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Why in news?

- Ottanthullal a traditional art form of Kerala that has a history of over 300 years.

About Ottanthullal

- Ottanthullal (or Thullal, in short) is a recite-and-dance art-form of Kerala that is famous for its humour and social satire, and marked by its simplicity as opposed to more complex dance-forms like Kathakali and Koodiyattam.
- The word Thullal means "to jump" or "leap about" in the Malayalam language.
- It was introduced in the eighteenth century by Kunchan Nambiar, one of the Prachina Kavithrayam (three famous Malayalam-language poets).
- There are three varieties of this dance form namely, Ottanthullal, Seethankan and Parayan Thullal, but Ottanthullal dominates out of these.
- The folksy performance, often laced with humour intended at criticism of society, is accompanied by a mridangam and/or the handy idakka besides a pair of ilathalam cymbals.
- Like most Indian performing art forms, Ottanthullal has its principles influenced by the Natya Shastra.
- In Ottanthullal, a solo performer, with green makeup and a colourful costume (decorated with a long red and white band and painted wooden ornaments), acts and dances while reciting dance (Thullal) (lyrics).
- A chorus or one or more artists repeats each sentence as it is completed.

161st birth anniversary of Swami Vivekananda

History

Why in news?

- January 12, 2023 marked the 161st birth anniversary of Swami Vivekananda, observed as National Youth Day.

About Swami Vivekananda

- He was **born Narendranath Datta on January 12, 1863, in Kolkata, West Bengal.**
- He practiced meditation from a very early age and also joined the Brahmo Samaj movement for a certain period.
- He later became the **most-notable disciple of Ramakrishna**, who demonstrated the essential unity of all religions.
- He **believed in the essential unity of man and god (Advaita).**
- He believed that it was only in selflessness and in consciously trying to serve the larger humanity that one truly gained a perspective on religion and God.
- He stressed on the universal and humanistic side of the Vedas as well as belief in service rather than dogma.
- He was a Hindu spiritual leader and reformer who attempted to combine Indian spirituality with Western material progress, maintaining that the two supplemented and complemented one another.
- One of the greatest patriots, he was also credited for **introducing Indian philosophies of Vedanta and Yoga to the western world.**
- He was one of the main representatives of Neo-Vedanta, a modern interpretation of selected aspects of Hinduism in line with western esoteric traditions, especially Transcendentalism, New Thought and Theosophy.
- He is best known in the United States for his groundbreaking speech to the 1893 (11th September) World's Parliament of Religions at Chicago** (This day is observed as "World Brotherhood Day").
- On his return to India with a small group of Western disciples in 1897, Vivekananda founded the Ramakrishna Mission at the monastery of Belur Math on the Ganga River near Calcutta (now Kolkata).
- He died on 4th July 1902 and was cremated on a sandalwood funeral pyre on the bank of the Ganga in Belur,** opposite where Ramakrishna was cremated sixteen years earlier.
- In 1985, the Government of India declared his birthday – January 12, as National Youth Day.**



Why in news?

- Archeological Survey of India (ASI) has discovered two 1200-year-old miniature votive stupas recently.

About miniature votive stupas

- They were discovered during landscaping activities near Sarai Tila mound on the premises of 'Nalanda Mahavihara', a world heritage site in Nalanda district.
- The stupas (offered in fulfilment of a vow), carved from stone, depict Buddha figures.
- Beginning in the 7th century CE in India, small miniature terracotta stupas became popular as votive offerings.

About the Nalanda Mahavihara

- The Nalanda Mahavihara site comprises the archaeological remains of a monastic and scholastic institution dating from the 3rd century BCE to the 13th century CE.
- It includes stupas, shrines, viharas (residential and educational buildings) and important art works in stucco, stone and metal.
- Nalanda stands out as the most ancient university of the Indian subcontinent. It engaged in the organized transmission of knowledge over an uninterrupted period of 800 years.
- It presents key archaeological evidence of a truly international centre for organised learning.
- Nalanda Mahavihara was founded by Kumargupta I of the Gupta dynasty in 5th century CE.**
- It was **patronized by various rulers including King Harshavardhana of Kannauj (7th century CE) and the Pala rulers (8th – 12th century CE)** as well as various scholars.
- Later, number of factors spread over centuries caused the decline of this famed institution.
- The same region, later, saw emergence of a number of reputed educational institutions like Vikramshila and Odantpuri but the eminence of Nalanda remains unrivaled.
- About six centuries after Nalanda's decline, the site was **first discovered and reported by Sir Francis Buchanan.**
- The site was systematically excavated and consolidated by the Archaeological Survey of India from 1915 to 1937 and again from 1974 to 1982.
- Built ensembles in Nalanda are a physical manifestation of influence of ancient Indian pedagogy where planning, architecture and artistic traditions of Indian sub-continent and beyond developed into subsequent architectural and artistic prototypes.
- Nalanda distinguished itself as the earliest planned university of the Indian subcontinent.** Thematic and iconographic assimilation of features from major art-centres of the sub-continent with local practices is evident in art of Nalanda.
- While Nalanda stucco influenced practices in Thailand, its metal art influenced art of the Malayan archipelago, Nepal, Myanmar and Tibet travelling out through scholars.

Why in news ?

- Maghi Mela is held in the holy city of Sri Muktsar Sahib in Punjab every year in January, or in the month of Magh according to the Nanakshahi calendar.

About Maghi Mela

- Maghi Mela has been celebrated in the city of Sri Muktsar Sahib in Punjab for centuries in memory of 40 Sikh warriors who were killed fighting the Mughals in the Battle of Khidrana in 1705.
- It was after this battle that Khidrana was named Muktsar, or the pool of liberation.
- The story of the Battle of Khidrana goes like this: in 1704, during the siege of Anandpur Sahib by the Mughals, 40 Sikh soldiers deserted their posts and fled.
- Upon arriving at their village near Amritsar, a woman named Mai Bhago scolded them and rallied the fighters to return to Anandpur Sahib in the service of their Guru.
- The freshly motivated soldiers along with Mai Bhago set off towards Anandpur Sahib to help Guru Gobind Singh hold fort against the Mughals.

- They met the Guru at Khidrana where they took on a large Mughal army, sacrificing their lives in the process.
- Interestingly, the actual martyrdom day of 40 Sikh soldiers (Muktas) falls in the month of Vaisakh, approximately in the first week of May – Gurdwaras continue to pay tributes to the martyrs in that month.
- About a century ago, however, due to the scarcity of water in the region, the mela started being organised on the Sankrant of Magh month. This tradition has continued, giving the festival its present name.
- People from different parts of the state and even outside come to Muktsar take a holy dip in the sarovar (lake) of Gurdwara Darbar Sahib and enjoy the festivities.
- Back in the day, people would arrive in the city days before the actual Maghi day. In the evenings, there would be kavi darbars (poetry sessions) where politicians would speak
- This is likely how the political conferences, which can be traced back to the mid-1950s, started.
- Over time, the conferences were increasingly organised in the daytime, during the actual mela. Lengthy, overnight stays became less common due to changing lifestyles and priorities.

Assam's Charaideo Moidams Burial Sites

History

Why in news?

- Assam Chief Minister has recently announced that the central government has decided to put forth the name of Assam's Charaideo moidams burial sites for addition to UNESCO's World Heritage Sites list.

About Charaideo moidams burial sites-

- **The Charaideo moidams are royal burial sites of the Ahom dynasty**, which ruled over much of Assam and the North East from 1228 to 1826 AD.
- **A moidam is a tumulus – a mound of earth raised over a grave** – of Ahom royalty and aristocracy.
- While Charaideo exclusively contains moidams of Ahom royals, other moidams of aristocrats and chiefs can be found scattered across Eastern Assam, in the region between the towns of Jorhat and Dibrugarh.
- **A typical moidam at Charaideo contains one or more chambers in a vault and on top of these is a hemispherical earthen mound, rising high above the ground, covered in grass.**
- On top of this mound, there is a **pavilion, known as the chow chali**.
- A low octagonal wall surrounds the mound with one entrance.
- **Unlike Hindus who cremate their dead, the predominant funerary method of the Ahoms, originating from the Tai people, was the burial.**
- The height of a moidam is typically indicative of the power and stature of the person buried inside.
- However, except for those of Gadhadhar Singha and Rudra Singha, most moidams remain unidentified.
- **Inside the chambers of the moidam, the dead king would be buried along with items he needed for the "afterlife", as well as servants, horses, livestock and even their wives.**
- It is the **similarity of the Ahom burial rites with that of the ancient Egyptians** that give Charaideo moidams the moniker of **"Pyramids of Assam."**

Significance of Charaideo-

- The word Charaideo has been derived from three Tai Ahom words, Che-Rai-Doi.
- In short, Charaideo means, "a shining town situated on a hilltop."
- While the Ahoms shifted capitals multiple times over their 600-year history, Charaideo is considered to be their first capital city established in 1253 AD by king Sukaphaa.
- After Sukaphaa was laid to rest in Charaideo in 1856, subsequent royals also chose it as their own resting place.

Buddhist Monastery complex discovered at Bharatpur of Bengal

History

Why in news?

- A Buddhist monastery was found during recent excavations at Bharatpur in the Paschim Bardhaman district of West Bengal.

About the site-

- **The site was initially excavated almost fifty years ago between 1972 and 1975** when archeologists from ASI and from Burdwan University found a Buddhist stupa at the site.



- The site lay unexcavated for almost fifty years.
- According to experts, **what makes the site unique in terms of Buddhist sites in the State is the presence of a large stupa along with a monastery complex and black and red ware pottery** from the Chalcolithic or Copper Age.
- So far, they have exposed some **structures which appear to be the outer wall of the monastery**,
- containing **nine layers of brick and a small circular structure**, probably a stupa.
- In other sites across West Bengal, such as Karnasubarna in Murshidabad, Moghalmari in Paschim Medinipur and Jagjivanpur in Malda, archeologists have found only smaller votive stupas.
- **A Buddhist stupa is a commemorative monument** usually housing sacred relics associated with the Buddha or other saints or priests, whereas votive stupas have similar significance but are smaller structures originating in eight cylindrical structures.
- **The site was important for two main reasons: one, because it is an early village settlement on the bank of the river Damodar which could date to around 2000 BCE; and two, the Buddhist monastery complex.**
- Archaeologists said that the **site could have been a nucleus of an early village farming** site from where sites radiated to other areas along the other bank of the Damodar and **other rivers like Ajoy and Darakeshwar.**
- **In the 1970s when the site was excavated along with the stupa, five beautiful seated sculptures of the Buddha in Bhumisparsha Mudra** -- with all five fingers of the right hand extended to touch the ground, were found.

