of renewable energy, and other requirements for green buildings.
 - Under the Act, the energy conservation code applies to commercial buildings:
 1. Erected after the notification of the Code,
 2. Having a minimum connected load of 100 kilowatt (kW) or contract load of 120 kilo volt ampere (kVA).
- **Standards for vehicles and vessels:** Under the bill, the energy consumption standards may be specified for equipment and appliances which consume, generate, transmit, or supply energy. The Bill expands the scope to include vehicles as defined under the Motor Vehicles Act, 1988, and vessels like ships and boats.
- **Composition of the governing council of BEE:** The Act provides for the setting up of the Bureau of Energy Efficiency (BEE). The Bill proposes to increase the number of members of the BEE from 20-26 to 31-37.

24. Equitable benefit sharing of digitised genetic information:

Equitable benefit sharing of digitised genetic information to span across discussions at COP15

Context:

At CoP15 to CBD-

- Issues of access and benefit-sharing from digital sequence information on genetic sources (DSI) will be a critical point of negotiations at the UN Biodiversity Conference or COP15 in Montreal, Canada.

The current issue with DSI on genetic resources-

- Lack of clarity on the definition of DSI, challenges in the traceability of the country of origin of DSI through digital databases, apprehensions around losing open access to DSI data, and divergent views on multilateral or bilateral policy options on benefit-sharing from DSI compound the negotiations.
- Little progress was made on DSI at the pre-COP15 Open-Ended Working Group (OEWG-5) meetings, to advance a refined, less bracketed draft text of the GBF, that will set the stage for the final COP15 negotiations.

Digital Sequence Information (DSI) on Genetic Resources-

- **Digital sequence information (DSI)** is a term used in the context of certain international policy fora, particularly the **Convention on Biological Diversity**, to refer to data derived from genetic resources.

- **DSI** refers to **data from DNA or RNA** that can be stored digitally.
- The term is generally agreed to include **nucleic acid sequence data** and may be construed to include other data types derived from or linked to **genetic resources**, including, for example, **protein sequence data**.
- The exact scope of this term is an aspect of ongoing policy discussions.
- **DSI** is crucial to research in a wide range of contexts, including **public health, medicine, biodiversity, plant and animal breeding, and evolution research**.
- The **Nagoya Protocol**, a component of the **Convention on Biological Diversity**, establishes a **right for countries to regulate, and to share in benefits** derived from, their nation's genetic resources by arranging **Access and Benefit Sharing Agreements** with users.

Challenges:

- Academic researchers, however, generally **share DSI freely and openly online**, following a set of principles that align with the open science movement.
- **Open sharing** of **DSI** is recognized to have broad benefits, and open science is a major and growing focus of international science policy.
- This creates a perceived conflict with **benefit-sharing obligations**, as individuals can access and use these open data without entering into benefit-sharing agreements.
- Parties to the **Convention on Biological Diversity** are currently considering a range of policy options that strike different balances between these two important international policy goals.

25. Can Montreal help communities:

Here's a look at access and benefit-sharing around the world

Context-

- **Access and benefit sharing** are one of the **three objectives** of the **United Nations Convention for Biological Diversity (CBD)**.
- But on the ground, there is **very little evidence** that **benefits arising from the use of biodiversity have been shared equitably** with the communities that have protected it for centuries.

What are ABS?

- **Access and benefit sharing (ABS)** refer to the way in which genetic resources may be accessed, and how users and providers reach an agreement on the fair and equitable sharing of the benefits that might result from their use.
- **Article 15** of the **Convention on Biological Diversity (CBD)** sets out rules, which govern access and benefit sharing. Under these rules, the governments of countries have **two key responsibilities**:
 - To put in place systems that facilitate access to genetic resources for environmentally sound purposes
 - To ensure that the benefits resulting from their use are shared fairly and equitably between users and providers

Key agreements:

- **Prior informed consent (PIC)**: Permission given from the CNAs (Competent National Authority) of a provider country to a user prior to accessing genetic resources, in line with an appropriate legal and institutional framework.
- **Mutually agreed terms (MAT)**: An agreement reached between the providers of genetic resources and users on the conditions of access and use of the resources, and the benefits to be shared between both parties.

Status of ABS globally-

- **CBD** leaves many matters to the interpretation of each country's laws.
- Some allow for the communities to receive benefits directly, while others consider that the state should manage them.
- **Axolotl of Mexico-**
 - **Mexico**, a founding member of **CBD**, has issued **only eight internationally recognised certificates of compliance (IRCC)**.
 - **Biopiracy** has led to mistrust among the community in terms of sharing knowledge and hence, there is a lack of progress in developing agreements.
 - An **example of biopiracy** is that of the **axolotl**, a **Mexican salamander** that can **regrow its limbs** and organs and thus may hold clues for human tissue regeneration.
 - Biodiverse countries like **Colombia, Costa Rica** and **Paraguay** are not parties to the **Nagoya Protocol**, while in others like Brazil, national politics undermine environmental policies.
- **kurinji honey- India**
 - It is collected from the **Shola forest region** in the **Western Ghats of Tamil Nadu**.
 - This honey is considered **rare** as it is collected from **bees** that feed on **Strobilanthes kunthiana**, a shrub with a **purplish-blue flower** that **blooms once in 12 years**.
 - **Peliyan tribal community**, which collects the honey have received the benefit of this yet.

- Political issues have hampered **benefit sharing** from the **use of genetic resources** in **Cameroon, Africa**, which is seeing civil unrest.
- **Mondia whitei**, a tree climber found in **Cameroon** and **Kenya**.
 - The plant is used as a food flavouring agent and its roots to treat multiple diseases.

26. Double financing for natural ecosystems by 2025: UN report

Double financing for natural ecosystems by 2025 to deal with climate, biodiversity crises

Context-

- Financing for **nature-based solutions (NbS)** needs to be **doubled** to deal with multiple global crises of climate change, biodiversity loss and land degradation, according to a new United Nations (UN) report.

What is Nature-based Solutions (NbS)-

- Nature-based solutions are actions to **protect, sustainably manage, or restore natural ecosystems**, that address societal challenges such as climate change, human health, food and water security, and disaster risk reduction effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.
 - e.g. **Planting trees** that thrive in coastal areas – known as **mangroves** -- **reduces the impact of storms on human lives and economic assets**, and provides a **habitat for fish, birds** and other plants supporting biodiversity.

Salient features of NbS-

- Embrace **nature conservation norms** and principles;
- can be **implemented alone or in an integrated manner** with other solutions to societal challenges (e.g. technological and engineering solutions);
- are determined by **site-specific natural and cultural contexts** that include traditional, local and scientific knowledge;
- produce **societal benefits in a fair and equitable way**, in a manner that promotes transparency and broad participation;
- maintain biological and cultural diversity and the ability of ecosystems to evolve over time;
- are applied at a landscape scale;
- recognise and address the trade-offs between the production of a few immediate economic benefits for development, and future options for the production of the full range of ecosystems services; and is an integral part of the overall design of policies, and measures or actions, to address a specific challenge?

NbS Approaches	Example
Ecosystem restoration	<ul style="list-style-type: none"> • Ecological restoration • Ecological Engineering • Forest landscape restoration
Issue-specific	<ul style="list-style-type: none"> • Ecosystem-based adaptation • Ecosystem-based mitigation • Climate adaptation services • Ecosystem-based disaster risk reduction
Infrastructure	<ul style="list-style-type: none"> • Natural infrastructure • Green infrastructure
Management	<ul style="list-style-type: none"> • Integrated coastal zone management • Integrated water resources management
Protection	<ul style="list-style-type: none"> • Area-based conservation approaches, including protected area management

Do nature-based solutions help fight climate change?

- World Bank estimates suggest that nature-based solutions can provide **37%** of the mitigation needed until **2030** to achieve the targets of the **Paris Agreement**.
- **Examples include-**
 - **Restoring native forests** at the margins of the river to **avoid landslides** can also act as a carbon sink.
 - **Climate-smart agriculture** enables farmers to retain more carbon in their fields as they produce crops.
 - **USD 57 billion in flooding damages** averted by mangroves in China, India, Mexico, US and Vietnam each year.

Types of NbS:

- **Minimal Intervention in Ecosystems:**

- It consists of **no or minimal intervention** in ecosystems,
- Examples include the protection of mangroves in coastal areas to limit risks associated with extreme weather conditions and provide benefits and opportunities to local populations.
- **Some Interventions in Ecosystems and Landscapes:**
 - It corresponds to management approaches that develop **sustainable and multifunctional ecosystems and landscapes** (extensively or intensively managed).
 - This type of NBS is strongly connected to concepts like natural systems agriculture, agro-ecology, and evolutionary-orientated forestry.
- **Managing Ecosystems in Extensive Ways:**
 - It consists of **managing ecosystems in very extensive ways** or even creating new ecosystems (e.g., artificial ecosystems with new assemblages of organisms for green roofs and walls to mitigate city warming and clean polluted air).
 - It is linked to concepts like green and blue infrastructures and objectives like restoration of heavily degraded or polluted areas and greening cities.

Recognition:

- **United Nations:**
 - The UN promoted NBS as the **theme for World Water Day 2018** as "**Nature for Water**".
 - The **UN World Water Development Report** was titled "**Nature-based Solutions for Water**".
 - The **2019 UN Climate Action Summit** highlighted **Nature-based solutions** as an effective method to combat climate change.
 - A **Nature Based Solution Coalition** was created, including dozens of countries, led by **China** and **New Zealand**.
- **European Union:**
 - Since 2016, the EU has supported a multi-stakeholder dialogue platform (Think Nature) to promote the co-design, testing, and deployment of improved and innovative NBS in an integrated way.
- **India:**
 - India launched its **first National Coalition platform for Urban nature-based solutions (NbS)** under the **Cities4Forests** initiative.
 - **Cities4Forests:** It works closely with cities around the world to connect with forests, emphasises the importance of wetlands and their multiple benefits to help combat climate change and protect biodiversity in cities.

27. As earth heats up, arctic faces disproportionate impact: NOAA

Context:

- The once reliably frigid and frozen Arctic is becoming wetter and stormier, with shifts in its climate and seasons that are forcing local communities, wildlife and ecosystems to adapt.
- **2022** was only the **Arctic's sixth warmest year on record**, researchers saw plenty of new signs this year of how the region is changing.

Signs of changing climate in the arctic region:

- September heat wave in Greenland led to excessive ice melting.
- The August 2021 heatwave caused it to rain for the first time.
- Temperatures in the Arctic Circle have been rising much more quickly than those in the rest of the planet.
- Warming in the arctic raises the sea level worldwide.

Three main factors could be increasing precipitation in different parts of the Arctic:

1. Warmer air can hold more moisture.
2. As sea ice retreats, storms can suck up more open ocean water.
3. Storms are passing over warmer water before reaching the Arctic, feeding them with more energy.

NOAA: Arctic report card:

- **National Oceanic and Atmospheric Administration (NOAA)** produces this report annually since 2006.
- This year's report is produced in **Chicago**.
- **As per the report:** Rising temperatures have helped plants, shrubs and grasses grow in parts of the Arctic tundra, and 2022 saw levels of green vegetation that were the fourth highest since 2000, particularly in the **Canadian Arctic Archipelago, northern Quebec and central Siberia**.