Padma Awards for Art 2023

History

Why in news?

- The Union ministry of home affairs announced the Padma Awards on the eve of the country's 74th Republic Day.

Some of the Padma Awards for Art-

- Following are some of the artists who have received Padma awards for 2023 and the art forms:

Ummathat ki Rani:

- Ummathat Folk Dancer from Kodagu, promoting & preserving Kodava culture through dance.
- Former President of Karnataka Kodava Sahitya Academy.
- The Kodava people or Kodavas are an ethno-linguistic group from the region of Kodagu in the southern Indian state of Karnataka, who natively speak the Kodava language. They are traditionally land-owning agriculturists and patrilineal, with martial customs.

K C Runremsangi-Queen of Mizo Folk:

- She is a Mizo Folk Singer from Aizwal, she has been safeguarding Mizo cultural heritage for over 3 decades.
- She had Received Sangeet Natak Akademi Award in 2017.

Risingbor Kurkalang-Master of Duitara:

- He is a tribal Duitara Instrument Maker & Musician from East Khasi Hills.
- He Popularized Khasi folk music & instruments (Saitar and Duitara) across the world.
- **About Duitara-**
 - Duitara is a 4-stringed Khasi-Jaintia musical instrument, crafted using jackfruit tree and Muga silk - making it a lucrative source of rural livelihood.
 - The term seems similar to the dotara instrument played in the neighboring states of Assam and West Bengal.
 - The duitara consists of strong hard wood, the hollow in the belly of its main body is coated with dried animal skin, and its neck has at its end four holes in which wooden pegs hold the strings in tune.

Mangala Kanti Roy-Sarinda Ke Sartaj:

- He is a 102 year old Sarinda Player from Jalpaiguri, popular as one of the oldest folk musicians of West Bengal.
- He is popular for producing unique bird calls through Sarinda.
- **About sarinda-**
 - A sarinda or saranda is a North Indian stringed folk musical instrument similar to lutes or fiddles. It is played with a bow and has between ten and thirty strings.
 - The bottom part of the front of its hollow wooden soundbox is covered with animal skin. It is played while sitting on the ground in a vertical orientation.



- The Sarangi and Nepali sarangi are similar to the Saranda.
- Several ethnic groups of India, e.g. Bauls of Bengal, Punjabi people, the folk artists of Rajasthan, Assam and Tripura, use the sarinda in their traditional music and dance.

Moa Subong-Tunes of Bamhum:

- He is an eminent Naga Musician & Innovator who developed a new and easy to play instrument 'Bamhum', a wind musical instrument made from bamboo.
- BamHum is **a medium sized bamboo instrument that works when the player hums into the hum hole**. Unlike the flute which works when air is blown into the opening, the BamHum works when the player hums any tune into the hum hole at its side.
- He founded Abiogenesis, a musical band that fuses traditional Naga music with modern rock music, along with his vocalist wife.
- He created a new music genre named Howey and another instrument called Tikzik.

Munivenkatappa-Thamateya Tande (Father of Thamata):

- He is a veteran Thamate exponent from Chikkaballapur, working tirelessly towards the preservation and promotion of the folk instrument Thamate.
- **About Thamate-**
 - Thamate is a percussion instrument (hand drum) from Old Mysore region of Karnataka.
 - Thamate, nagaari and thaarsi are percussion instruments played together in folk performance traditions in Karnataka.
 - They are made of leather and iron rings and produce qualitatively different yet complimentary sounds, making them a perfect combination for a band.

Domar Singh Kunvar-Natya Nach ke Nayak:

- Chhattisgarhi Natya Nacha Artist, dedicated his life to keeping the tradition alive since last 5 decades.
- Essays the role of Sultana Daku who fought against British imperialists – has performed plays in 13 dialects & languages.
- Through his plays, spreads awareness about eradicating superstition and social evils like child marriages.

Parshuram Komaji Khune- Zadhipatti ke Parshuram:

- He is a Zadipatti Rangbhumi artist from Gadchiroli.
- He worked for rehabilitation of misguided youth in LWE affected areas by engaging them in Folk culture.
- He spread awareness on social issues like Alcohol de-addiction, Hygiene, eradicating superstitions.
- **About Zadipatti-**
 - Zadipatti is a folk theatre performed during the harvest season of rice cultivation in Maharashtra.
 - Zadipatti is a folk theatre performed during the harvest season of rice cultivation in Maharashtra.
 - Zadipatti derives its name from the local name zadi for rice. It is practiced in the eastern region of Maharashtra, which includes Chandrapur Bhandar and Gadchiroli district of Vidarbha region.
 - The theatre art of this region is known as Zadipatti Rangbhumi.
 - Live music is a vital part of the form and the actors are singers as well. Although practised by various theatre groups these days, the region is inhabited by tribes like Gond, Korfu and Pardhi; and Zadipatti was born out of the tribal performing art called Dandar, which was a theatrical performance combining music and dance.

Ghulam Muhammad Zaz-Santoor ke Sartaaj:

- He is the 8th Generation Santoor Craftsman from a family known for making the finest Santoor in Kashmir for the last 200 years.
- He also made other stringed instruments like Rabab, Kashmiri Sitar and Sarangi.
- These instruments are known for their long lifespan, with many of them lasting for over a century.
- The Indian **santoor** instrument is a trapezoid-shaped hammered dulcimer, and a variation of the Iranian santur.
- The instrument is generally made of walnut and has 25 bridges. Each bridge has 4 strings, making for a total of 100 strings.
- It is a traditional instrument in Jammu and Kashmir, and dates back to ancient times. **It was called Shatha Tantri Veena in ancient Sanskrit texts.**



Bhanubhai Chitara-Kalamkari Chitara:

- He is 7th generation Kalamkari artist from the Chunara community, carrying forward the legacy of the 400 year old traditional craft of Mata ni Pachedi (behind Mother Goddess).
- Each painting has a story inspired by mythological epics such as Mahabharata & Ramayana.
- Kalamkari is **a type of hand-painted cotton textile produced in the Indian state of Andhra Pradesh**. Only natural dyes are used in Kalamkari, which involves twenty-three steps.
- There are two distinctive styles of Kalamkari art in India – Srikalahasti style and the Machilipatnam style.

Paresh Rathwa-Pithora na Paresh:

- Pithora Artist from Chhota Udepur, promoting the ancient cultural heritage.
- Pithora is a 12,000-year-old tribal folk art, created as divine offerings to Lord Pithora (God of food grains).
- **Pithora** is a ritualistic painting done on the walls by the Rathwa, Bhils and Bhilala tribes.
- The name Pithora also refers to the Hindu deity of marriage and functions commonly popular in Gujarat and Madhya Pradesh. The art form is carried forward through generations as a traditional occupation.
- **It is a wall painting that is mainly characterized by the seven horses.**
- It is believed that these seven horses represent the seven hills that surround the Gujarat-Madhya Pradesh border areas.

Kapil Dev Prasad-Bawan Buti ke Bunkar:

- He is a bawan Buti Handloom Weaver from Nalanda.
- It depicts Ancient Buddhist Symbols in his craft – through 52 butis in each woven item.
- Contributed in reviving & promoting the Bawan Buti Weave over 5 decades.

Hareka Religion

History

Why in news?

- Naga social worker Dr. Newme of Lodi Village of Dima Hasao district of Assam was awarded with Padma shri for preserving the Heraka religion for decades.

Heraka faith & Dr. Newme contributions-

- A native of Dima Hasao, Newme has acquired the title of Hero of Heraka by preserving and promoting the traditional culture of the Heraka people.
- Even the **Heraka religious text "Tingwang Hingde"** was transcribed by Newme.
- **Haipou Jadonang, a Naga spiritual guide and political activist from Manipur, British India, founded the Heraka religious organisation.**
- The veneration of the supreme god, "Tingkao Ragwang," was emphasised by the Heraka faith.
- Although this deity was accepted as the creator god in the old religion, he or she played a very minor role in daily life as one of many gods.

Etikoppaka Toys

History

Why in news?

- The Government of India has conferred Padma Shri upon C. V. Raju of Andhra Pradesh in the art category to honour the Etikoppaka wooden toy craft.

About Etikoppaka toys

The Etikoppaka toys are considered to be 'one with nature' since they are made purely out of natural elements such as seeds, lacquer, bark, roots and leaves.

- The wood derived to make these toys comes from the 'Ankudi Karra' tree (*Wrightia tinctoria*).
- In the early development stages of the Etikoppaka toys, they were only used by children as toys for the purpose of playing.
- Today, they can be used as toys, decoration items, utility items and even gifting items.
- Toy varieties include spinning tops, rattles, and animal figures.



- Etikoppaka boxes are also used for storing jewellery and sacred materials like vermillion.
- The artisans who engage in this craft have received several awards from forums like the National Innovation Foundation, UNESCO CCI Seal of Excellence for Handicrafts and so on.
- Moreover, these toys have also been displayed at various prestigious venues like the Rashtrapathi Bhawan.
- The Geographical Indication (GI) tag provided to these toys in 2017 has further contributed to their significance.

Mughal Gardens renamed as Amrit Udyan

History

Why in news?

- The iconic Mughal Gardens at the Rashtrapati Bhavan (President's House) in Delhi have been renamed as 'Amrit Udyan'.

A brief history Mughal Gardens in India-

- In Babur Nama, Babur says that his favourite kind of garden is the **Persian charbagh style** (literally, four gardens).
- The charbagh **structure was intended to create a representation of an earthly utopia – jannat** – in which humans co-exist in perfect harmony with all elements of nature.
- Defined by **its rectilinear layouts, divided in four equal sections**, these gardens can be found across lands previously ruled by the Mughals.
- From the gardens surrounding **Humayun's Tomb in Delhi to the Nishat Bagh in Srinagar, all are built in this style** – giving them the moniker of Mughal Gardens.
- **A defining feature of these gardens is the use of waterways**, often to demarcate the various quadrants of the garden.
- These were not only crucial to maintain the flora of the garden, they also were an important part of its aesthetic. **Fountains were often built**, symbolising the "cycle of life."

The gardens at the new Viceroy's house

- In 1911, the British decided to shift the Indian capital from Calcutta to Delhi.
- About **4,000 acres of land was acquired to construct the Viceroy's House with Sir Edwin Lutyens being given the task of designing the building on Raisina Hill.**
- Lutyens' designs combined elements of **classical European architecture with Indian styles**, producing a unique aesthetic that defines Lutyens' Delhi till date.
- Lady Hardinge, the wife of the then Viceroy, urged planners to create a Mughal-style garden as she was inspired by the **book Gardens of the Great Mughals (1913) by Constance Villiers-Stuart** as well as her visits to the Mughal gardens in Lahore and Srinagar.



National Green Hydrogen Mission

Environment

Why in news?

- The government has formally approved the National Green Hydrogen Mission with a stated aim of making India a global hub for the production of green hydrogen.

About the Mission

- It is aimed at the creation of export opportunities for green hydrogen and its derivatives; decarbonisation of the energy sector and use in mobility applications.
- The ultimate aim is to fuel key sectors of the economy using hydrogen that is made by splitting water through an electrical process called electrolysis, using a device called electrolyser that is powered entirely by renewable energy.
- India's Mission was first announced by the Prime Minister in his Independence Day speech in 2021.
- The Ministry of New and Renewable Energy is in the process of formulating guidelines for the scheme that seeks to promote the development of green hydrogen production capacity of at least 5 million metric tonnes (MMT) per annum with an associated renewable energy capacity addition of about 125 gigawatts (GW) by 2030.
- A major part of this is a proposed Strategic Interventions for Green Hydrogen Transition Programme (SIGHT), under which two financial incentive mechanisms — targeting domestic manufacturing of electrolysers and the production of green hydrogen — will be promoted.
- The steel sector has been made a stakeholder, and it has been proposed to set up pilot plants with part funding from the government to explore the feasibility of using green hydrogen in Direct Reduced Iron (DRI) production by partly replacing natural gas with hydrogen in gas-based DRI plants.

New Species of Dwarf Boa

Environment

Why in news?

- A new species of dwarf boa has been discovered in the upper Amazon basin.

About the new species-

- The snake from the Tropidophiidae family was found in the cloud forest in northeastern Ecuador and was up to 20 centimetres long.
- Tropidophis cacuangoae can be identified from other reptiles in the same genus based on its external features and bone structure.
- The scientists found two verified specimens of the species.
- Its colouring is primarily light brown with darker brown or black blotches — similar to a boa constrictor.
- The species inhabits eastern tropical piedmont and lower evergreen montane forests in the Amazon tropical rainforest biome and the researchers suspect it to be an Ecuadorian endemic.
- Both specimens were found within 50 kilometers of each other – Colonso Chalupas national reserve and in the private Sumak Kawsay park.
- The species is unusual for having a "vestigial pelvis", which is characteristic of primitive snakes. This could be evidence that snakes descended from lizards that lost their limbs over millions of years.
- The snake's name honours Dolores Cacuango, an early 20th-century pioneer in the fight for indigenous and farmers' rights in Ecuador.
- The discovery of T cacuangoae demonstrates that small and cryptic vertebrates can undergo large periods of time without being detected.

Neelakurinji a protected plant now

Environment

Why in news?

- The Ministry of Environment, Forest and Climate Change (MoEF) has listed Neelakurinji (Strobilanthes kunthiana) under Schedule III of the Wildlife (Protection) Act, 1972, including it on the list of protected plants.

About Neelakurinji

- Neelakurinji or Strobilanthes kunthiana means '**Blue Mountain**', literally the mountain where the flower blooms and turns into a blue/ purple colour.

- These flowers **belong to a shrub that is particularly found in the Shola forests of the Western Ghats** in Karnataka, Kerala, and Tamil Nadu.
- Most of these species have a **unique flowering cycle**, resulting from an annual to a 16-year blooming cycle.
- The **purplish blue flower blossoms only once in 12 years, and gave the Nilgiri Mountains its name**, from the Tamil language Kurinji (flower). a small shrub, blooms once in twelve years, covering the hillsides with bluish flowers, giving the Nilgiris its name.
- **The Paliyan tribal people living in Tamil Nadu** used it as a reference to calculate their age.
- The plant is endemic to a small stretch in the Western Ghats from the Mangaladevi hills to the Nilgiris hills.
- In the Western Ghats region, nearly 70 varieties of Neelakurinji plants have been identified and the most popular Neelakurinji is Strobilanthes kunthiana which blooms once in 12 years.
- However, some other rare varieties of Neelakurnji are also found in the Western Ghats region.
- The Eravikulam National Park, near Munnar, is known for widespread blooming of the kurinji, with the next flowering season expected in 2030.

Energy Technology Perspectives 2023 report on Green Steel

Environment

Why in news?

- International Energy Agency in its Energy Technology Perspectives 2023 report has said that most net-zero emission routes for steel and cement production are not yet commercially available despite a few companies in the automotive sector committing themselves to use 'green steel'.

What is green steel?

- Essentially, green steel is the manufacturing of steel without the use of fossil fuels.
- So-called "green hydrogen" is one solution that could help reduce the steel industry's carbon footprint.

Key highlights of the report

- Solar and wind energy units require more steel, aluminium and in some cases, cement per unit of capacity than fossil fuel-based generating technologies.
- In order to manufacture technologies for renewable energy production, the steel and cement industry must target around 130 megatonnes (Mt) of primary steel and 370 Mt of cement production by 2030.
- Among certain project assessments that the researchers consider likely to achieve near-zero emission production immediately, they found only 10 per cent preparation towards a decarbonising effort for primary steel and 3 per cent for cement.
- These projects are mainly in Europe and North America, but demand grows most in emerging markets and developing economies, pointing to the need for increased international cooperation, the document observed on net-zero scenario projections.
- Key technologies such as carbon capture, utilisation and storage for cement and steel industries and hydrogen-based steel manufacturing are still in prototype and demonstration stages.
- Energy resources being concentrated in one geographical area pose a threat to the world's energy security, as evidenced by Russia's war on Ukraine.
- **Currently, China is the dominant producer of solar panels, wind, Electric Vehicle (EV) batteries, electrolyzers and heat pumps.**
- **Lithium**, a key metal for producing electronic vehicles, **is mostly concentrated in Australia, Chile and China.**
- Meanwhile, 70 percent of the world's cobalt is produced in the Republic of Congo.
- Tight supply chains increased the prices of EV batteries and wind turbines outside China for the first time in 2022.

Remains of four species of Dinosaurs found in Chilean Valley

Environment

Why in news?

- Scientists have found the remains of four species of dinosaurs, including a megaraptor, in a valley in Chilean Patagonia.

Key findings-

- The fossils were found in Cerro Guido, in southern Chile's Las Chinas valley near the border with Argentina, and taken to a laboratory in 2021.

- The researchers said they belong to dinosaurs that have not previously been identified in the area.
- They identified the remains including teeth and postcranial bone pieces of four species of dinosaur including the megaraptor, which belongs to the theropod family.
- These carnivorous dinosaurs had raptor claws, small teeth for tearing, and large upper limbs which, according to the research, put them at the top of the food chain in the region, which they inhabited between 66 and 75 million years ago, at the end of the Cretaceous period.
- They also identified two specimens of Unenlagiinae, closely related to velociraptors and which have a "novel evolutionary character, which would indicate that this is a new species of unenlagine or perhaps a representative of a different clade (group).
- They also found remains of two bird species: an Enantiornithe, the most diverse and abundant group of birds of the Mesozoic; and Ornithurinae, a group directly related to present-day birds.

Asian WaterBird Census, 2023

Environment

Why in news?

- A birds survey was conducted in Alappuzha, Kerala and Soor sarovar (UP) as part of Asian WaterBird Census 2023.

About the report

- It showed that the populations of some migratory waterbirds, especially duck species, visiting the region are falling.
- The survey jointly organised by the Social Forestry wing of the Forest department and Birders Ezhupunna, a birdwatching group, recorded 15,335 birds of 117 species.
- The most shocking aspect was that duck species like Northern Shoveler, Common teal and Eurasian wigeon, sighted in the previous surveys, were totally missing this time around.
- Climate change has affected the number of birds visiting the region.
- The survey was also conducted at Soor Sarovar Wildlife Sanctuary and found that lesser migration of winter migratory water birds from far Central Asia and North Asia, including Russia and Siberia, was recorded this year in comparison to previous years.
- Both Great White Pelicans and Dalmatian Pelicans arrived at Soor Sarovar Wildlife Sanctuary in a lesser number this year compared to the previous year.
- Soor Sarovar is one of 467 IBA Sites (Important Bird & Biodiversity Area) in India having rich birdlife diversity.

About the Asian Waterbird Census(AWC)

- This citizen-science event takes place every January.
- The AWC is **an integral part of the global waterbird monitoring programme, the International Waterbird Census (IWC)**, coordinated by Wetlands International.
- It runs in parallel with other regional programmes of the International Waterbird Census in Africa, Europe, West Asia, the Neotropics and the Caribbean.
- **The AWC was initiated in 1987 in the Indian subcontinent** and since has grown rapidly to cover major regions of Asia, from Afghanistan eastwards to Japan, Southeast Asia and Australasia.
- The census thus covers the entire East Asian – Australasian Flyway and a large part of the Central Asian Flyway.

Global Risk Report-2023

Environment

Why in news?

- Global Risks Report 2023 has been **released by the World Economic Forum (WEF)** recently.

Key findings of the report

- It is titled as 'Cooperation in a Fragmented World'.
- According to this report, 'Natural disasters and extreme weather events' is the second-most severe risk that the world needs to be prepared for in the next two years.
- In fact, 'cost of living' ranks as the top most serious global risk in the short term (over the next two years).

- It warned that over the next 10 years or by 2033, the interconnections between biodiversity loss, pollution, natural resource consumption, climate change and socioeconomic drivers will make for a dangerous mix.
- In the meantime, the current global pandemic and war in Europe has been held responsible for the energy, inflation and food crises.
- 'Global risk' is defined as the possibility of the occurrence of an event or condition which, if it occurs, would negatively impact a significant proportion of global gross domestic product, population or natural resources, according to the WEF.
- In 10 countries, natural disasters and extreme weather events were perceived to be the top most severe risk in the short term or in the next two years.
- It also warned that the world may see a 'polycrisis' centred around natural resource shortages by 2030.
- The report was produced in partnership with Marsh McLennan and Zurich Insurance Group.

Liquified Natural Gas

Environment

Why in news?

- The European Union is reducing piped Russian gas by rapidly expanding imports of liquified natural gas (LNG), much of it fracked in the US.