Arctic amplification:

- The Arctic's extreme warming, known as **Arctic amplification or polar amplification**, may be due to three factors.
- One, the **region's reflectivity, or albedo** is changing as the world warms.
- If the sea ice melts in the Arctic that will remove that white surface off of the ocean, and what will be exposed is this **darker ocean surface that will absorb more of the sun's heat**.

- This dovetails with the second factor: **changing currents**.
- Ocean currents normally bring in warmer water from the Pacific, and colder water exits out of the Arctic into the Atlantic.
- But those **currents may be changing because more melting ice is injecting the Arctic Ocean with freshwater**, which is less dense than saltwater, and therefore floats above it.
- The missing ice also exposes the surface waters to more wind, **speeding up the Beaufort Gyre in the Arctic**, which traps the water it would normally expel into the Atlantic.
- This acceleration **mixes up colder freshwater at the surface and warmer saltwater below**, raising surface temperatures and **further melting ice**.
- Ocean **currents influence the weather**, a third factor.
- They drive the powerful polar jet stream, which moves hot and cold air masses around the Northern Hemisphere. This is **a product of the temperature differences between the Arctic and the tropics**.
- But as the Arctic warms, the **jet stream now undulates wildly north and south**. This has been **injecting the Arctic with warm air in the summer** and the US with extremely cold air in the winter, like during the “polar vortex” of January 2019.

28. Wayanad rice festival promotes climate-resilient crops

Context: A Kerala-based organisation named **Thanal** has embarked on a unique conservation experiment, **planting 300 climate-resilient varieties of traditional rice** on **1.5 acres of land** at its **agroecology centre** in **Panavally** in the **Wayanad district**.

About the initiative:

- **Ikki Jathre**, or the **Festival of Rice**, launched by the **Kerala-based organisation Thanal**.
- During the festival, **Thanal** initiates **planting 300 climate-resilient varieties of traditional rice** to promote the traditional agriculture system.
- **Thanal** has been organising annual “**rice field weeks**” since **2012**.
 - Most of the varieties were collected from Kerala, Karnataka, Assam, Tamil Nadu, Arunachal Pradesh, Maharashtra and West Bengal. There are three traditional rice varieties from Vietnam and Thailand.
 - Throngs of farmers, researchers, environmentalists and students have been arriving at Panavally to take part in the festival.
- **Aim of the initiative:** To sensitise people to the significance of conserving traditional crops that have the ability to withstand harsh climatic conditions.
 - The festival also sets the **stage for knowledge sharing and co-creation of knowledge between tribal farmers and experts**.

Agro Ecology Centre, Wayanad:

- Agro Ecology Centre is an off campus of **Thanal** at Panavally in the district of Wayanad.
- The centre facilitates research and documentation on **agro bio diversity, organic farming** and other activities related to **Agriculture and Food Safety**.
- The centre hosts around **200 traditional varieties of rice**.
- The centre provide **training for farmers, students and Government officials**.
- The Centre also **facilitate seed production, conservation and exchange**.

Importance of traditional rice cultivation:

- **India** had **nearly 1.5 lakh varieties of rice**, with about **3,000 varieties unique to Kerala**.
- Many of these have disappeared. Only **6,000 varieties** are currently being cultivated by the farmers in the country.
- The **Thondy variety**, a **traditional and popular rice** among the people in **Wayanad** a few decades ago, could compete with any hybrid rice in terms of productivity.
- Moreover, the **input cost of traditional rice cultivation is very low** owing to its inherent resistance to pests and diseases.
- Also, its nutritional value is high.
- Many farmers had stopped cultivating traditional rice seeds after hybrid rice varieties became popular, under the misconception that the former has low productivity.

29. Funding the energy transition:

India's G20 presidency must follow lessons from COP27

The V20 group:

- The **Vulnerable Twenty (V20) Group** was established with the **inaugural meeting** of the **V20 Ministers of Finance** of the **Climate Vulnerable Forum** chaired by the **Philippines**, on **08 October 2015** in **Lima, Peru** in conjunction with the **2015 Annual Meetings** of the **World Bank Group and International Monetary Fund**.

- It is a dedicated cooperation initiative of **economies systemically vulnerable to climate change**.
- Currently, **Marshall islands** hold the presidency since **2018**.
- **Background:**
 - The call to create the **V20 (group of 58 countries)** originated from the **Climate Vulnerable Forum's Costa Rica Action Plan (2013-2015)** in a major effort to strengthen economic and financial responses to climate change.
 - It **foresaw a high-level policy dialogue** pertaining to **action on climate change** and the **promotion of climate resilient and low-emission development** with full competence for addressing economic and financial issues beyond the remit of any one organization.

How it helps?

- The **Green Climate Fund** will support projects, programmes, policies and other activities in developing country Parties using thematic funding windows.
- It is intended to be the **centrepiece of efforts to raise Climate Finance of \$100 billion a year by 2020**.
- The Fund will promote the paradigm shift towards low-emission and climate-resilient development pathways by providing support to developing countries to limit or reduce their greenhouse gas emissions and to adapt to the impacts of climate change, taking into account the needs of those developing countries particularly vulnerable to the adverse effects of climate change.
- The **Fund** will strive to maximize the impact of its funding for adaptation and mitigation, and seek a balance between the two, while promoting environmental, social, economic and development co-benefits and taking a gender-sensitive approach.

Who will govern the Fund?

- The Fund is **governed and supervised by a Board** that will have **full responsibility** for funding decisions and that receives the guidance of the **Conference of Parties (COP)**.
- The Fund is accountable to and functions under the guidance of, the **COP**.

What are carbon border taxes-

- The carbon border tax involves imposing an import duty on a product manufactured in a country with more lax climate rules than the one buying it.
- **Carbon Border Adjustment mechanism (CBAM):**
 - The **Carbon Border Adjustment Mechanism** is a plan from the **European Union (EU)** to **tax carbon-intensive products**, such as **iron and steel, cement, fertiliser, aluminium and electricity generation**, from **2026**.
 - The **CBAM** will equalise the price of carbon between domestic products and imports and ensure that the EU's climate objectives are not undermined by production relocating to countries with less ambitious policies.

30. Rajasthan's Tal Chhapar sanctuary gets protection from plan to reduce its size

Context: Tal Chhapar blackbuck sanctuary in Rajasthan's Churu district has received a protective cover against a proposed move of the State government to reduce the size of its eco-sensitive zone.

Details:

- The court recently ordered a **"complete prohibition"** on any action to reduce the wildlife sanctuary's area.
- The **World Wildlife Fund for Nature (WWF)** has also taken up a major project for the conservation of raptors in the sanctuary, spread in an area measuring 7.19 sq. km.

About the Tal Chhapar sanctuary:

- **Tal Chhapar Sanctuary** is a sanctuary located in the **Churu district of Northwestern Rajasthan**, in the Shekhawati region of India.
- It is **known for blackbucks** and is also home to a variety of birds.
- The sanctuary is **210 km from Jaipur** on the fringe of the **Great Indian Desert**.
- **Geology and climate:**
 - Tal Chhapar Sanctuary, with an almost **flat tract** and **interspersed shallow low-lying areas**, has **open grassland with scattered Acacia and Prosopis trees** which give it an appearance of a **typical savanna**.
- **Flora and Fauna:**
 - The sanctuary is host to about **4,000 blackbucks** and other wild animals, over **40 species of raptors** and **more than 300 species of resident and migratory birds**.
 - The raptors, which include predators and scavengers, are on top of the food chain and control the populations of small mammals, birds and reptiles as well as insects.
 - The sanctuary earlier had a **large population of desert foxes** and similar burrowing animals, while the large colonies of the **only herbivorous lizard, the spiny-tailed lizard**, exist as the prey base for raptors.

Threats to the sanctuary:

- The issues confronting the sanctuary include hyper-aridity, grazing pressure, the invasive weed **Prosopis juliflora**, and **salt mines** in the vicinity.
- The sanctuary's area is **insufficient for its large blackbuck population**.

Monitoring of the sanctuary:

- As Tal Chhapar attracts a large number of **raptor species** for their habitation, the **World Wildlife Fund for Nature (WWF)** has started monitoring them to understand their status and distribution in the sanctuary.

Blackbucks (Antelope cervicapra):

- Also known as the **Indian antelope**.
- **Native to India and Nepal**.
- It inhabits **grassy plains and lightly forested areas** with perennial water sources.

Blackbuck sanctuaries in India:

1. Tal Chhapar sanctuary, Rajasthan
2. Ranebennur blackbuck sanctuary, Karnataka
3. Jayamangali blackbuck sanctuary, Karnataka
4. Rehekuri blackbuck sanctuary, Maharashtra
5. Velavadar blackbuck national park, Gujarat

Conservation Efforts:

- **Raptors MoU (Global):** The Memorandum of Understanding on **the Conservation of Migratory Birds of Prey in Africa and Eurasia** is also known as Raptors MoU.
- It is an **agreement under Convention on the Conservation of Migratory Species of Wild Animals (CMS)**.
- **CMS or Bonn Convention** provides a global platform for the conservation and sustainable use of migratory animals and their habitats.
- It is not legally binding.

India's Conservation Efforts:

- India is a **signatory to Raptors MoU**.
- For the conservation of vultures, India has launched a **Vulture Action Plan 2020-25**.
- India is also a **part of the SAVE** (Saving Asia's Vultures from Extinction) consortium.
- The **Jatayu Conservation Breeding Centre in Pinjore** (Haryana) is the world's largest facility within the state's Bir Shikargah Wildlife Sanctuary for the breeding and conservation of Indian vulture species.

31. India's coal production to surpass a billion tonnes by 2025: IEA annual report

Context: Its own coal production will surpass a **billion tonnes by 2025**, the annual report of the **International Energy Agency (IEA)**, predicted on December 16, 2022.

Report analysis:

- **Report name:** Coal 2022: Analysis and forecast to 2025
- **India**, along with **China**, is the **world's largest coal producer, consumer and importer**.
- **India's coal consumption** has **doubled** since **2007** at an **annual growth rate of 6 per cent**.
- **India and China**, are also the **only two countries globally** where there has been an uptick in investment in **coal mine assets**.

Global Coal demand:

- Global coal demand reached **eight billion tonnes** this year.
- The **Russia-Ukraine war** has sharply altered the dynamics of the coal trade, price levels, and supply and demand patterns in 2022.
- In **India and China**, where **coal is the backbone of electricity systems** and **gas accounts for just a fraction of power generation**, the impact of steeper gas prices on coal demand has been limited.
- The spike in the prices of gas due to the war as well as lower output from hydro and nuclear led to 'fuel switching' to coal in the European Union to generate power.

Why coal demand is rising in India?

- According to the projections by **Climate Action Tracker**, fossil fuel makes up for **over half the installed energy capacity** in the country and is expected to touch around **266 gigawatts by 2029-2030**.
- **Domestic coal requirement** is expected to **rise to 1,018.2 million tonnes by 2031-32** from **678 MT in 2021-2022**.
- This means coal consumption will **increase 40% in India**.
- **Reasons:**
 - **Iron and steel production** uses coal and there are not many technologies to replace the fuel immediately.
 - Continued expansion of India's economy is expected during **2022-2024**, with **annual average GDP growth of 7.4%, fuelled partially by coal**.

- India's push to **domestic coal mining** through both **Coal India** and **auction of coal blocks to private companies**, coal usage in India will increase as it plateaus in other parts of the world, including China.
- The central government has **opened up coal mining for the private sector**, claiming it as one of its most ambitious coal sector reforms.

Coal in India

(Million tonnes)

State	Proved	Indicated	Inferred	Total
JHARKHAND	45563	31439	6150	83152
ODISHA	37391	34165	7739	79295
CHHATTISGARH	20428	34576	2202	57206
WEST BENGAL	14156	12869	4643	31667
MADHYA PRADESH	11958	12154	3875	27987
TELANGANA	10475	8576	2651	21702
MAHARASHTRA	7178	3074	2048	12299
ANDHRA PRADESH	0	1149	432	1581
BIHAR	161	813	392	1367
UTTAR PRADESH	884	178	0	1062
MEGHALAYA	89	17	471	576
ASSAM	465	57	3	525
NAGALAND	9	0	402	410
SIKKIM	0	58	43	101
ARUNACHAL PRADESH	31	40	19	90
Total	148787	139164	31069	319020

CATEGORIZATION OF RESOURCES

The Coal resources of India are available in older Gondwana Formations of peninsular India and younger Tertiary formations of north-eastern region. Based on the results of Regional/Promotional Exploration, where the boreholes are normally placed 1-2 Km apart, the resources are classified into 'Indicated' or 'Inferred' category. Subsequent Detailed Exploration in selected blocks, where boreholes are less than 400 meters apart, upgrades the resources into more reliable 'Proved/Measured' category

Climate Action Tracker (CAT):

- Climate Action Tracker is an **independent scientific analysis** produced by two research organizations **tracking climate action since 2009**. It monitors **32 countries**, accounting for more than 80 percent of global emissions.
- The Climate Action Tracker is an independent scientific analysis that tracks government climate action and measures it against the **globally agreed Paris Agreement** aim of "holding warming well below 2°C and pursuing efforts to limit warming to 1.5°C."
- A collaboration of two organizations, **Climate Analytics and New Climate Institute**, the CAT has been providing this independent analysis to policymakers since 2009.

32. Burp control:

How can methane released in livestock belches be reduced? Scientists are trying various options

Context: Central Institute for Research on Buffaloes in Haryana, has prepared a feed supplement that can **reduce a potent greenhouse gas (i.e. Methane)** belched out by stock animals like cattle, goats and sheep.

Diet check:

- **Ruminants** have specialised digestive systems in which microorganisms like **fungi, bacteria, protozoa and archaea** thrive, and help in the digestion of otherwise indigestible cellulose-rich plants.
- Among them, **Archaea** is responsible for producing **methane**.
- Researchers have targeted to **reduce the algae population** without affecting the digestion and productivity of the animals.

- They have concocted the supplements using Indian cherry and Indian elm leaves, garlic oil, mustard oil, cottonseed oil, sodium nitrate and magnesium sulphate.

Seaweed, another option:

- Globally, there is a race to develop different strategies to reduce methane production in ruminants.
- EU approved a feed supplement named **Bovaer** which is a fine granular powder containing **3-nitrooxypropanol**, which inhibits an essential enzyme responsible for methane production.
- **Seaweed**, particularly **Asparagopsis taxiformis**, a **red alga** growing in tropical and subtropical waters, has the potential to reduce methane emissions from animals.

Issue in seaweeds:

- Seaweed appears to inhibit the release of greenhouse gases through two chemicals, **bromoform** and **bromochloromethane**, which can **induce cancer**.
- It has an objectionable odour.

Methane gas:

- The **warming effect of methane is 30 times greater than CO₂**, it is **shorter-lived** and lasts in the atmosphere for **about 12 years**.
- By contrast, **CO₂** lingers for centuries. Reducing methane emissions has therefore been touted as one of the most immediate opportunities to slow global heating.
- In **2021**, over **100 countries** signed the **Global Methane Pledge**, where signatories agreed to take **voluntary steps to reduce global methane emissions by 30 per cent from 2020 levels** by the end of the decade.
- This could eliminate over **0.2°C** warming by **2050**.

33. Non-fossil energy Shopping for net-zero in carbon markets

Context: The **Energy Conservation (Amendments) Bill, 2022**, passed by the Rajya Sabha recently, **mandates the use of non-fossil energy sources** such as **biomass, ethanol** and **green hydrogen** to ensure **faster decarbonisation** of the Indian economy.

Features of the act:

- The current trading schemes in India — **energy saving certificates (ESCerts)** and **renewable energy certificates (RECs)** will be **merged into** a single commodity called **‘carbon credits certificate’ (CCC)** and operate under the **‘cap and trade’ system** of the **National ETS**.
 - With the **implementation of the National ETS**, the domestic carbon credits market will enable the development of higher quality sources of carbon credits, benefiting both buyers and sellers and, ultimately, supporting progress toward a low-carbon future.
- **It empowers the central government to specify a trading scheme for carbon credits.**
 - Under this, the **central government or any authorised agency** may **issue carbon credit certificates** to entities registered and compliant with the scheme.
 - The entities can trade the certificates. Anyone can purchase a carbon credit certificate on a voluntary basis.
- **The Act will encourage the use of non-fossil sources of energy.**
 - It empowers the government to direct **‘designated consumers’** to meet a **minimum share of energy consumption from non-fossil sources**.
 - **Different consumption thresholds** may be specified for **different non-fossil sources** for the designated consumers who comprise
 - i.industries such as mining, steel, cement, textile, chemicals, and petrochemicals;
 - ii.transport sector including railways; and
 - iii.commercial buildings, as specified in the schedule.

Scope of the act:

- It brings **large residential buildings** within the scope of the **Energy and Sustainable Building Code**.
 - The new code will provide **norms for energy efficiency and conservation, the use of renewable energy**, and other requirements for **green buildings**.
 - Under the Bill, the **new Energy Conservation and Sustainable Building Code** will also **apply to office and residential buildings** meeting the above criteria.
- **Energy consumption standards** may be specified for equipment and appliances that consume, generate, transmit, or supply energy.
 - It expands the scope to include **vehicles** (as defined under the Motor Vehicles Act, 1988), and **vessels** (including ships and boats).

Formation of National carbon registry:

- A new ‘**registered entity**’ — the **National Carbon Registry**, under the **central government** or an agency authorised by it, has been proposed for registering new projects with ‘**measurement, verification and reporting**’ protocols in line with international registry systems.
- ‘**Designated consumers**’ and other consumers deemed appropriate will be part of the scheme — the ‘**obligated entity**’ will be allowed to sell and purchase CCCs. Other entities (non-obligated) can participate as purchasers.
- A **national carbon registry** under the **Bureau of Energy Efficiency** or a future ‘**carbon regulatory commission**’ will be formulated and linked to the **Centralised Accounting and Reporting Platform (CARP)** of the **Article 6** supervisory body of the **United Nations Framework Convention on Climate Change (UNFCCC)**.

Carbon Credits:

- A carbon credit is a **permit** that allows the company that holds it to emit a certain amount of **CO₂** or other **greenhouse gases**.
- One credit permits the emission of a mass equal to one tonne of carbon dioxide.
- These were devised as a **market-oriented mechanism to reduce greenhouse gas emissions**.
- Companies get a set number of credits, which decline over time.
- They can sell any excess to another company.

34. COP15: Kunming-Montreal Global Biodiversity Framework adopted

Context: The **15th Conference of Parties (COP15)** to the **UN Convention on Biological Diversity (CBD)** adopted the **Kunming-Montreal Global Biodiversity Framework (GBF)** December 19, 2022.

About the Kunming-Montreal Global Biodiversity Framework (GBF):

- The framework has **4 long-term goals** to be achieved by **2050** and **23 targets** that the world needs to **achieve by 2030**.
 - In **2020**, the world failed to meet the last set of targets, the **Aichi Targets**.
- The countries will **monitor and report every five years or less** on a large set of indicators related to progress.
- The **CBD** will combine national information submitted by late February 2026 and late June 2029 into global trends and progress reports.

4 Long-term goals are:

Goal A	<ul style="list-style-type: none"> • The integrity, connectivity and resilience of all ecosystems are maintained, enhanced, or restored, substantially increasing the area of natural ecosystems by 2050; • Human-induced extinction of known threatened species is halted, and, by 2050, extinction rate and risk of all species are reduced tenfold and the abundance of native wild species is increased to healthy and resilient levels; • The genetic diversity within populations of wild and domesticated species, is maintained, safeguarding their adaptive potential
Goal B	<ul style="list-style-type: none"> • Biodiversity is sustainably used and managed and nature’s contributions to people, including ecosystem functions and services, are valued, maintained and enhanced, with those currently in decline being restored, supporting the achievement of sustainable development for the benefit of present and future generations by 2050.
Goal C	<ul style="list-style-type: none"> • The monetary and non-monetary benefits from the utilization of genetic resources, and digital sequence information on genetic resources, and of traditional knowledge associated with genetic resources, as applicable, are shared fairly and equitably, including, as appropriate with indigenous peoples and local communities, and substantially increased by 2050, while ensuring traditional knowledge associated with genetic resources is appropriately protected, thereby contributing to the conservation and sustainable use of biodiversity, in accordance with internationally agreed access and benefit-sharing instruments.
Goal D	<ul style="list-style-type: none"> • Adequate means of implementation, including financial resources, capacity-building, technical and scientific cooperation, and access to and transfer of technology to fully implement the Kunming-Montreal global biodiversity framework are secured and equitably accessible to all Parties, especially developing countries, in particular the least developed countries and small island developing States, as well as countries with economies in transition, progressively closing the biodiversity finance gap of 700 billion dollars per year, and aligning financial flows with the Kunming-Montreal Global Biodiversity Framework and the 2050 Vision for Biodiversity.

The 23 targets are:

Targets	Details
1	<ul style="list-style-type: none"> Ensure that all areas are under participatory integrated biodiversity inclusive spatial planning and/or effective management processes addressing land and sea use change, to bring the loss of areas of high biodiversity importance, including ecosystems of high ecological integrity, close to zero by 2030, while respecting the rights of indigenous peoples and local communities.
2	<ul style="list-style-type: none"> Ensure that by 2030 at least 30 per cent of areas of degraded terrestrial, inland water, and coastal and marine ecosystems are under effective restoration.
3	<ul style="list-style-type: none"> Ensure and enable that by 2030 at least 30 per cent of terrestrial, inland water, and of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem functions and services, are effectively conserved and managed.
4	<ul style="list-style-type: none"> Ensure urgent management actions to halt human induced extinction of known threatened species.
5	<ul style="list-style-type: none"> Ensure that the use, harvesting and trade of wild species is sustainable, safe and legal, preventing overexploitation, minimizing impacts on non-target species and ecosystems, and reducing the risk of pathogen spill-over, applying the ecosystem approach, while respecting and protecting customary sustainable use by indigenous peoples and local communities.
6	<ul style="list-style-type: none"> Eliminate, minimize, reduce and or mitigate the impacts of invasive alien species on biodiversity and ecosystem services by at least 50 per cent, by 2030.
7	<ul style="list-style-type: none"> Reduce pollution risks and the negative impact of pollution from all sources, by 2030.
8	<ul style="list-style-type: none"> Minimize the impact of climate change and ocean acidification on biodiversity and increase its resilience through mitigation, adaptation, and disaster risk reduction actions, including through nature-based solution and/or ecosystem-based approaches
9	<ul style="list-style-type: none"> Ensure that the management and use of wild species are sustainable, thereby providing social, economic and environmental benefits for people
10	<ul style="list-style-type: none"> Ensure that areas under agriculture, aquaculture, fisheries and forestry are managed sustainably, in particular through the sustainable use of biodiversity
11	<ul style="list-style-type: none"> Restore, maintain and enhance nature's contributions to people, including ecosystem functions and services, such as regulation of air, water, and climate, soil health, pollination and reduction of disease risk, as well as protection from natural hazards and disasters, through nature-based solutions and/or ecosystem-based approaches for the benefit of all people and nature.
12	<ul style="list-style-type: none"> Significantly increase the area and quality and connectivity of, access to, and benefits from green and blue spaces in urban and densely populated areas sustainably
13	<ul style="list-style-type: none"> Take effective legal, policy, administrative and capacity-building measures at all levels, as appropriate, to ensure the fair and equitable sharing of benefits that arise from the utilization of genetic resources and from digital sequence information on genetic resources, as well as traditional knowledge associated with genetic resources, and facilitating appropriate access to genetic resources, and by 2030 facilitating a significant increase of the benefits shared, in accordance with applicable international access and benefit-sharing instruments.
14	<ul style="list-style-type: none"> Ensure the full integration of biodiversity and its multiple values into policies, regulations, planning and development processes, poverty eradication strategies, strategic environmental assessments, environmental impact assessments and, as appropriate, national accounting, within and across all levels of government and across all sectors,