About Liquified Natural Gas or LNG

- LNG is natural gas reduced to a liquid state (liquefaction) through intense cooling to around -161 degrees Celsius (-259 Fahrenheit).
- This liquid gas is 600 times smaller than the original volume and is half the weight of water.
- LNG is odourless, colourless, non-toxic and non-corrosive. Hazards include flammability after vaporisation into a gaseous state, freezing and asphyxia.
- The liquefaction process involves removal of certain components, such as dust, acid gases, helium, water, and heavy hydrocarbons, which could cause difficulty downstream.
- The compressed fossil fuel, which is constituted almost wholly of methane, a potent greenhouse gas, can be transported around the world by ship.
- After arriving at its destination, the cargo is regasified in a floating terminal and redistributed through pipelines.
- But despite LNG's export potential, the high cost of liquefaction and producing LNG has limited its market.

Nature Risk Profile

Environment

Why in news?

- The **UNEP and S&P Global recently launched** the Nature Risk Profile, a new methodology for analyzing companies' impacts and dependencies on nature.

What is a Nature Risk Profile?

- The Nature Risk Profile is aimed at enabling the financial sector to measure and address nature-related risk by providing scientifically robust and actionable analytics on nature impacts and dependencies.
- **The new methodology outlines metrics and data that enable companies and investors to identify and quantify nature-related exposure.**
- It covers several key areas, including risks arising from companies' impacts on biodiversity, risks arising from companies' dependencies on biodiversity and potential risks via proximity to biodiverse areas.
- The launch of the Nature Risk Profile methodology follows on the heels of the **adoption of the Kunming-Montreal Global Biodiversity Framework, in December 2022.**
- The Global Biodiversity Framework includes a target for governments to take legal, administrative or policy measures to encourage and enable businesses to regularly monitor, assess, and transparently disclose their risks, dependencies and impacts on biodiversity.
- **According to the World Economic Forum's 2023 Global Risks Report, biodiversity loss is the fourth most severe global risk over the next ten years** behind climate action failure, climate change adaptation, and extreme weather.
- **Developed by experts from across the conservation, business, and finance communities, it aligns with the emerging approach of the Taskforce on Nature-related Financial Disclosures (TNFD) and will support the implementation of TNFD's disclosure framework.**

- The methodology allows users to combine company-level information with best-practice nature-related data to calculate vital risk metrics.
- This methodology links science, policy and finance to bring nature to the heart of financial decision-making.

Swallowtail Butterfly

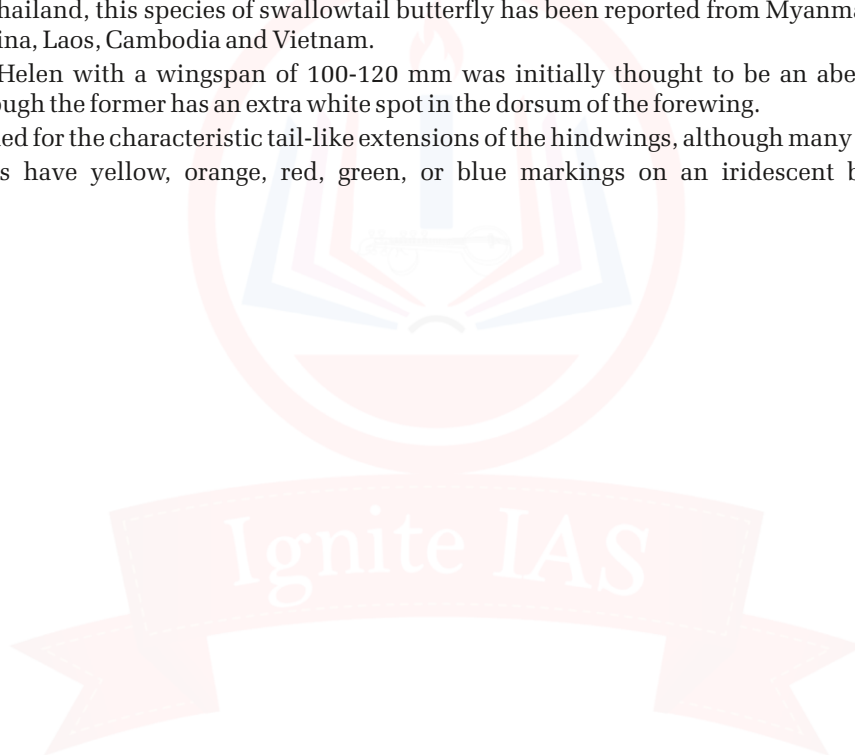
Environment

Why in news?

- A swallowtail butterfly disappearing from its previously known ranges from Myanmar and southern China to Vietnam has been recorded for the first time in India.

About the butterfly-

- The butterfly enthusiasts recorded the "extremely rare" Noble's Helen (*Papilio noblei*) from three locations in the Namdapha National Park of Arunachal Pradesh (India's easternmost tiger reserve).
- The locations are approximately 80 km aerially from Putao of Myanmar's Kachin State, where this species of swallowtail butterfly was last recorded in April 1999.
- The Noble's Helen, closest to the *Papilio antonio* from the Philippines and characterised by a much large dorsal white spot, was once common in the montane forest at moderate elevations in northern Thailand.
- Apart from Thailand, this species of swallowtail butterfly has been reported from Myanmar, Yunnan and Hubai regions of China, Laos, Cambodia and Vietnam.
- The Noble's Helen with a wingspan of 100-120 mm was initially thought to be an aberration of the *Papilio helenus* although the former has an extra white spot in the dorsum of the forewing.
- They are named for the characteristic tail-like extensions of the hindwings, although many species are tailless.
- Many species have yellow, orange, red, green, or blue markings on an iridescent black, blue, or green background.



Why in news?

- The Union Ministry for Health & Family Welfare has published the Rural Health Statistics 2021–2022 recently.

About the Statistics

- It provides data on health infrastructure including manpower up to 31st March of every year.
- As per this report, **India's rural healthcare system continues to be plagued by shortfall on two critical fronts — doctors and infrastructure.**
- There is a shortage of 83.2 percent of surgeons**, 74.2 percent of obstetricians and gynaecologists, 79.1 percent of physicians and 81.6 percent of paediatricians.
- Less than half the Primary Health Centres (PHC) function on a 24x7 basis.
- In the Indian healthcare system, sub-centres (SC) are the first point of contact for a patient, catering to a population of 3,000-5,000. This is succeeded by a PHC, which is required to look after the daily needs of 20,000-30,000 people.
- Community Health Centres (CHCs) provide referrals and access to specialists, catering to 80,000-120,000 people.
- SCs, PHCs and CHCs had more staff in 2021, at the height of the deadly second wave of COVID-19, as compared to now.
- The number of auxiliary nurse midwives at SCs has decreased in 2022. The shortage was most pronounced in Uttar Pradesh, Gujarat, Himachal Pradesh, Odisha and Uttarakhand.**
- The number of doctors at PHCs has shrunk to 30,640 in 2022 from 31,716 in 2021.
- Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat and Odisha face the highest shortage in surgeons, obstetricians / gynaecologists, paediatricians and radiographers at CHCs across the country.
- Urban PHCs, part of the National Health Mission's efforts to set up multi-tier health centres catering to a population of 50,000-75,000, also face severe shortages.**
- A huge improvement has been recorded as compared to 2005, when the government launched the National Rural Health Mission.

NCPCR Guidelines on Preliminary Assessment

Polity and Governance

Why in news?

- The National Commission for Protection of Child Rights (NCPCR) has come up with draft guidelines on the preliminary assessment of whether certain minors are to be tried under law as adults in particular cases, under the Juvenile Justice (Care and Protection of Children) Act.

About preliminary assessment as per the JJ Act

- Earlier, all children under the age of 18 were considered minors by the law, but through an amendment in 2015, a provision was added to the JJ Act for trying a child in conflict with the law as an adult.
- Under this, a child in the age group of 16-18 years could be tried as an adult in case of heinous offences.
- Section 15 (1) of the Act states that the Juvenile Justice Board shall conduct a preliminary assessment to determine whether to try such a child as an adult or a minor.
- The Act directs that the Board shall consider the mental and physical capacity of the child for committing the alleged offence, the ability to understand the consequences of the offence, and the circumstances in which the offence was committed.
- It states that the Board can take the assistance of experienced psychologists or psychosocial workers or other experts.
- The Act also gives a disclaimer that the assessment is not a trial, but is only to assess the capacity of the child to commit and understand the consequences of the alleged offence.
- After the assessment, the Board can pass an order saying there is a need to try the said child as an adult and transfer the case to a children's court with the relevant jurisdiction.
- If tried as a minor, the child could be sent to a special home for a maximum of three years.
- If tried as an adult, the child can be sentenced to a jail term, except being sentenced to death or life imprisonment without the possibility of release.

About the guidelines

- The NCPCR has framed guidelines which describe the key procedures to conduct the preliminary assessment.
- **The draft relying on already existing provisions in the Act says that the preliminary assessment has to determine four aspects:**
- **Physical capacity of the child:** To determine the child's 'locomotor' abilities and capacities, particularly with regard to gross motor functions such as walking, running, lifting, throwing...such abilities as would be required to engage in most antisocial activities.
- **Mental capacity:** To determine the child's ability to make social decisions and judgments. It also directs assessments pertaining to mental health disorders, substance abuse, and life skills deficits.
- **Circumstances in which the offence was allegedly committed:** Psychosocial vulnerabilities of the child. This is to include life events, any trauma, abuse, and mental health problems, stating that the offence behaviour is a cumulative consequence of a lot of other circumstances.
- **Ability to understand the consequences of the alleged offence:** To determine the child's knowledge or understanding of the alleged offense's social, interpersonal and legal consequences. These include what others will say or perceive him, how it might affect his personal relationships and the knowledge of relevant laws, respectively.
- It also states that the experts must be given an optimal opportunity to interact with the child to build a rapport. Experts can be from the field of child psychology and psychiatry.
- A copy of the assessment must be given to the child and a legal aid counsel must be present during the assessment. It must be within three months of the child being produced before the Board.
- **Other reports that the Board is to rely on include the Social Investigation Report, Social Background Report and Individual Care Plan,** statements of witnesses and interaction with parents, guardians, school staff, peer groups and neighbors.

Lokur Committee on Criteria for Recognition of any Community under the ST list

Polity and Governance

Why in news?

- The Office of the Registrar-General of India (RGI) is following the set of criteria set out by the Lokur Committee nearly 60 years ago to define any new community as a Scheduled Tribes.

Criteria set out by the Lokur Committee-

- The criteria set out by the Lokur Committee for defining a community as a tribe are:
- Indications of primitive traits.
- Distinctive culture.
- Geographical isolation.
- Shyness of contact with the community at large.
- Backwardness.