15	<ul style="list-style-type: none"> Take legal, administrative or policy measures to encourage and enable business, and in particular to ensure that large and transnational companies and financial institutions: <ol style="list-style-type: none"> Regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity, including with requirements for all large as well as transnational companies and financial institutions along their operations, supply and value chains and portfolios; Provide information needed to consumers to promote sustainable consumption patterns; Report on compliance with access and benefit-sharing regulations and measures, as applicable
16	<ul style="list-style-type: none"> Ensure that people are encouraged and enabled to make sustainable consumption choices and by 2030, reduce the global footprint of consumption in an equitable manner
17	<ul style="list-style-type: none"> Establish, strengthen capacity for, and implement in all countries in biosafety measures as set out in Article 8(g) of the Convention on Biological Diversity and measures for the handling of biotechnology and distribution of its benefits as set out in Article 19 of the Convention
18	<ul style="list-style-type: none"> Identify by 2025, and eliminate, phase out or reform incentives, including subsidies, harmful for biodiversity, in a proportionate, just, fair, effective and equitable way, while substantially and progressively reducing them by at least 500 billion United States dollars per year by 2030
19	<ul style="list-style-type: none"> Substantially and progressively increase the level of financial resources from all sources, in an effective, timely and easily accessible manner. by 2030 mobilizing at least 200 billion United States dollars per year
20	<ul style="list-style-type: none"> Strengthen capacity-building and development, access to and transfer of technology, and promote development of and access to innovation and technical and scientific cooperation
21	<ul style="list-style-type: none"> Ensure that the best available data, information and knowledge, are accessible to decision makers, practitioners and the public to guide effective and equitable governance, integrated and participatory management of biodiversity,
22	<ul style="list-style-type: none"> Ensure the full, equitable, inclusive, effective and gender-responsive representation and participation in decision-making, and access to justice and information related to biodiversity by indigenous peoples and local communities.
23	<ul style="list-style-type: none"> Ensure gender equality in the implementation of the framework through a gender-responsive approach.

Creation of a dedicated fund:

- The **Global Environment Facility** has been requested to establish a **Special Trust Fund** to support the implementation of the **Global Biodiversity Framework (“GBF Fund”)**.
- Delegates have agreed to establish within the **GBF** a **multilateral fund for the equitable sharing of benefits** between providers and users of **digital sequence information on genetic resources (DSI)**, to be finalised at **COP16** in **Türkiye** in **2024**.

35. India not joining the Oil & Gas Methane Partnership is a missed opportunity

Context: The **Methane Alert and Response System (MARS)** initiative was launched by the **United Nations Environment Programme (UNEP)** at the **27th Conference of Parties (COP27)** to the United Nations Framework Convention on Climate Change on November 11, 2022.

About the Methane Alert and Response System (MARS):

- MARS** is a **satellite-based** system to **detect methane emissions** and help industries and governments in mitigating them.
- It is the **first publicly available system** for monitoring any greenhouse gas emissions.
- It will map out **major methane-detection events** that will help **UNEP** to corroborate methane emissions reported by companies and analyse changes over time.
- The initiative is funded by the European Commission, the US government, Global Methane Hub and the Bezos Earth Fund.

Working mechanism of MARS:

- It works by **integrating different satellite systems**, starting with the satellite being managed by the **European Space Agency** called **Sentinel 5P**. (Sentinel 2 and **PRISMA** are two other satellite involved in the system.)
 - It has a **global coverage on a daily basis** that we are going to be using to identify large methane plumes every day.
- It will use the data to generate an enhanced **map of methane hotspots**.
- **MARS** will work closely with the **Oil and Gas Methane Partnership (OGMP)** members.
- There are two systems at work to measure methane emissions.
 1. The **Quicker one** can detect the methane emissions with a rate of 10-15 ton per hour.
 2. The **slower one** can detect the methane emissions of slower rate- around 1 tonne per hour. It will be used for deeper analysis.

Oil and Gas Methane Partnership (OGMP):

- The **Oil and Gas Methane Partnership (OGMP)**, launched at the **2014 United Nations (UN) Secretary General's Climate Summit**, was created by the **Climate and Clean Air Coalition (CCAC)** and the **United Nations Environmental Programme (UNEP)** as a voluntary initiative to help companies **reduce methane emissions** in the oil and gas sector.
- Governments, international organizations, non-government organizations, and the oil and gas industry collaborate through the **OGMP** to raise awareness and responsibly address methane emissions.
- The **OGMP** provides a protocol to help companies systematically manage their methane emissions from upstream oil and gas operations, as well as offers a credible platform to help member companies demonstrate actual reductions to industry stakeholders.
- More than **15 percent of global natural gas production** is represented by the **10 OGMP** member companies: BP, Ecopetrol, Eni, Equinor, Neptune Energy International SA, Pemex, PTT, Repsol, Shell, and Total.
- There are **no Indian companies** that have joined the **OGMP**.

Global Methane pledge:

- The **global methane pledge** was adopted during **COP26**.
- Under it, countries agreed to **reduce global methane emissions by 30 per cent by 2030**.
- This will help to limit global warming to 1.5 degrees above pre-industrial levels.
- **Methane** is around **25 times** more potent as a greenhouse gas than carbon dioxide and currently contributes to around a **quarter of global warming**. Its reduction is, thus, crucial for mitigating climate change.

36. Lancet's new commission aims to tackle potential public health threats for this century

Context: Leading general medical journal **The Lancet** announced a **new commission** December 15, 2022 to **address public health threats**.

About the new commission:

- **Name:** The Lancet Commission on 21st-Century Global Health Threats
- **Scope of work:** It includes global health threats like:
 - demographic changes and inverted population pyramids,
 - high body mass index,
 - antimicrobial resistance,
 - eroding sexual and reproductive rights for women,
 - food insecurity, and
 - fraying multilateralism
- In **2024**, the body will **release its recommendations** after assessing evidence presented by working groups over the course of the next two years.
- **Chairman:**
 - **Natalia Kanem**, the executive director of the **United Nations Fund for Population Activities**, and **Christopher JL Murray**, director of the **Institute for Health Metrics and Evaluation (IHME)**, an independent population health research centre at the University of Washington Medicine, United States.
- **Members of the commission** come from **diverse backgrounds**:
 - Current and former heads of state,
 - intergovernmental organisation leaders,
 - leaders of public health institutions, global health funders, global health thought leaders, and
 - civil society and youth organisations.
- **The body will have a four-pronged approach:**
 1. Utilise available data from the Global Burden of Disease and related reference health forecasts as a foundation for a heterogenous debate on global and regional health threats;
 2. explore alternative forecasting options;

3. search for solutions which can be adopted by a diverse population at a global and regional scale; and
4. produce “roadmaps that governments, donors and other stakeholders can use to translate findings into investment priorities”.

Commissions formed in the backdrop of global pandemic:

- Pan-European Commission on Health and Sustainable Development,
- The Independent Panel for Pandemic Preparedness and Response,
- The G20 High Level Independent Panel on Financing,
- The Global Commons for Pandemic Preparedness and Response and
- The Intergovernmental Panel on Climate Change

37. New air filter technology found to deactivate over 99% of SARS-CoV-2 delta variant

Context:

- A team of researchers from the **Indian Institute of Science (IISc), Bengaluru** have developed **air filters** made of ingredients commonly found in **green tea**. **Antimicrobial filters** can destroy germs and remove them from their system.

Details:

- The **novel antimicrobial air filters** were tested at an accredited laboratory.
- They were found to **deactivate the delta variant of SARS-CoV-2** with an efficiency of **99.24 per cent**.
- The innovation holds promise to develop **antimicrobial filters** that can prevent epidemics by air-borne pathogens.
- **Ingredients used in the air filters are: polyphenols and polycationic polymers** commonly found in **green tea**.
 - These ‘green’ ingredients can **rupture the microbes** through **site-specific binding**.

Significance:

- Over continuous usage, the **existing air filters** become a **breeding ground for captured germs**.
- The growth of these germs clogs the filter’s pores, reducing its life.
- Resuspension of these germs can infect people in the vicinity.
- These **novel antimicrobial filters** in the air conditioners, central ducts and air purifiers can play a crucial role in the fight against air pollution and mitigate the spread of air-borne pathogens like coronaviruses.
- This technology was transferred to **AIRTH**, a startup that is replacing the existing germ-growing air filters with germ-destroying air filters for commercialisation.

Severity of air pollution:

- A recent study found that countries with higher rates of stillborn babies had higher amounts of fine particulate pollution.
- India led the list with the **highest average number of stillbirths** — **217,000** out of 25 million births each year.
- **South Asia, sub-Saharan Africa and the Arabian Desert** were hotspots of **PM 2.5-related stillbirths** due to high exposure and baseline stillbirth rate.
- **India** had an **average drop of 3.86 years** in life expectancy due to air pollution, which caused **1.8 million premature deaths in 2015**.

38. Asian Giant Tortoises released into Nagaland protected area for rewilding

Context:

- Ten captive-bred Asian Giant Tortoise (*Manouria emys*) juveniles were released into a protected area of Nagaland on December 19, 2022, according to T Aochuba, director, Intanki National Park.

Soft release of the tortoise:

- The **Nagaland Forest Department** and non-profits **Turtle Survival Alliance** and **Wildlife Conservation Society India** conducted a **soft release** of the juvenile tortoises with the objective to rewild the species and population recovery.
- The **soft release** is a **process of gradually releasing captive-raised species into the wild**.
- The **method** helps the species to **develop site fidelity** among released individuals and eventually develop the habit to live in the vicinity of the release closure.

About the Asian Giant Tortoise:

- The **Asian Giant tortoise** (*Manouria emys*), also known commonly as the **Mountain tortoise**, is a species of tortoise in the family **Testudinidae**.
- The species is **endemic to Southeast Asia**.
- It is believed to be among the **most primitive of living tortoises**, based on molecular and morphological studies.
- **Asian Giant Tortoises** are found in **Bangladesh, India, Indonesia, and Malaysia** among other places.
- Listed as ‘**critically endangered**’ under the **International Union for Conservation of Nature Red List of Threatened Species**.