Government task force on Scheduling of Tribes-

- The government task force on Scheduling of Tribes constituted under the leadership of then Tribal Affairs Secretary, Hrusikesh Panda in February 2014, had concluded that these criteria(Lokur Committee) may have become obsolete considering the process of transition and acculturation.
- Further, it noted that terms like primitive and the requirement of primitivity to be a characteristic of Scheduled Tribe indicates a condescending attitude by outsiders.
- **The Task Force had recommended changes to the criteria** in May 2014 and based on this, the Tribal Affairs Ministry had in June 2014 prepared a draft Cabinet note to overhaul the criteria and procedure for scheduling of new communities as STs.
- **The new criteria under the government's consideration included,**
- Socio-economic, including educational, backwardness, vis-a-vis, the rest of the population of the State.
- Historical geographical isolation which may or may not exist today.
- Distinct language/dialect.
- Presence of a core culture relating to life-cycle, marriage, songs, dance, paintings, folklore.
- Endogamy, or in case of exogamy, marital relationship primarily with other STs (This criterion is for scheduling of a community as ST and not for determining ST status of an individual).

- The draft Cabinet note also proposed that communities which have adopted a 'Hindu' way of life will not be ineligible merely on this ground.
- It further recommended considering the population of the new community in relation to the existing ST population of the State, adding that all these criteria had to be looked at holistically and none should take precedence over another

Supreme Court on Demonetisation

Polity and Governance

Why in news?

- The Supreme Court Constitution Bench has upheld by 4:1 majority the decision taken by the Union Government six years ago to demonetise the currency notes of Rs. 500 and Rs.1000 denominations.

About the verdict

- The majority held that Centre's notification dated November 8, 2016 is valid and satisfies the test of proportionality.
- The Supreme Court accepted the government's views that there was consultation between the Centre and the RBI before demonetisation and there was a reasonable nexus to bring such a measure.
- The court said the notification to scrap the high-value currency notes, cannot be said to be unreasonable and struck down on the ground of decision-making process.
- The top court's remarks came when the Reserve Bank of India counsel made the submission that judicial review cannot apply to economic policy decisions.
- RBI had told the apex court about the objective of the demonetisation policy to curb black money and fake currencies.
- Justice Nagarathna, however, differed from the majority judgment on the point of the Centre's powers under section 26(2) of the RBI Act.
- She further said that Parliament should have discussed the law on demonetisation, the process should not have been done through a gazette notification. Parliament cannot be left aloof on an issue of such critical importance for the country.

AISHE Report

Polity and Governance

Why in news?

- The Ministry of Education, Government of India has released All India Survey on Higher Education (AISHE) 2020-2021.

About AISHE

- The Ministry has been conducting **AISHE since 2011, covering all higher educational institutions** located in Indian Territory and imparting higher education in the country.
- **The survey collects detailed information on different parameters such as student enrollment, teacher's data, infrastructural information, financial information etc.**
- **For the first time, in AISHE 2020-21, HEIs have filled data using an entirely online data collection platform through the Web Data Capture Format (DCF)** developed by the Department of Higher Education through the National Informatics Centre (NIC).

Findings of the report

- It showed a 7.5% increase in student enrolments across the country compared to 2019-20, with total student enrolments reaching 4.13 crore.
- The survey also revealed that in 2020-21, the year when the COVID-19 pandemic began, there was a 7% rise in enrolments in distance education programmes.
- While the increase was noted in absolute numbers compared to 2019-20, the proportion of SC students dropped to 14.2% in 2020-21 from 14.7% the previous year and the proportion of OBC students dropped to 35.8% in 2020-21 from 37% the previous year.
- Further, the proportion of Muslim students enrolling for higher education dropped from 5.5% in 2019-20 to 4.6% in 2020-21 with the proportion of 'other minority students' dropping from 2.3% to 2% in the same period.

- The number of students in the Persons with Disabilities category also dropped in 2020-21 to 79,035 from 92,831 the previous year.
- However, the female enrolment in higher education programmes had increased and the Gross Enrolment Ratio for all enrolments (as per 2011 Census) increased by over 2 points to 27.3.
- The highest enrolment was seen at the undergraduate level, which accounted for 78.9% of all enrolments, followed by postgraduate level courses, which accounted for 11.4% of the year's total enrolments.
- Among all undergraduate enrolments, the most popular remained the Bachelor of Arts programme, which saw 104 lakh enrolments followed by Bachelor of Science courses, where too women outnumbered men.
- This was followed by the Bachelor of Commerce programme, where women accounted for 48.5% enrolments.
- However in B.Tech and Bachelor of Engineering courses, women accounted for less than 30% of all enrolments.
- At the postgraduate level, the most popular courses remained in the Social Sciences stream, followed by Science courses.
- Except for management courses at the PG-level, where enrolment of women stood at 43.1%, all other PG courses saw women outnumbering men.
- At the PhD level, the most popular course was in the field of Engineering and Technology, followed by Science; in both disciplines, women accounted for less than 50% enrolments (33.3% for Engineering and Tech; and 48.8% for Science).
- The overall figures for STEM enrolments (at all levels of higher education) showed that women lagged behind men, who accounted for over 56% of enrolments in these fields.
- During 2020-21, the number of Universities has increased by 70, the number of Colleges has increased by 1,453.
- The maximum increase came in State public universities and State private universities, followed by a rise of 14 in the number of Institutes of National Importance, and an increase of 3 in the number of Central Universities.
- Government universities constituting 59.1% of total universities contribute 73.1% of total enrolment, whereas the 40% private universities account for only 26.3% of total enrolment.
- The number of teachers increased across higher education institutes, SC and ST teachers continued to be under-represented.
- At All-India level, 56.2% teachers belong to General category; 32.2% to OBC; 9.1% to SC and 2.5% to ST category.
- About 5.6% teachers come from Muslim minority group and 8.8% are from other minority groups.
- The survey also found that there were 75 women teachers to every 100 male ones across institutes in the country.
- The teacher-pupil ratio was at 27 for all universities, colleges and standalone institutions and at 24 if only regular mode is considered.
- It concluded that the best teacher-pupil ratio was found in States like Tamil Nadu and Karnataka.
- While Uttar Pradesh; Maharashtra; Tamil Nadu; Madhya Pradesh; Karnataka and Rajasthan are the top 6 States in terms of number of students enrolled, Uttar Pradesh; Maharashtra; Karnataka; Rajasthan; Tamil Nadu; Madhya Pradesh; Andhra Pradesh and Gujarat are the top 8 States in terms of number of colleges.

The National Geospatial Policy, 2022

Polity and Governance

Why in news?

- The Ministry of Science and Technology has published the National Geospatial Policy, 2022 recently.

Key highlights of the policy

- The 13-year guideline aims to promote the country's geospatial data industry and develop a national framework to use such data for improving citizen services, and more.
- Besides developing geospatial infrastructures, skill and knowledge, standards, businesses, among others, the policy aims to develop high resolution topographical survey and mapping, and a high-accuracy digital elevation model for the entire country by 2030.
- The policy will seek to develop a national geospatial data framework, and enable "easy availability" of data to businesses and the general public.
- By 2025, the government will look to improve availability and access of "better location data" for companies, including private organisations.
- The government will look to establish an Integrated Data and Information Framework, under which a Geospatial Knowledge Infrastructure (GKI) will be developed by 2030.
- By 2035, goals of usage of geospatial data will include mapping of sub-surface infrastructure in major cities and towns across India, and development of high resolution, accurate bathymetric geospatial data (resources and

economy of inland waters, sea surface topography of shallow and deep seas) to support India's 'Blue Economy'.

- The policy outlines the formation of an apex body at the national level to be known as the Geospatial Data Promotion and Development Committee (GDPDC), responsible for providing details on the use of geospatial data in governance across specific ministries and for enabling the development of private startups and companies to work on specific projects.
- It would also support the use of National Digital Twin, which is an ecosystem of high-resolution data used to promote connected digital twins among private enterprises "with safe and interoperable data sharing."
- The strategy outlines the creation of 14 National Fundamental Sectoral Geospatial Data Themes that will be used to address various sectors that promote the development of commercial geospatial applications in disaster management, mining, forestry, and others.

Remote Voting Facility for Migrant Workers

Polity and Governance

- The Election Commission is considering a remote voting facility for migrant workers.

What Is Remote Electronic Voting Machine?

- The RVM is an idea that will bring approximately 30 crore electors, currently not exercising their franchise, into the election fold. The inability to vote due to internal migration is one of the prominent reasons to be addressed in order to improve voter turnout and ensure participative elections. Approximately 85 per cent of the internal migration is within the states.
- To address this problem, the commission has developed a prototype Multi-Constituency Remote Electronic Voting Machine which can handle multiple constituencies from a single remote polling booth.
- RVM is a modified version of the time-tested model of M3 EVMs, to enable voting at remote polling stations.
- The commission has been working with the two Public Sector Units, that are manufacturing the existing EVMs – Bharat Electronic Limited (BEL) and Electronics Corporation of India Limited (ECIL) to develop a robust, failproof and efficient stand-alone system for remote voting.
- The proposed RVM system would enable domestic migrants to cast votes in their home constituencies, from remote locations. These remote voting booths would also cater to voters from multiple constituencies of a state.

How To Use The RVM?

- The voter should pre-register for the remote voting facility by applying online/offline within a pre-notified time, before elections in his home constituency commence.
- Voter details will be verified at the home constituency and the voter's request for remote voting will be approved after successful verification by marking him/her as a remote voter to participate in elections.
- Special multi-constituency remote voting polling stations will be set up in the places of the voter's current residence.

Features Of RVM

- It is a standalone, non-networked system having the same security features as the existing Indian EVMs and provides the same voting experience to the voter as the EVM. The RVM system is essentially a modified version of the existing EVM system.
- RVM will be used in multi-constituency polling stations set up in remote locations.
- A single Ballot Unit (BU) can cater to multiple AC/ PCs at a single polling station by using a dynamic ballot display instead of the usually printed paper ballot sheet on BU.

Draft Amendments proposed to Regulate Online Gaming

Polity and Governance

Why in news?

- The Ministry of Electronics and Information Technology has recently released draft amendments to the IT intermediary rules 2021, pertaining to Online Gaming for public consultations.

About Draft amendments

- The draft has been prepared to ensure that online games should be offered in conformity with Indian laws and that the users of such games be safeguarded against potential harm.
- In December 2022, the Government through a gazette notification, notified change in Allocation of Business rules designating Meity as the nodal ministry for online gaming related concerns.