- **Threats include** Over-exploitation and unsustainable use for consumption by local communities resulting in the species being pushed to the brink of extinction.
- **Conservation efforts:** The **Joint Asian Giant Tortoise Recovery Project** started in **2017** with the **Nagaland Zoological Park (NZP)** and **Turtle Survival Alliance (TSA)**.

About the Ntangki National Park:

- **Ntangki National Park** is a national park located in the **Peren District** of **Nagaland**, India.
- It was first designated as a national park in **1993**.
- Among the species that inhabit the park are the rare hoolock gibbon, golden langur, hornbill, Asian palm civet, black stork, tiger, white-breasted kingfisher, monitor lizard, python and sloth bear.
- The name "**Ntangki**" is derived from the **Zeme dialect** of the **Zeliangrong Nagas**.

39. New health threat?

Pathogens frozen in permafrost resurface as Earth heats up

Context:

- A warming planet is resulting in the **loss of the Earth's cryosphere** — parts of the planet where water is permanently frozen such as glaciers and ice sheets, and this could be resurrecting **trapped pathogens**, giving rise to potential public health threats, find a new study.

Details about the study:

- Researchers analysed samples from seven different ancient Siberian permafrost sites and pieced together preliminary characterisations of **13 new viruses**.
 - Two viruses viz **pithovirus** and **mollivirus** were identified.
- The viruses studied so far only infect amoeba and are of no real threat to humans or animals.
- **Another route of a potential viral threat** could be the **thawing of dead people** who possibly died of an infection.
 - A **300-year-old frozen mummy** from **Siberia** was found to contain the **variola virus** that causes smallpox.
 - Bodies exhumed from Alaska's permafrost contributed to understanding the **1918 Spanish flu virus genome**.
- Researchers warned that **each new virus**, even related to known families, almost always requires the development of **highly specific medical responses**, such as **new antivirals or vaccines**.
 - There is no equivalent to '**broad spectrum antibiotics**' against viruses, because of the **lack of universally conserved druggable processes** across the different viral families.
- **Russia's Yamal peninsula witnessed an anthrax outbreak:** Abnormally high ambient temperature in the summer of 2016 contributed to the **thawing of permafrost** and **viable Bacillus anthracis (anthrax-causing bacteria)** spores could have become exposed to the surface.
- The research paper also made an interesting observation about **antibiotic-resistance genes** being **prevalent in permafrost**.

Natural reservoirs of pathogens:

- In infectious disease ecology and epidemiology, a natural reservoir, also known as a **disease reservoir** or a **reservoir of infection**, is the population of organisms or the specific environment in which an infectious pathogen naturally lives and reproduces, or upon which the pathogen primarily depends for its survival.
- **Animal reservoirs:** A reservoir is usually a living host of a certain species, such as an animal or a plant, inside of which a pathogen survives, often (though not always) without causing disease for the reservoir itself.
- **Ecosystem reservoirs:** By some definitions, a reservoir may also be an **environment external to an organism**, such as a **volume of contaminated air or water**.

40. India garners international support to save two endangered freshwater turtles

- Conference of the parties (CoP19) to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) recently concluded at Panama City.
- The 19th Conference of the Parties to CITES is being asked to consider stricter trade regulations for nearly six hundred species of animals and plants believed to be under increased threat of extinction from international trade.
- India's proposal to regulate trade in **Leith's softshell turtle (Nilssononia leithi)** by shifting its listing to the highest category (from Appendix II to Appendix I) – threatened with extinction and necessitating regulation of trade – was accepted.
- The country's proposal for induction of **freshwater red-crowned roofed turtle (Batagur kachuga)**, too "earned wide support" of the participating countries, and was "widely appreciated and well accepted" when introduced, the ministry of environment, forests and climate change (MoEFCC) said.

Leith's Soft-shelled Turtle

- Leith's Softshell Turtle (*Nilssonia leithii*) is a large freshwater soft-shelled turtle which is **endemic to peninsular India** and it inhabits rivers and reservoirs.

Protection Status:

- The International Union for Conservation of Nature (IUCN) Red List: **Critically Endangered**
- Wildlife Protection Act (WPA): **Schedule IV**
- CITES: **Appendix I**

Red Crowned Roofed Turtle

- Red Crowned Roofed Turtle (*Batagur kachuga*) is one of the 24 species endemic to India, is characterised by the bright colours such as red, yellow, white and blue on the faces and necks of the males.
- It is a freshwater turtle species native to India, Bangladesh and Nepal.
- Historically, the species was widespread in the Ganga River, both in India and Bangladesh. It also occurs in the Brahmaputra basin.
- Currently in India, the National Chambal River Gharial Sanctuary is the only area with a substantial population of the species, but even this Protected Area and habitat are under threat.

Conservation Status:

- The International Union for Conservation of Nature (IUCN) Red List: **Critically Endangered**
- Wildlife Protection Act (WPA): **Schedule I**
- CITES: **Appendix II**.

41. Why camels' number declining in India

In the news:

- The camel population in India has been in decline, especially in **Rajasthan** because of the **Indira Gandhi Canal** which **hampered the movement of Raikas and Camels**.

Camel population:

- The number of camels has **come down** from **4 lakh** during the livestock census of 2012 to **2.52 lakh** in the 2019 livestock census, showing a **decline of 37 per cent**.
- Around **84 per cent of camels** in India are located in **Rajasthan** and another **11 per cent** in **Gujarat**.

Reasons behind the decline in the camel population:

- Fewer dairy benefits:**
 - Long gestation period (15 months);
 - limited saleable meat yield (less than 5 kg a day),
 - high cost of maintenance,
 - high cost of milk, and
 - strong flavour of camel milk,
 - all make it unsuitable for the domesticating camel for economic benefits.
- Change in lifestyle:**
 - Replacement** of the **nomadic-pastoral way of life** by agriculture.
 - Individually owned farmlands that are often fenced restrict the movements of camels.
 - Camels are rarely used for ploughing along with that **shrinking of grazing grounds**,
 - shortage of fodder** also a reason for reduced camel population.
- Other means of transport:**
 - Camels are replaced largely by road networks.
 - People prefer **vehicle for transportation** rather than using camel.
- Fewer benefits for Raikas:**
 - Raikas do not sell dead camels for their bones and also do not eat camel meat.
 - Raikas believe they were born of Lord Siva's skin to protect camels.

Raikas:

- The **Raikas** are a **specialized caste of pastoralists** from **northwestern India**, particularly the **arid and semi-arid parts of Rajasthan**.
- Although they also raise goats, cattle, sheep, and water buffalo, the most important animal for Raika's cultural identity is the camel.
- The **Raika and their camels talk to each other**; this language/conversation is called **akal-dhakaal**.

Kharai camel:

- It is a **unique breed of camels** found **only in Kachchh, Gujrat**.
- They have the special ability to survive on both, dry land and in the sea.
- They **swim in seawater** and **feed on saline plants and mangroves**.
- The Kharai was recognised as a separate breed in 2015 by the **Indian Council of Agricultural Research (ICAR)**.

Double humped camel:

- The **double-hump camel** is a **native of Gobi desert**, and is found on a vast expanse of cold-desert areas across Mongolia, China, Kazakhstan, Turkmenistan, Uzbekistan and parts of Afghanistan.

Rearing centre:

- According to the **Gujarat government**, the **camel rearing centre at Dhor, Kutchh**, is working in a scientific manner for the purpose of increasing the number of camels through pure breeding.

Rajasthan government's step to protect camels:

- Rajasthan government has declared camel as State animal in 2014.
- Rajasthan's government enacted The **Rajasthan Camel (Prohibition of Slaughter and Regulation of Temporary Migration or Export) Act, 2015**.
- The Act aims to **prohibit the slaughter of camels** and also to regulate their temporary migration or export from Rajasthan.
- But the **Act does not show positive results**.
- Camels are now sold in the grey market, further driving down camel prices.
- Camels that should normally command a price of Rs 40,000 plus, reportedly sell in this grey market for less than Rs 5,000.
- The ban has benefitted only the meat traders and corrupt officials.

42. ITC looking to scale up interventions in climate smart agriculture**Context:**

- climate-smart agriculture (CSA) is an approach for transforming and reorienting agricultural production systems and food value chains so that they support sustainable development and can ensure food security under climate change.
- Climate-smart agriculture (CSA) is an integrated approach to managing landscapes—cropland, livestock, forests and fisheries—that addresses the interlinked challenges of food security and accelerating climate change.
- **CSA aims to simultaneously achieve three outcomes:**
 - Increased productivity
 - Enhanced resilience
 - Reduced emissions
- The principal goal of CSA is identified as food security and development, while productivity, adaptation, and mitigation are identified as the three interlinked pillars necessary for achieving this goal.
- Since the introduction of the concept in 2010 by the Food and Agriculture Organization (FAO), a number of technologies have been developed and applied in India.
- CSA supports the FAO Strategic Framework 2022-2031 based on the Four Betters: better production, better nutrition, a better environment and a better life for all, leaving no one behind.

India and Climate Smart Agriculture:

Indian Council of Agricultural Research (ICAR), Ministry of Agriculture and Farmers Welfare, Government of India has launched a flagship network project “**National Innovations in Climate Resilient Agriculture (NICRA)**” aiming at strategic research on adaptation and mitigation, demonstration of technologies on farmers' fields and creating awareness among farmers and other stakeholders. The following steps have been taken in the field of climate smart agriculture:

- Developed climate resilient varieties for different abiotic and biotic stresses in major crops. So far 8 climate resilient varieties have been released in rice, green gram, maize and lentil;
- Developed and popularized 65 location-specific climate resilient/smart technologies for wider adoption among the farming communities;
- Prepared 650 district agricultural contingency plans and sensitized State officials for preparedness through 54 State-level interface meetings;
- Developed, evaluated and commercialized implements (raised bed planter-cum-herbicide applicator, maize harvester, zero till planter, etc.) for small farm mechanization suiting to dryland ecologies;
- Climate smart technologies developed involving farmers in risk assessment and adaptation techniques in 151 clusters covering 446 villages, with a footprint of 2,13,421 households, on 2,35,874 hectares of land;
- Capacity building programs have been taken up involving 5.15 lakhs comprising researchers, farmers, entrepreneurs, line department officials, policy makers and NGOs in the field of climate resilient agriculture.

Further, the climate smart agriculture is promoted under the Central Sector Schemes of Pradhan Mantri Krishi Sinchayee Yojna (PMKSY), Parmparagat Krishi Vikas Yojna (PKVY), Soil Health Mission (SHM), National Bamboo Mission (NBM) and Sub Mission on Agro Forestry (SMAF).

The Government of India has launched the **National Mission for Sustainable Agriculture (NMSA)**, which is one of the eight Missions under the **National Action Plan on Climate Change (NAPCC)**. NAPCC has identified the focus areas on Dryland agriculture, risk management, access to information and use of biotechnology under NMSA and are implemented in schemes of **Rainfed Area Development, On Farm Water Management, Soil Health Management and Climate Change and Sustainable Agriculture: Monitoring, Modelling and Networking**.

There is no proposal for creation of National Agriculture Disaster Management scheme to tackle the issues of sudden climatic changes and other issues which are becoming more frequent. However, every **Ministry/Department is mandated to prepare a Disaster Management plan under Sections 36/37 of Disaster Management (DM) Act, 2005**. Accordingly, Department of Agriculture and Farmers Welfare has prepared a National Agriculture Disaster Management Plan (NADMP) to include key aspects of Disaster Risk Reduction (DRR) that address climate change adaptation and sustainable development goals related to the agriculture sector.

43. Cuertlaxochitl:

The story of America's Christmas Eve shrub has lessons for free trade, and patents

Context: *Poinsettia* can be an example of **intellectual property rights** or **biopiracy**; it depends on whose interests one wants to nourish and protect: the breeder's or the cultivator'

Poinsettia:

- The **shrub**, known for its showy red bracts or modified leaves, is **native to Mexico** and was used by the **Aztecs** for dyeing their garments and as an **antipyretic medicine**.
- **Named** after the Mexican Botanist and first ambassador to USA **Joel Poinsett**.

International Union for the Protection of New Varieties of Plants or UPOV:

- A treaty was created outside the UN to provide a regulatory system for protecting plants.
- It was **first passed in 1961**, the treaty has been **revised thrice**, the last being in **1991** when the most stringent regulations were added.
- Members joining **UPOV** have to enact a compatible national law.
- So far, just **76 members** have signed and many of these did so because of pressure when signing bilateral trade agreements with the EU, US, Japan and the European Free Trade Association.
- **India has refused to join UPOV** since it denies farmers any rights, such as the freedom to reuse farm-saved seeds and to exchange them with their neighbours.
- India enacted its own **Protection of Plant Varieties and Farmers Rights Act of 2001 (PPV&FRA)**, which balances the interests of both while encouraging innovation in new varieties.

44. Why Antarctica's emperor penguins could be extinct by 2100

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

Threats to Antarctic biodiversity:

- Antarctica's land-based species have adapted to survive the coldest, windiest, highest, and driest continent on Earth.
- The species includes **two flowering plants, hardy moss and lichens**, numerous microbes, tough invertebrates and hundreds of thousands of breeding seabirds, including the **emperor and Adélie penguins**.
- Antarctica helps **regulate the global climate** by driving atmospheric circulation and ocean currents and absorbing heat and carbon dioxide. Antarctica even drives weather patterns in Australia.

Climate change impact on Antarctica:

- Antarctica's ice-free areas are predicted to expand, rapidly changing the habitat available for wildlife.
- As extreme weather events such as heat waves become more frequent, Antarctica's plants and animals are expected to suffer.
- **Nematode worm *Scottinema lindsayae***: The species lives in extremely dry soils, and is at risk as warming and ice-melt increases soil moisture.
- **Some may benefit initially**. These include the **two Antarctic plants, some mosses** and the **gentoo penguin**.
 - These species may increase their populations and become more widely distributed in the event of more liquid water (as opposed to ice), more ice-free land and warmer temperatures.

What to do?

• **Strategies include:**

1. "Influence external policy" strategy
 2. "Managing non-native species and disease"
 3. "Managing and protecting species".
- These strategies include measures such as granting special protections to species and increasing biosecurity to prevent the introduction of non-native species.

Emperor penguin:

- It is the **largest member of the penguin order** (Sphenisciformes). It is also the tallest and heaviest of all living penguin species.
- **Geographical Presence:** Endemic to Antarctica
- **IUCN Status:** Near threatened.
- The emperor penguin relies on ice for breeding and is the most vulnerable of Antarctica's species.
- The emperor penguin is at risk of extinction by 2100.

Moss:

- Mosses are **common flowerless plants** found in all regions, especially in damp (humid) or shady locations.
- It generally **absorbs water and nutrients from their immediate environments**, so it can reflect changes to ecosystems.
- So, it can be used as a **potential bioindicator** to monitor urban pollution and to measure the impact of atmospheric change.
- As a **bioindicator**, mosses respond to pollution or drought stress by changing their shape, and density or disappearing.
- This characteristic will allow scientists to calculate atmospheric alterations and air pollution.
- Drought stress tends to occur in mosses found in areas with high levels of nitrogen pollution, which has a negative impact on health and biodiversity.

45. Polar bears in key Canada region dying: Causes, effects

Context: Polar bears in Canada's Western Hudson Bay, an inland sea connected to the Arctic Ocean, are **dying at a fast rate**, according to a new government survey. It also revealed that **females and younger polar bears** are the worst affected.

Details of the survey:

- The population has declined from **842 in 2016** to **618 in 2021** in **Western Hudson Bay** — the region includes **Churchill**, the town that is known as '**the Polar Bear Capital of the World**'.
- **Western Hudson Bay** has witnessed a **drop of around 50%** in the population of polar bears since the **1980s**.

Significance of polar bears:

- **Polar bears** are one of the most significant predators in the Arctic region and they keep biological populations in balance.
- The big kills made by them serve as a food resource for scavengers like **Arctic foxes** and **Arctic birds**.
- If polar bears aren't able to hunt animals like seals, it can severely impact the food chain and the health of the ecosystem.

Impact of climate change on polar bears:

- Due to climate change led to ice melting, they are not able to hunt seals, their chief food, which may lead to a rise in the population of seals, which may threaten the existence of crustaceans.

46. 'Floating' solar farms on Delhi's water bodies, the first one at Bawana lake

Context: After rooftop panels, the Delhi government has come up with a new proposal to generate electricity through solar energy by installing 'floating solar farms' in lakes, water bodies and ponds across the city.

About the project:

- The project has been started in Outer Delhi's **Bawana lake**.
- A proposal has been made to install floating solar panels on water bodies such as on the Yamuna at Wazirabad and several ponds and lakes.
- The Bawana power plant has a 1,500-1,600 MW capacity.
- Floating solar panels are cheaper and more efficient than rooftop ones.

What are Floating Solar Panels?

- These are **Photovoltaic (PV) modules** mounted on platforms that float on water reservoirs, lakes, and where conditions are right seas and oceans.
- These platforms are typically moored on calmer bodies of water, such as ponds, lakes or reservoirs.
- These installations are relatively quick to construct, silent to run and require no land levelling or removal of vegetation.
- The **100 MW Ramagundam floating solar PV** project in **Telangana**, is the largest floating solar power plant in India.

What are the Environment Benefits of the Project?

- The most obvious advantage is the **minimum land requirement** mostly for associated evacuation arrangements.

- Further, with the presence of floating solar panels, the **evaporation rate from water bodies is reduced**, thus helping in water conservation.
- Approximately 32.5 lakh cubic meters per year of water evaporation can be avoided.
- Efficient in **Reducing Co2 Emission**.

47. Why India refused to sign Methane Pledge?

Context:

- A few days back, the government gave a detailed explanation to the Parliament why it refused to sign the methane pledge. It said that fundamentally methane emissions are 'survival' emissions and not 'luxury' emissions, as in the case of the West.
- This pledge has the potential to affect India's trade and economic prospects.
- The government also pointed out that agriculture was not included in the emission intensity target as per India's pre-2020 voluntary commitments.
- This pledge shifts the CO2 reduction burden to methane reduction, which has a lifetime of just 12 years.

About Global Methane Pledge

- The Global Methane Pledge was launched at **COP (Conference of Parties) 26** in November 2021 to catalyse action to reduce methane emissions.
- It was led by the United States and the European Union.
- It has 111 country participants who together are responsible for 45% of global human-caused methane emissions.
- **India, which is not a part of the Global Methane Pledge**, is among the top five methane emitters globally.
- Most emissions **can be traced back to agriculture**.
- By joining the Pledge, countries commit to work together in order to **collectively reduce methane emissions by at least 30% below 2020 levels by 2030**.

Concern:

- Methane has contributed to about one-third of the current anthropogenic greenhouse gas-driven warming.
- Methane enters the atmosphere due to leaks in oil and gas industries, rearing livestock and the decomposition of waste in landfills.
- Currently, only 2 % of global climate finance goes to methane.
- If the Global Methane Pledge is not adhered to, Methane emissions will likely increase by 13 % by 2030.

About NICRA:

- **National Innovations in Climate Resilient Agriculture (NICRA)** is a network project of the Indian Council of Agricultural Research (ICAR) launched in February 2011.
- Aim: The project aims to enhance the resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstration.
- The research on adaptation and mitigation covers crops, livestock, fisheries and natural resource management.
- **Objectives of NICRA:**
- To enhance the resilience of Indian agriculture covering crops, livestock and fisheries to climatic variability and climate change through the development and application of improved production and risk management technologies.
- To demonstrate site specific technology packages on farmers' fields for adapting to current climate risks
- To enhance the capacity building of scientists and other stakeholders in climate resilient agricultural research and its application.
- **Components:** The Project is composed of Four Components:
- Strategic research on adaptation and mitigation
- Technology demonstration on farmers' fields to cope with current climate variability
- Sponsored and competitive research grants to fill critical research gaps
- Capacity building of different stakeholders.

48. Red seaweed promises a green alternative to plastic

Context: National Institute of Ocean Technology (NIOT), Chennai, holds out hope that **biopolymers** from **red seaweed** (Kappaphycus alvarezii) incorporated with **nanoparticles** could substitute plastic in certain applications.

Details:

- The whole seaweed **Kappaphycus alvarezii** (containing **carrageenan**) was used in preparing the **bio-nanocomposite film** by blending with **metal oxide nanoparticles** such as **zinc oxide**, **cupric oxide** and **silicon dioxide**. Then its properties were compared with standard refined commercial-grade carrageenan.

Red seaweed or Kappaphycus alvarezii:

- **Kappaphycus alvarezii**, the **elkhorn sea moss**, is a species of red algae.

- The elkhorn sea moss varies in size, weight, and age.
- It is a **dark greenish-brown hue** and can sometimes be **deep purple**.

Carrageenans:

- Also called **carrageenins** are a family of **natural linear sulfated polysaccharides** that are **extracted from red edible seaweeds**.
- Carrageenans are **widely used in the food industry**, for their **gelling, thickening, and stabilizing properties**.
- Their main application is in dairy and meat products, due to their strong binding to food proteins.
- In recent years, carrageenans have emerged as a promising candidate in **tissue engineering** and **regenerative medicine applications** as they resemble native **glycosaminoglycans (GAGs)**.
- They have been mainly used for **tissue engineering, wound coverage and drug delivery**.

What are Biopolymers?

- **Biopolymers** are **natural polymers** produced by the **cells of living organisms**.
- Like other polymers, biopolymers consist of monomeric units that are covalently bonded in chains to form larger molecules.
- **Biopolymers** derived from any **plant-based biomass** are **renewable, biodegradable, and eco-friendly**.

Types of Biopolymers:

- Biopolymers can be classified according to various scales. These classifications are based on their origin, the number of monomeric units, on the basis of degradability, heat response etc. Some of the classifications are:

On the Basis of Type:

1. **Sugar-based polymers:** Starch or sucrose is used as input for manufacturing. Lactic acid polymers are created using lactose from potatoes, maize, etc
2. **Starch-based polymers:** Starch acts as a natural polymer, composed of glucose. It is found in plant tissues.
3. **Cellulose-based biopolymers:** Used for packaging, this polymer is made up of glucose obtained from natural sources like cotton. Eg. cellophane.
4. **Synthetic materials:** Degradable polymers can be made from synthetic materials obtained from petroleum.