- Government aims for the online gaming ecosystem to expand & grow and be an important catalyst to India's One trillion dollar Digital economy goal by 2025-26.
- The draft has proposed a self-regulatory mechanism which, in future, may also regulate the content of online gaming and ensure that the games do not have violent, addictive or sexual content.
- As of now, the age gating is 18 years and the Government would like to keep it that way.
- Around 40 to 45 percent of the gamers in India are women, and hence it was all more important to keep the gaming ecosystem safe.
- The draft rules have strict provisions against betting and wagering.
- The draft proposal defines an 'online game' as "a game that is offered on the internet and is accessible by a user through a computer resource if he makes a deposit with the expectation of earning winnings".
- 'Winning' constitutes any prize, in cash or kind, intended to be given to the participant "on the performance of the user and in accordance with the rules of such online game".
- This addresses the discourse in the sector about the definitions of a 'game of skill' and 'game of chance'.
- The term 'game of skill' had been used in the Public Gambling Act (1867) but had not been defined.
- The game operators would have to verify users on the platform and provide them with the terms of services.
- For the monetary aspect of it, operators would have to inform the user about the policy related to withdrawal or refund of their deposit, measures taken for its protection, the manner and distribution of winnings and the fees and other charges to be paid by the user.
- They would also have to be informed about the risk of potential financial loss and addiction associated with the game.
- The self-regulating bodies' framework must also include safeguards to protect children.
- Addiction is to be combated using repeated warning messages should the user exceed a reasonable duration while playing a certain game.
- At the time of onboarding a user, the operator would be expected to verify the identity of the user.
- It also puts forth measures for users who register their devices from India or use their services from India, to voluntarily verify their accounts.
- They would be provided with a "demonstrable and visible" mark of identification.
- The information gathered for verification cannot be used for any other purpose without the user's consent.

Rules for platforms

- Before hosting or publishing a game, the **platform would have to verify it from the self-regulatory body** it is associated with.
- It would then be required to **carry a registration mark** on all its recognised online games.
- The platform is expected to **appoint a key management personnel or senior employee as its Chief Compliance Officer** who would be entrusted with coordinating with law enforcement agencies to ensure compliance with their orders or requisitions.
- In addition to this, the platforms are also expected to **additionally appoint a 'Nodal Contact Person'** to facilitate the necessary coordination at any point of the day.
- Further, it must have in place an **appropriate mechanism for receipt and resolution of grievances**.
- The complainant must be able to track the status of the same using a unique ticket number.
- The gaming intermediaries **must have a physical address in the country which must be published on its website and app**.
- MeitY is entrusted with the responsibility of recognising and if required, un-recognising all self-regulated bodies under the proposed framework.

Chargesheets are not Public Documents

Polity and Governance

Why in news?

- The Supreme Court ruled that the government is not required to post chargesheets on police or official websites in order to give the public unrestricted access to them.

About chargesheet

- A **chargesheet is the final report created by a police officer or investigating agency** following the conclusion of their investigation into a case, as described by **Section 173 of the Criminal Procedure Code**.
- According to **section 173(2) of the CrPC**, the chargesheet in **K Veeraswami v. Union of India & Others (1991)** is the police officer's final report.

- If a **chargesheet isn't filed against the suspect within the required window of 60 to 90 days**, the **arrest is invalid** and the suspect is eligible for bail.

Chargesheets not considered Public Documents

- A chargesheet cannot be made public, according to the Court, because it is **not a "public document"** as defined by **Sections 74 and 76 of the Evidence Act, 1872**.
- Public papers are those that are actions or records of sovereign authority, official bodies, tribunals, and public offices, whether legislative, judicial, or executive, in any region of India, the Commonwealth, or a foreign country, according to Section 74. Public records "maintained in any State of private documents" are also included.
- The public body in charge of them must produce certified copies of the papers indicated in this section as they are solely public records.
- Under this clause, copies of chargesheets and other necessary public papers are not considered to be public documents.
- **Section 76 specifies** that every public official who has custody of such documents must deliver a copy upon request and legal fee payment, together with an attestation certificate that includes the date, seal, name, and position of the officer.
- All documents other than those mentioned in Section 74 are considered private records under Section 75 of the Evidence Act.

UGC norms for Foreign Universities

Polity and Governance

Why in news?

- The University Grants Commission (UGC) has announced draft norms for facilitating foreign universities and educational institutions to set up campuses in India which allow them autonomy in determining fees, as well as a 90-day approval process.

About the guidelines:

- Criteria for Foreign universities:
- Only the universities that are placed at the top 500 either in the overall or the subject-wise category, in global rankings such as QS, can apply to enter India.
- Universities that do not participate in such rankings must be "reputed" in their countries to be able to apply.
- The draft regulations do not specify a metric to judge the 'reputation' of the university.

Key provisions:

- They have been granted free will to decide the fee structure and admission criteria for students.
- The universities have the autonomy to their professors and faculty from India or abroad.
- They can repatriate funds from their home jurisdiction.
- They are not abiding to offer courses that are in favour of India's national interest.
- Provisions in favour of India:
- The draft states that the UGC will have the right to inspect the campuses at any time.
- The draft says the UGC shall impose a penalty and/ or suspend/ withdraw its approval at any time if the university's activities or academic programmes are against the interest of India.
- It also requires the foreign universities to submit audit reports and annual reports to the UGC certifying that operations in India are in compliance with Foreign Exchange Management Act, 1999 (FEMA) and other relevant government policies.

Significance of the initiative:

- In line with National Education Policy 2020:
- The top universities in the world will be facilitated to operate in India, and a legislative framework facilitating such entry will be put in place, and such universities will be given special dispensation regarding regulatory, governance, and content norms on par with other autonomous institutions of India.
- In a way, the draft regulations released seek to institutionalise the NEP's vision.
- **Need for allowing Foreign Universities to set-up Campuses in India**
- The UGC chief pointed out that in 2022 over 4.5 lakh Indian students went abroad to study, leading to outflow of estimated \$28-30 billion.



- Allowing foreign universities to set-up campuses in India will also ensure that all our students — there are around 40 million pursuing higher education — have access to global quality education.
- The ideal of setting up foreign universities' campuses in India is also mentioned in the **National Education Policy 2020**.

University Grants Commission:

- The University Grants Commission of India is a statutory body under the provisions of UGC Act, 1956.
- It is responsible for coordination, determination and maintenance of standards of higher education.
- It provides recognition to universities in India, and disburses funds to such recognized universities and college.
- **Nodal Ministry:** Department of Higher Education, Ministry of Education

17th Annual Status of Education Report (ASER) for 2022

Polity and Governance

Why in news?

- The NGO Pratham has released the Annual Status of Education Report (ASER) 2022 recently.

Findings of the report

- ASER is a household survey conducted across 616 rural districts and covers 6.9 lakh children in the age group of 3 to 16 years to record their schooling status and assess their basic reading and arithmetic skills.
- The report is being brought out after four years and records the impact of school closures in 2020 and 2021, as well as the return to school of children in 2022.
- The national-level study shows that despite school closures during the pandemic, the overall enrolment figures, which have been above 95% for the past 15 years for the 6 to 14 years age group, increased from 97.2% in 2018 to 98.4% in 2022.
- But the learning gap widened for foundational skills in reading and arithmetic, reversing several years of improvement.
- The proportion of children in this (3-16 years) age group who are not currently enrolled also dropped to its lowest level ever to 1.6% from 2.8% in 2018, when the last full-scale ASER survey was conducted.
- Government schools have seen a sharp increase in children enrolled from 65.6% in 2018 to 72.9% in 2022.
- Children's basic literacy levels have taken a big hit, with their reading ability as compared to numeracy skills worsening much more sharply and dropping to pre-2012 levels.
- The percentage of children in Class 3 in government or private schools who were able to read at the level of Class 2 dropped from 27.3% in 2018 to 20.5% in 2022. This decline is visible in every State, and for children in both government and private schools.
- States showing a decline of more than 10 percentage points from 2018 levels include those that had higher reading levels in 2018, such as Kerala (from 52.1% in 2018 to 38.7% in 2022), Himachal Pradesh (from 47.7% to 28.4%), and Haryana (from 46.4% to 31.5%).
- Large drops are also visible in Andhra Pradesh (from 22.6% to 10.3%) and Telangana (from 18.1% to 5.2%).
- States showing a decrease of 15 percentage points or more include Andhra Pradesh, Gujarat, and Himachal Pradesh.
- The ASER reading test assesses whether a child can read letters, words, a simple paragraph at Class 1 level of difficulty, or a story at Class 2 level of difficulty.
- While families withdrew students from private schools to save money spent on tuition fees, they also invested in private tuition classes, which increased as the proportion of such students rose further from in 2022 in both private and government schools.
- The report also lays to rest apprehensions about the pandemic forcing families to withdraw girls from schools and force them into early marriages.
- It finds that the percentage of girls in the age group of 11-14 years who were out of school declined to 2% from 4.1%.

Why in news?

- The Reserve Bank of India (RBI) released the 26th issue of the **Financial Stability Report (FSR)**.

Key findings of the FSR

- In September 2022, the **gross non-performing assets (GNPA) ratio** of all Scheduled Commercial Banks (SCBs) was **at a seven-year low**.
- GNPA ratio is the proportion of gross non-performing assets in gross loans and advances.
- The GNPA's are bad loans which the borrower is not in a position to repay at the moment.
- A loan turns bad or becomes an NPA if they are overdue for over 90 days.
- In September 2022, the **net non-performing assets (NNPA) ratio** was **at a ten-year low**.
- NNPA ratio is the proportion of net non-performing assets in net loans and advances.
- Banks have to set aside (or provision) a part of their profit as a buffer for potential losses that may arise from the NPAs. Thus, **NPAs reduce a bank's available capital to lend fresh loans**.
- The NNPA deducts these provisions from GNPA and so **is a better indicator of the bad loans in a bank's books**. **Chart 1** shows the NNPA ratio of all SCBs.
- These two data points show that **the issue of non-performing assets**, which was a major headache for banks after the RBI carried out an expansive asset quality review in 2015, **is not that troubling anymore**.

The report and Indian Scenario

- India is expected to be the **fastest growing economy of the seven largest Emerging Markets and Developing Economies (EMDEs)**.
- The Indian economy is projected to grow at a robust **6.6% in 2023-24 (FY24)**, slowing down from an estimated **6.9% in 2022-23 (FY23)**, due to limited spillovers to Asia's third largest economy from a projected global slowdown.
- The report, however, noted that **consumer inflation was above the RBI's upper tolerance limit** of 6%, for most of the last year. This led to the policy rate to be raised by 2.25% points between May and December.
- India's **goods trade deficit has more than doubled since 2019**, and was \$24 billion in November, with deficits for crude petroleum and petroleum products (\$7.6 billion) and other commodities (ores and minerals at \$4.2 billion) accounting for the widening.
- However, governments increased infrastructure spending and various business facilitation measures,

Why in news?

- In a first-of-its-kind move aimed at **improving audit quality**, the National Financial Reporting Authority (NFRA) has published draft requirements regarding preparation and publication of **Annual Transparency Report (ATR)** by auditors/audit firms.

About NFRA

- The National Financial Reporting Authority (NFRA) was constituted in 2018 under Companies Act, 2013.
- The Companies Act requires the NFRA to have a **chairperson who will be appointed by the Central Government** and a maximum of 15 members
- The duties of the NFRA are to:
- Recommend **accounting and auditing policies and standards** to be adopted by companies for approval by the Central Government;
- Monitor and enforce compliance** with accounting standards and auditing standards;
- Oversee the **quality of service of the professions** associated with ensuring compliance with such standards and suggest measures for improvement in the quality of service;
- Perform such other functions and duties as may be necessary or incidental to the aforesaid functions and duties.

- Prior to the constitution of this authority, the Central Government would prescribe accounting standards on the recommendation of ICAI.
- The Authority shall have power to **monitor and enforce compliance with accounting standards**, oversee the quality of service or **undertake investigation of the auditors** of the following class of companies and bodies corporate, namely:-
- **Companies whose securities are listed on any stock exchange in India or outside India;**
- **Unlisted public companies** having paid-up capital of not less than rupees five hundred crores or having annual turnover of not less than rupees one thousand crores or having, in aggregate, outstanding loans, debentures and deposits of not less than rupees five hundred crores as on the 31st March of immediately preceding financial year;
- **Insurance companies, banking companies**, companies engaged in the generation or supply of electricity
- Anybody corporate or company or person, or any class of bodies corporate or companies or persons, on a reference made to the Authority by the Central Government in public interest;

New Umbrella Entity

Economy

Why in news?

- The Reserve Bank of India (RBI) has put on hold licensing of the New Umbrella Entity (NUE) network, a fintech institution planned as a rival to National Payments Corporation of India (NPCI).

About NUE

- **NUE is an entity (under the Companies Act 2013) that will manage and operate the new payment system in the retail sector such as ATMs, POS, UPI etc.**
- **NUEs were supposed to set up and operate a new retail digital payment system** and manage clearing and settlement systems that could be an alternative to the bank-promoted NPCI.
- The NUE shall be a Company authorised by Reserve Bank of India (RBI) under Section 4 of the Payment & Settlement Systems Act ('PSSA'), 2007.
- These NUEs would be primarily responsible in developing new payment systems, standards and technologies, clearing and settlement mechanisms, while monitoring, addressing and preventing relevant risks and frauds.
- It would diversify easy payment options beside boosting transaction volumes with tremendous expansion of e-commerce.
- Thus, NUE could also become instrumental in furthering financial inclusion and promotion of fintech.
- **The RBI had in 2020 issued guidelines for corporates to create for-profit NUEs** with an aim to **foster competition and "de-risk" India's burgeoning digital payments ecosystem**, where much of the settlement burden has fallen on the non-profit NPCI over recent years.
- **As per the rules, no single promoter could have over 40% stake**, which had to be lowered to less than 25% in five years of operation.
- Foreign companies can own a maximum of 25%, so are teaming up with local players. According to the RBI guidelines, the entity will have **minimum paid-up capital of Rs 500 crore**, with no single promoter group holding over 40 per cent investment in the capital.
- The new entity will have to abide by corporate governance norms and the 'fit and proper' criteria for persons to be appointed to the board.

About NPCI-

- NPCI was established by the RBI and the Indian Banks' Association in 2008 modelled on the non-profit payments and settlement entity run by the Swedish central bank that's owned and operated by banks.
- It runs the Unified Payments Interface (UPI) and other payment systems.
- It has developed the country's key payment railroads, including UPI, the Immediate Payments System (IMPS), RuPay and the National Financial Switch (NFS).
- It's also credited with powering the Direct Benefit Transfer architecture that supports the government's Jan Dhan Yojana.



Why in news?

- The Reserve Bank of India (RBI) announced that it will issue Sovereign Green Bonds (SgrBs) worth Rs 16,000 crore, in two tranches of Rs 8,000 crore each in the current financial year (2023-24).

About green bonds

- Green bonds are bonds issued by any sovereign entity, inter-governmental groups or alliances** and corporations with the aim that the proceeds of the bonds are utilised for projects classified as environmentally sustainable.
- Over the last few years, Green Bonds have emerged as an **important financial instrument to deal with the threats of climate change and related challenges**.
- Green Bonds offer investors a platform to engage in good practices**, influencing the business strategy of bond issuers.
- They provide a means to hedge against climate change risks** while achieving at least similar, if not better, returns on their investment.
- In this way, the growth in Green Bonds and green finance also indirectly works to disincentive high carbon-emitting projects.
- The framework for the sovereign green bond was issued by the government on November 9, 2022.
- In line with the commitment to significantly reduce the carbon intensity of the economy, the Union Budget 2022-23 made an announcement to issue Sovereign Green Bonds.
- The RBI would issue 5-year and 10-year green bonds of Rs 4,000 crore each on January 25 and February 9.
- The government will use the proceeds raised from SGrBs to finance or refinance expenditure (in parts or whole)** for various green projects, including in renewable energy, clean transportation, energy efficiency, climate change adaptation, sustainable water and waste management, pollution and prevention control and green buildings.

Example of Green Bonds:

- The World Bank is a major issuer of green bonds and issued **\$14.4 billion of green bonds between 2008 and 2020**.
- These funds have been used to support 111 projects around the world, largely in renewable energy and efficiency (33%), clean transportation (27%), and agriculture and land use (15%).
- By the end of 2020, 24 national governments had issued Sovereign Green, Social and Sustainability bonds totalling a cumulative \$111 billion.

Coal Ministry relaxation in Performance Bank Guarantee

Economy

Why in the news?

- Coal Ministry offered relaxation in Revision of Performance Bank Guarantee (PBG) and extended bid due date for Commercial Coal Block auction upto January 30.

What is a Performance Bank Guarantee?

- A bank guarantee is a kind of guarantee from a lending organisation.
- As per the provisions of the tender document, PBG to be submitted for each successfully auctioned coal mine is to be revised annually based on the National Coal Index (NCI) for the month of April in the beginning of the year.

About the National Coal Index (NCI)-

- NCI is a price index combining the prices of coal from all the sales channels- Notified Prices, Auction Prices and Import Prices.
- It reflects the change of price level of coal in a particular month relative to the fixed base year.
- The **base year for the NCI is FY 2017-18**.
- The concept and design of the Index as well as the Representative Prices have been developed by the Indian Statistical Institute, Kolkata.

- NCI is composed of a set of **five sub-indices**: three sub-indices for Non Coking Coal are combined to arrive at the Index for Non Coking Coal and the two sub-indices for Coking Coal are combined to arrive at the Index for Coking Coal.
- As per the grade of coal pertaining to a mine, the appropriate sub-index is used to arrive at the revenue share.

World Social Report 2023

Economy

Why in news?

- The UN Department of Economic and Social Affairs (DESA) has published the World Social Report 2023 recently.

About the report

- The report calls for concrete measures to support the greying global population, amidst escalating pension and healthcare costs.
- In 2021, 761 million people worldwide were aged 65 and older, which will rise to 1.6 billion by 2050.
- Northern Africa, Western Asia and sub-Saharan Africa, are on track to experience the fastest growth in the number of older people over the next 30 years.
- Today, Europe and Northern America combined, have the highest share of this population.
- While many older people are in excellent health or "economically active", others live with ailments or in poverty.
- In more developed regions, pensions and other public transfer systems provide over two thirds of the consumption by older persons.
- Their counterparts in less developed regions tend to work longer and rely more on accumulated assets or family assistance.
- Life expectancy is strongly influenced by factors such as income, education, gender, ethnicity and place of residence.
- The report recommends that countries rethink long-held policies and practices associated with livelihoods & work.

UN Department of Economic and Social Affairs (UN DESA)-

- **Rooted in the United Nations Charter and guided by the transformative 2030 Agenda** for Sustainable Development, the UN DESA upholds the development pillar of the United Nations.
- It brings the global community together to work towards **common solutions to the world's most pressing problems**.
- It helps countries translate their global commitments into national action in the economic, social and environmental spheres.
- **UN DESA is a pioneer of sustainable development** and the home of the Sustainable Development Goals (SDGs), where each goal finds its space and where all stakeholders can do their part to leave no one behind.

Oxfam Report -"Survival of the Richest"

Economy

Why in news?

- Oxfam India's report on inequality in India has been released recently.

Key Highlights of the report-

- According to the latest report, just 5 percent of Indians own more than 60 per cent of the country's wealth, while the bottom 50 percent of the population possess only 3 percent of the wealth.
- It also says that between 2012 and 2021, 40 percent of the wealth created in India has gone to just 1 percent of the population.
- The total number of billionaires in India increased from 102 in 2020 to 166 billionaires in 2022.
- India has the world's highest number of poor at 228.9 million.
- The combined wealth of India's 100 richest has touched \$660 billion (Rs 54.12 lakh crore), an amount that could fund the entire Union Budget for more than 18 months.

- The widespread hunger is resulting in 65 percent of the deaths among children under the age of 5 in 2022.
- Following the pandemic in 2019, the bottom 50 percent of the population have continued to see their wealth chipped away.
- Its impact has been exceptionally poor diet, increase in debt and deaths.
- Before the pandemic, in 2019, the Central Government reduced the corporate tax slabs from 30 per cent to 22 per cent, with newly incorporated companies paying a lower percentage (15 percent).
- This new taxation policy resulted in a total loss of INR 1.84 lakh crore and had a significant role in the 10 per cent downward revision of tax revenue estimates in 2019-20.
- Oxfam India has said that the failure to tax rich people and corporations fairly exacerbates inequality as governments then resort to taxing the rest of society more.
- It has said that the bottom 50 per cent of the population at an All-India level pays six times more on indirect taxation as a percentage of income compared to top 10 per cent
- A little less than two-third of the total GST is coming from the bottom 50 percent, as per estimates, one-third from the middle 40 per cent and only three to four per cent from the top 10 per cent.

Draft National Retail Trade Policy

Economy

Why in news?

- The Department for Promotion of Industry and Internal Trade (DPIIT) has sought the views of 16 departments and ministries on its draft national retail trade policy recently.