On the Basis of Origin:

1. **Natural biopolymers:** These are natural biopolymers biosynthesised by living organisms.
2. **Synthetic biopolymers:** These are polymers made up of renewable materials like polylactic acid which are degradable.
3. **Microbial:** Biopolymers produced by microorganisms.

On the Basis of Monomeric Units:

1. **Polysaccharides:** These are **carbohydrate chains** which are branched or linear: Eg. starch, cellulose, etc.
2. **Proteins:** Polymers made up of **amino acids**. Eg. collagen, fibrin etc.
3. **Polynucleotides:** Nucleic acids are long polymer chains composed of 13 or more monomeric units. Eg. **DNA, RNA** etc.

Examples of Biopolymers:

- These include **natural rubbers** (polymers of isoprene), **suberin and lignin** (complex polyphenolic polymers), **cutin and cutan** (complex polymers of long-chain fatty acids) and **melanin**.

Usage of Biopolymers:

- Biopolymers have applications in many fields including the **food industry, manufacturing, packaging, and biomedical engineering**.
- These include bioplastic films for packaging, biomedical scaffolds/grafts, 3D printing ink, controlled drug delivery, biosensor, and microbial fuel cell for electric vehicles.
- **Polysaccharide** extracts from seaweed — **carrageenan biopolymers** — are already used by the food industry. But such extraction uses solvents and chemicals, which also generate waste.

49. Water-biodiesel cocktail cuts greenhouse gas emissions

Context: Using **biodiesel** to run truck engines can help **reduce automotive greenhouse gas emissions**, but the problem is that **biodiesel releases more nitrogen oxide emissions than fossil diesel does**. It further has a **lower calorific value**, which means you need more of it in your tank.

‘Micro-explosion’ phenomenon:

- Scientists say **mixing water with biodiesel** addresses these problems.
- Early vaporisation of water inside the fuel droplet increases its temperature, thus resulting in a phenomenon called **‘micro-explosion’**, which in turn results in **small fuel fragments**, thus **improving air-fuel mixing** and **reducing soot formation**.
- One gets better engine performance, lower emissions and less soot.

Concerns in mixing water with biodiesel:

- The water and Biodiesel cannot mix together.
- But the problem can be **solved with the help of an emulsifier**, which is usually one of the chemicals that are called **surfactants**.
- Usually, a mixture of surfactants called **Span80** and **Tween80** is used for this purpose.
- But **Span80-Tween80** is for **diesel** and needs a different concoction for biodiesel.
- The stability of the emulsifier is critical because one can't afford to have water separate from the oil, which would bring its own problems such as **corrosion**.

Solution:

- A cocktail of **Span80-Tween80** and two novel surfactants, **polyglycerol poly ricinoleate (PGPR)** and **raw Karanja oil (RKO)**.
 - **PGPR** is a commercially available low-cost food ingredient. **RKO** is a tree product. The novel surfactant is, therefore, a viable one.
- The **challenge is to find the optimum mix of water and biodiesel**, with the surfactant thrown in.
- More water means **reduced tailpipe emissions**, but also lower heat content of the fuel.
- Researchers found that the **optimum water concentration is 18 per cent**, which **reduced nitrogen oxide by 40 per cent, smoke by 52 per cent and carbon monoxide by 69 per cent**.

Karanja tree (Pongamia pinnata):

- **Pongamia pinnata** — better known in the subcontinent by names like **Indian beech, karum tree, mullikulam tree, pongam and pongam oil tree** — has attracted the attention of global investors and companies that have committed to net-zero emissions.
- Pongamia pinnata has multiple applications: From **land remediation and carbon sequestration to socioeconomic benefits** like **afforestation**.
- The seeds are a good source of (non-edible) **oil**. Pongamia seeds give out an oil that is **yellowish-orange to brown** and can be used to **produce biodiesel** through **trans-esterification**.

50. India is all set to go for its first waste-to-hydrogen project

In the news: Pune Municipal Corporation (PMC) has partnered with business enterprise **The Green Billions (TGBL)** to manage its waste and generate it into useable **green hydrogen**. TGBL's special purpose vehicle or subsidiary, **Variate Pune Waste to Energy Private Ltd**, will be undertaking the work.

India's first waste-to-hydrogen project:

- The new facility for generating hydrogen from waste will **solve two major problems**:
 - Inefficient waste management and
 - carbon emissions.
- **Variate Pune Waste to Energy Private Ltd** will be managing and utilising the municipal waste of **350 tonnes per day (TPD)** for **generating hydrogen for 30 years**.
- This waste will comprise **biodegradable, non-biodegradable and domestic hazardous waste**.
- The hydrogen generated at the facility will be utilised locally to help the city lower its emissions.
- With this project, **Pune city can reduce up to 2.5 million tonnes carbon dioxide equivalent**, over 3.8 million tonnes of waste would be diverted from the landfill/dumping site and more than 180,000 estimated households will be served directly.

The technology used in the plant:

- **Optical sensor technology** will be used for the purpose.
- The **Refuse-Derived Fuel (RDF)** from the waste would later be utilised to generate hydrogen using **plasma gasification technology**.
- The technology has been developed while closely working with the **Bhabha Atomic Research Institute (BARC)** and the **Indian Institute of Science, Bengaluru**.
- It is estimated that **150TPD RDF and 9MT tonnes of H₂** would be generated out of **350 TPD waste**.

Benefits of the waste-to-hydrogen plant:

- Production of green energy sources
- Efficient and sustainable waste management
- Reduction in carbon footprint
- Step to fulfil India's climate goals
- Reduction in methane emissions with the reduction in landfill usage

Viability of Waste-to-hydrogen plants:

- Waste-to-Energy plants are viable only when the plant can process at least **300 TPD**.
- WTE plants should be set up in large cities with a **population above 2 million**.
- The project will manage **350TPD waste for Pune**, which has a population of more than **7 million**.

- **Mahatma Phule Renewable Energy & Infrastructure Technology (MAHAPREIT)**, a Maharashtra government undertaking, has proposed to **offtake the hydrogen generated at the facility** and develop **logistical infrastructure** for hydrogen transportation to industries for this.

51. Bengal green activist

Bengal green activist urges PM Modi to save country's oldest botanical garden from Ganga erosion

Context:

- The **Acharya Jagadish Chandra Bose Botanic Garden** in **Howrah** has been highly impacted on its eastern fringe due to erosion by the Ganga River.

About Acharya Jagadish Chandra Bose Botanic Garden:

- The Acharya Jagadish Chandra Bose Indian Botanic Garden, previously known as **Indian Botanic Garden** and the **Calcutta Botanic Garden**, is situated in **Shibpur, Howrah near Kolkata**.
- The gardens were founded in **1787** by **Colonel Robert Kyd**.
- It is under **Botanical Survey of India (BSI)** of **Ministry of Environment and Forests**, Government of India.
- It is **India's largest botanical garden**, and is spread over **270 acres**.
- The garden is **one of the best and oldest landscaped gardens in the world**, having more than **12,000 species**.
- The best-known landmark of the garden is **The Great Banyan**, an enormous **banyan tree (Ficus benghalensis)** that is reckoned to be the **largest tree in the world**, at more than **330 metres in circumference**.

Issue facing by the garden:

- The erosion by the Ganga may wash away parts of its fence and inner plantation soon.
- The **western side of the Ganga (Hooghly)** is highly susceptible owing to **massive soil erosion** and breaches of the embankment.
- The **Kolkata Port Authority**, after dredging disposes of it at a distance within the river. This leads to unevenness in the riverbed.
- River pollution due to untreated sewage from urban local bodies.

Sewage treatment projects:

- Multiple sewerage infrastructure projects in West Bengal worth over Rs 2,550 crore has been inaugurated.
- The list included **seven sewerage infrastructure projects** developed under the **National Mission for Clean Ganga (NMCG)**.

GOVERNMENT SCHEME

1. DigiYatra facial recognition software

Context: The government has introduced paperless entry at select airports to make air travel hassle-free. Under this initiative, airports will use a facial recognition software called 'DigiYatra' for entry.

Concept:

- To make air travel hassle-free airports will use a **facial recognition software called 'DigiYatra' for entry under digi Yatra initiative**
- It envisages that travelers pass through various checkpoints at the airport through paperless and contactless processing, using facial features to establish their identity, which would be linked to the boarding pass.

How it works?

- A passenger has to register their details on the DigiYatra app using Aadhaar-based validation and a self-image capture.
- At the airport e-gate, the passenger has to first scan the bar coded boarding pass and the facial recognition system installed at the e-gate will validate the passenger's identity and travel document.
- Once this process is done, the passenger will have to follow the normal procedure to clear security and board the aircraft.

Advantages:

- It makes flying more convenient and **reduces congestion** at airports.
- With this technology, the entry of passengers would be automatically processed based on the facial recognition system at all checkpoints – including entry into the airport, security check areas, aircraft boarding, etc.

Project implementation:

- The project is being implemented by the **Digi Yatra Foundation** — a joint-venture company whose shareholders are the Airports Authority of India (26% stake) and Bengaluru Airport, Delhi Airport, Hyderabad Airport, Mumbai Airport and Cochin International Airport hold the remaining 74% of the shares.
- In the **first phase**, the initiative will be launched at seven airports, starting with three — **Delhi, Bengaluru, and Varanasi**, followed by four airports namely Hyderabad, Kolkata, Pune, and Vijayawada by March 2023.

- The facial recognition system at various airports across the globe, including **Dubai, Singapore, Atlanta and Narita (Japan)**, have helped bring in efficiency.

2. Daakroom

Context: Under the aegis of Azadi Ka Amrit Mahotsav, Ministry of Culture in association with Department of Post unveiled Daakroom, the renowned letter writing carnival today at the Gandhi Darshan at Raj Ghat, New Delhi.

Concept:

- The one-of-a-kind letter writing event, supported by India Post, Ministry of Culture and Gandhi Smriti and Darshan Samiti is aimed to give a digital detox with the aim of reviving the art of letter writing in India.
- The unique carnival conceptualized to re-introduce children & larger audiences to letter writing in innovative, creative, and engaging ways, also hosted competitions and workshops around writing and post.
- It also included music, theatre, dance, stand-up comedy, shopping, food and interactive demos from the Postal Department, deploying fun ways to get people of all age groups excited about letter writing.

3. FSSAI's star ratings

News: FSSAI's star ratings for food products may mislead consumers: Experts say IIM-Ahmedabad study is flawed in 'design and interpretation'

Context:

- **The rating will be the first such in India**, a country burdened with lifestyle diseases, and is aimed at guiding consumers to opt for healthy food. The HSR format ranks a packaged food item based on salt, sugar, and fat content and the rating will be printed on the front of the package.
- **The FSSAI, a body under the ministry of health and family welfare (MoHFW)** had directed IIM-A to conduct a large-scale survey to analyse major FoP Labelling models that are available across the world and identify one which is easy to understand and can induce behaviour change among Indian consumers. In India, packaged food has had back-of-package (BOP) nutrient information in detail but no FoP Labelling, which, as global experience suggests, has the ability to nudge healthy consumption behaviour with respect to packaged food.
- **Following the report, the FSSAI** has sought feedback from industry associations for evaluation by a scientific panel so that the **HSR model can be included in the draft regulation formulated by the government.**
- **The food regulator has exempted milk and dairy products** from the proposed FoP Labelling, as they were in the earlier FSSAI draft notified in 2019. Also, the scientific panel has recommended voluntary implementation of FoP Labelling from 2023 and a transition period of four years for making it mandatory.

What are Health Star Ratings?

- **Food product packaging** is often confusing or distracting, particularly when there are so many different options available on supermarket shelves. This can make it hard to understand the nutritional value of products.
- **The Health Star Rating system** is a front of pack labelling system which helps you quickly and easily compare the nutrition of similar products that you typically see in the same part of the shop. The system provides a rating from a half to five stars – the more stars, the healthier the choice. When looking for the stars, remember that they are meant to provide a comparison within similar product categories only. For example, the system helps choose between one breakfast cereal and another, not between yoghurt and pasta sauce.



Front-of-Pack (FoP) Labelling System

- **FoP labelling system** has long been listed as one of the **global best practices to nudge consumers into healthy food choices.**
- In India, FoP labelling on packaged foods was recommended in 2014 by an expert committee constituted by the **Food Safety and Standards Authority of India (FSSAI)**. However, the country has not moved ahead on it towards bringing in a law. In 2019, **Centre for Science and Environment (CSE)** had brought the spotlight on this concern by highlighting the fact that most of such junk foods would be **labelled 'red' as per the draft FSSAI law.**
- CSE also pointed towards the delays and dilutions in bringing forth the legislation, because of opposition from the powerful packaged food industry. The industry's pressure tactics continue till date.

- Over the last year, the apex food regulator has been brainstorming with experts to **launch FoPL in India**. A petition seeking direction to the government to frame guidelines on HSR and impact assessment for food items and beverages was filed in the Supreme Court in June last year
- At present, **countries such as the UK, Chile, Mexico, New Zealand, and Australia have FoPL.**

Key points about Health Star Ratings:

- **Packaged foods** will have a number of stars displayed on them which will indicate whether the item is healthy or unhealthy. This **‘health start’** display on the package will help customers ascertain whether the **packaged food is harmful or healthy.**
- The star rating will be determined by the amount of fats, sugar, and salt in the food item.
- The system will be similar to the one that is being used by the Bureau of Energy Efficiency for assessing the energy efficiency in electrical devices.
- The ratings will be placed in front of the packets as studies show that this method is much more effective towards affecting the choice of the consumer.

Why FSSAI want to adopt Health Start Rating?

- This move follows a report by the **Indian Institute of Management Ahmedabad (IIM-A)** on the impact of front-of-the-pack labelling for packaged and processed foods. The study endorsed the **HSR format** as the best suited to Indians in helping to choose healthier packaged food items under a new policy on **Front of Packaging Labelling (FoPL).**
- **IIM-A has recommended HSR** as the most preferred format by Indian consumers under proposed FoPL in India. This national survey by **IIM-A** is the voice of more than 20,000 people across the country and none of the countries in the world has surveyed people at such a large scale. FoPL will bring a transformational reform in the society as it will encourage healthy eating. It will also help to reduce the burden of **Non- Communicable Diseases (NCDs)** in the country.

Argument against:

- The move has upset public health experts who favour the warning label system such as a black-and-white stop symbol used in Chile or the red warning symbol in Israel for each of the three ingredients — salt, sugar and fat.
- “Warning signs educate consumers about harmful ingredients present in a food product and help them make healthy choices. They also give a repetitive educational message so that even for domestic cooking or buying street food the warning bell goes off.
- This educational component of a properly constructed warning system is missing in the health star[s] system, which are like a movie rating system and are of no use.
- According to the expert the system being proposed by the food regulator was “devious” as it misleads consumers about a product’s nutrition profile.
- Under the health star rating system, an algorithm assigns a product a certain number of stars based on “positive” components (fibre, protein, and fruit, vegetable, nut and legume content) balanced against other components (energy, sugars, sodium, and saturated fat).
- Experts argue that this is divorced from science as the presence of high quantities of sugar can’t be offset by the so-called positive ingredients.

Conclusion:

- The system is **not intended to replace general dietary advice**, such as that provided by the **FSSAI Guidelines**, which recommend eating a balanced diet that includes a variety of nutritious foods every day.
- A high star rating doesn’t necessarily mean the product provides for a complete, balanced diet and should replace items from other core food groups or be eaten to excess.
- In addition, many healthy foods, like fresh fruit and vegetables and lean meats, are not generally packaged and will not display or will have a **Health Star Rating. Fresh fruit and vegetables are now eligible to display a 5-star health rating.**
- Instead of increasing packaging, food retailers are encouraged to use posters, shelf wobblers or other means to display the Health Star Rating

4. Scheme for Providing Education to Madrasas/ Minorities (SPEMM)

- The Parliamentary Standing Committee on Social Justice and Empowerment recently pulled up the Union government for the delay in approving the continuation of the **Scheme for Providing Education to Madrasas/Minorities (SPEMM)**, which provides for financial assistance to madrasas and minority institutes.

About Scheme for Providing Education to Madrasas/ Minorities (SPEMM):

- The scheme has two sub-schemes –
- the Scheme for Providing Quality Education in Madrasas (**SPQEM**) and
- Infrastructure Development of Minority Institutes (**IDMI**).

- The scheme is being **implemented at the national level**.
- Both the schemes **are voluntary in nature**.

Implementation:

- Department of School Education and Literacy is implementing the Umbrella Scheme for Providing Quality Education to Madrasas/Minorities (SPEMM).
- The scheme was transferred from the Ministry of Minority Affairs to the Ministry of Education in 2021.

Scheme for Providing Quality Education in Madrasas (SPQEM):

- To provide **financial assistance to traditional institutions like Madrasas and Maktabas** to encourage them to introduce Science, Mathematics, Social Studies, Hindi and English in their curriculum so that academic proficiency for classes I-XII is attainable for children studying in these institutions.
- To **strengthen State Madrasa Boards** opting for assistance by enabling them to monitor the Madrasa modernization programme and enhance awareness about education among the Muslim community.
- To provide quality components in Madrasas such as remedial teaching, assessment and enhancement of learning outcomes, Rashtriya Avishkar Abhiyan etc.
- To provide in-service training of teachers appointed under the scheme for teaching modern subjects of Science, Mathematics, Social Studies, Hindi and English to improve their pedagogical skills and quality of teaching.

Infrastructure Development of Minority Institutes (IDMI):

- Infrastructure Development of Minority Institutes (IDMI) has been operationalised to **augment Infrastructure in Private Aided/Unaided Minority Schools/Institutions** in order to enhance the quality of education to minority children.
- **The salient features of IDMI scheme are:**
- To facilitate education of minorities by augmenting and strengthening school infrastructure in Minority Institutions (elementary/ secondary/senior secondary schools) in order to expand the facilities for formal education to children of minority communities.
- To encourage educational facilities for girls, children with special needs and those who are most deprived educationally amongst the minorities.

5. New India Literacy Programme

- Government has announced a **Centrally Sponsored Scheme** namely, “New India Literacy Programme” (NILP) for implementation during five years from 2022-23 to 2026-27.
- The programme aims to cover a target of 5.00 crore learners during the five years under Foundational Literacy and Numeracy component.
- The programme has five objectives: (i) Foundational Literacy and Numeracy, (ii) Critical Life Skills, (iii) Vocational Skills Development, (iv) Basic Education and (v) Continuing Education.
- while implementing the NILP should be opening and mapping of all Bank Accounts of Single Nodal Agencies (SNAs) and Implementing Agencies (IAs) in all States with Public Financial Management System (PFMS). This is a pre-requisite for release of funds as per revised procedure guidelines of Ministry of Finance.
- The total financial outlay of NILP for five years (FYs 2022-23 to 2026-27) is Rs.1037.90 crore, out of which Rs.700 crore is Central share and Rs.337.90 crore is State share.
- The Central and State shares are in the ratio of 60:40 for all States other than North Eastern Region (NER) and Himalayan States where the sharing pattern between the Centre and the State is in the ratio of 90:10.
- For UTs with legislature the ratio is 60:40, except in the UT of Jammu & Kashmir where the ratio is 90:10, and for all other UTs without legislature the Central share is 100%. The fund flow is through PFMS and State treasuries.

6. Panel to study UGC’s IKS faculty training guidelines

- The Kerala State Higher Education Council (KSHEC) has constituted a committee to formulate an expert opinion on the University Grants Commission (UGC)’s draft guidelines for faculty training on Indian Knowledge System (IKS).

About the news

- University and college faculty will now have to attend mandatory training on Indian Knowledge Systems (IKS), according to the University Grants Commission (UGC) draft guidelines.
- The UGC guideline for **faculty training on IKS** has been issued to facilitate a seamless integration of traditional knowledge with modern subjects.
- The faculty training will include **topics on Dharmashastras, Shukraniti, Mahabharata, and Arthashastra and Chemistry** in practice as gleaned from the medical schools of ancient India.
- The IKS guidelines will be a part of the training modules under “**Malviya Mission**” and will be considered under Career Advancement Scheme (CAS) scheme as per the UGC regulations.

About Malviya Mission

- The Union Minister of Education launched “Malviya Mission” to develop an environment for teacher education/faculty development across the country.
- It addresses the need to adopt a multidisciplinary approach in teacher education with a special focus on Indian values, languages, knowledge, ethos, and traditions.
- It focuses on teacher education to achieve the targets mentioned in the ‘National Education Policy 2020’.

Indian Knowledge System (IKS)

- Indian Knowledge System (IKS) is an **innovative cell under Ministry of Education (MoE)** at AICTE, New Delhi.
- It is established **to promote interdisciplinary research on all aspects of IKS**, preserve and disseminate IKS for further research and societal applications.
- It will actively engage for spreading the rich heritage of our country and traditional knowledge in the field of Arts and literature, Agriculture, Basic Sciences, Engineering & Technology, Architecture, Management, Economics, etc.

Functions of IKS division:

- Facilitate and coordinate IKS based/related inter and transdisciplinary work done by various institutions in India and abroad including universities, institutions of national importance, R&D laboratories and different ministries and inspire private sector organizations to engage with it.
- Establish, guide and monitor subject-wise interdisciplinary research groups comprising of researchers from institutes, centers and individuals.
- Create and promote popularization schemes.
- Facilitate funding of various projects and develop mechanisms to undertake research.
- Make Policy recommendations wherever required for the promotion of IKS.

7. Project Vaani

Context: Project Vaani scales decibels as it maps language landscape of India.

About Project Vaani:

- **Indian Institute of Sciences (IISc), ARTPARK (AI and Robotics Technology Park) and Google** have come together for mapping the language diversity of India.
- Aim is to create data corpora of over 150,000 hours of speech, part of which will be transcribed in local scripts.
- The Project diligently collects and curates’ datasets of natural speech and text from about 1 million people across all 773 districts of India will be open-sourced.
- Open source is done through platforms like Bhashini (under the National Language Translation Mission, MeiTY).
- Funding is done by **Google**.
- Greater objective is to boost the development of technologies such as automatic speech recognition (ASR), speech to speech translation (SST), and natural language understanding (NLU) that reflect the ground realities of how Indians speak.



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Marks Obtained	
Paper I	144.66
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REMARKS : QUALIFIED FOR CS(MAIN) EXAMINATION,2016

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MONTHLY CURRENT AFFAIRS TEST - 15

ENTIRE YEAR IMP QUESTION TEST (SUBJECT-WISE) - 8

FULL LENGTH STIMULATED TEST - 10

C-SAT Test - 10

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