About the policy

- The policy would focus on formulating strategies to provide a globally competitive and sustainable environment for the overall development of retail trade through targeted efforts.
- The **objectives** of the policy include
- Ensuring easy and quick access to affordable credit.
- Facilitating modernization and digitisation of retail trade by promoting modern technology and superior infrastructural support.
- Development of physical infrastructure across the distribution chain.
- Promotion of skill development and improving labour productivity.
- Providing an effective consultative and grievance redressal mechanism for the sector.
- The government plans to put in place a single window clearance mechanism to acquire all registrations, licences or clearances for retail trade, and a Centralised Computerized Inspection Management System for inspections of retail entities.
- The draft also proposes an Accident Insurance Scheme for Traders to protect them from any untoward incidents besides setting up Traders Welfare Board at national, state and district levels.
- The policy is not intended for e-commerce, direct selling, multi-level marketing or street vendors and the government intends to provide a national common framework for development of the retail sector across the country through it.
- As per the draft policy, efforts will be made to replace licenses with a simple registering process and panIndia acceptance of a license issued by one state will be encouraged.
- The department has suggested review of eight laws including trade License, Insecticides Act, 1968, Consumer Protection Act, 2019 and License for Drugs and Cosmetics Act, 1940 to reduce the compliance burden and decriminalise minor technical or procedural offences.
- According to the draft, the government will promote indigenous manufacturing of retail related modern fixtures, digital equipment, devices and solutions and management tools while retailers will be encouraged to adopt the Open Network for Digital Commerce.

Why in news?

- The Securities and Exchange Board of India (SEBI) has launched an information database on municipal bonds recently.

What is the information database of SEBI?

- The information database **contains a wide range of information in the form of statistics and regulations, circulars, guidance notes** and Frequently Asked Questions issued by Sebi in respect of municipal debt securities.
- It contains various **checklists for pre-listing requirements and sample letters and certificates** from various intermediaries to be obtained by an issuer who plans to tap the municipal bond market.
- The SEBI information database can also be accessed by way of a Quick Response Code (QR Code).
- While this repository would serve as a guide, it is also hoped that it would result in more awareness.
- SEBI, in 2015, introduced a regulatory framework for the issue, listing and trading of Municipal Debt Securities; the same was further reviewed by SEBI in 2019.

Trade-plus-one (T+1) settlement plan**Economy****Why in news?**

- After China, India will become the second country in the world to start the 'trade-plus-one' (T+1) settlement cycle in top listed securities.

About T+1 Settlement Plan

- The T+1 settlement cycle means that **trade-related settlements must be done within a day**, or 24 hours, of the completion of a transaction.
- For example, under T+1, if a customer bought shares on Wednesday, they would be credited to the customer's demat account on Thursday.
- This is different from T+2, where they will be settled on Friday.
- As many as 256 large cap and top mid-cap stocks, including Nifty and Sensex stocks, will come under the T+1 settlement from January 27.
- The **United States, United Kingdom and Eurozone** markets are yet to move to the **T+1 system**.

Benefits of T+1 Settlement:

- A shortened cycle not only reduces settlement time but also reduces and frees up the capital required to collateralise that risk.
- It also reduces the number of outstanding unsettled trades at any instant, and thus decreases the unsettled exposure to Clearing Corporation by 50%.
- The narrower the settlement cycle, the narrower the time window for a counterparty insolvency/bankruptcy to impact the settlement of a trade.
- Further, the capital blocked in the system to cover the risk of trades will get proportionately reduced with the number of outstanding unsettled trades at any point of time.
- A shortened settlement cycle will help in reducing systemic risk.

Why in news?

- International Year of Millets (IYM) 2023 has kick started with Focussed Activities being undertaken by Central Ministries, State Governments and Indian Embassies.

About International Year of Millets

- The United Nations General Assembly (UNGA) at its 75th session in March 2021 declared 2023 the International Year of Millets (IYM 2023).
- FAO is the lead agency for celebrating the Year in collaboration with other relevant stakeholders.
- Spearheaded by the Prime Minister, the Government of India sponsored the proposal for IYM 2023 which was accepted by the UNGA.
- The PM of India has also shared his vision to make IYM 2023 a 'People's Movement' alongside positioning India as the 'Global Hub for Millets'.
- In April 2018, Millets were rebranded as "Nutri Cereals", followed by the year 2018 being declared as the National Year of Millets, aiming at larger promotion and demand generation.
- The global millets market is projected to register a CAGR of 4.5% during the forecast period between 2021- 2026.

About Millets

- **There are 16 major varieties of millet, which are produced and exported, including Sorghum (Jowar), Pearl Millet (Bajra), Finger Millet (Ragi) Minor Millets (Kangani), Proso Millet (Cheena), Kodo Millet (Kodo), Barnyard Millet (Sawa/Sanwa/Jhangora), Little Millet (Kutki), Two Pseudo Millets (BuckWheat/Kuttu), Amaranthus (Chaulai) and Brown Top Millet.**
- They are tougher and **drought-resistant crops**.
- Millets require **less water, fertiliser, and insecticides** to flourish in poor soil conditions.
- They are the ideal choice for "**climate-smart cereals**" due to their ability to resist greater temperatures.
- The word "millet" describes a number of small-seeded annual grasses that are typically farmed as grain crops on **marginal soils in arid regions of temperate, subtropical, and tropical climates**.
- The earliest evidence of these **grains dates to the Indus period**, making them one of the earliest plants domesticated for nourishment.
- It is grown in 131 countries, and 60 crore people in Asia and Africa consume it as part of their traditional diet.
- **India is the largest millet producer in the world.**
- It accounts for 20% of global production and 80% of production in Asia.
- **India** is the world's largest producer of millets **and the fifth-largest exporter** of them, producing all nine of the regularly used millets.
- **The principal states** that produce millets include Rajasthan, Uttar Pradesh, Haryana, Gujarat, Madhya Pradesh, Maharashtra, Karnataka, Tamil Nadu, Andhra Pradesh, and Telangana.
- **Millets made up around 40% of all cultivated grains before to the Green Revolution, but that percentage has since decreased to about 20%.**
- During the forecast period of 2021–2026, the worldwide millets market is anticipated to grow at a CAGR of 4.5%.

Measures adopted by the government to promote millets:

- Project for the **Intensified Promotion of Millet for Nutritional Security (INSIMP)**
- The government **increased millets' minimum support price (MSP)**, giving farmers a considerable financial incentive.
- In order to ensure a steady market for the produce, the government has now **included millets in the public distribution system**.
- **Assistance with Inputs:** The government has begun providing seed kits and other inputs to farmers, establishing value chains through Farmer Producer Organizations, and promoting the commercial viability of millets.
- **In the recent budget 2023-2024**, Government declared the **Indian Institute of Millets Research, Hyderabad as an Institute of Excellence**, which is engaged in the research and promotion of millets.

Why in news?

- Recently, the Indian Council of Agricultural Research (ICAR) has registered 10 new breeds of livestock species, including cattle, buffalo, goat and pig that has taken the total number of indigenous breeds to 212.

About the new species-

- The 10 new breeds included three new cattle breeds** (Kathani, Sanchori, Masilum), one buffalo breed (Purnathadi), three goat breeds (Sojat, Karauli, Gujari) and three pig breeds (Banda, Manipuri Black, Wak Chambil).
- Purnathadi buffalo is found in the Vidarbha region of Maharashtra.**
- The population of **Kathani, a dual purpose cattle, is also distributed in the region.** It possesses good draft ability and is suited to marshy land for paddy cultivation.
- Masilum** is a small-sized but well-built and **sturdy cattle of Meghalaya.** Well adapted to the hill ecosystem, **it is reared by the Khasi and Jaintia communities** for sports, manure and socio-cultural festivals.
- Sanchori is found in the Jalore district of Rajasthan.**
- Among goats, all the three new breeds are from different regions of Rajasthan.**
- Of the **new pig breeds, Manipuri Black is a native of Manipur, Banda is from Jharkhand** and Wak Chambil is from the Garo hills of Meghalaya.

- ICAR-National Bureau of Animal Genetic Resources, Karnal (NBAGR) is the nodal agency for the registration of breeds of the country.
- Newly identified breeds are approved by the Breed Registration Committee (BRC) of Indian Council of Agricultural Research (ICAR).
- Since 2010, this is the third highest increase in registration of indigenous breeds, after 15 new breeds in 2018-19 and 13 new breeds in 2019-20 were recorded.
- In 2010, there were only 129 indigenous breeds registered, called 'extant breeds'.
- The identification and registration of indigenous breeds started only after 2010.
- Those breeds which are not registered or identified are called 'non-descript'.
- In the 20th Livestock Census, while the population of exotic / crossbred cattle increased by 29.3 per cent, compared to the 2012 Census, the population of indigenous cattle declined by six per cent.

Why in the news?

- The Cabinet Committee on Economic Affairs (CCEA) has approved a **central sector scheme Broadcasting Infrastructure and Network Development (BIND)** at a cost of ₹2,539.61 crore up to 2025-26.

About the scheme

- BIND scheme is the vehicle for providing financial support to Prasar Bharati for expenses related to expansion and upgradation of its broadcasting infrastructure, content development and civil work.

Notable features

- It will enable the public broadcaster to undertake a major upgradation of its facilities with better infrastructure which will widen its reach, in the LWE, border and strategic areas and provide high quality content to the viewers.
- Another major priority area of the scheme is the development of high-quality content for both domestic and international audience and ensuring availability of diverse content to the viewers.
- It seeks to upgrade the capacity of DTH platform to accommodate more channels.
- The scheme will increase coverage of AIR FM transmitters in the country to 66 percent by geographical area and 80 percent by population up from 59 percent and 68 percent respectively.
- The scheme also envisages free distribution of over 8 lakh DD Free Dish STBs to people living in remote, tribal, left wing extremism inflicted and border areas.

Utkarsh 2.0

Economy

Why in news?

- The RBI recently launched Utkarsh 2.0, the second phase of the central bank's medium-term strategy for strengthening regulatory and supervisory mechanism.

Utkarsh 2.0

- Utkarsh 2.0 harnesses the strengths of Utkarsh 2022 by retaining the **six Vision statements** as well as Core Purpose, Values, and Mission statement.
- The **6 Vision** in Utkarsh 2.0 that will guide the RBI over the period **2023-25** includes:

Visions of Utkarsh 2.0

- Excellence in performance of its functions.
- Strengthened trust of citizens and Institutions in the RBI.
- Enhanced relevance and significance in national and global roles.
- Transparent, accountable and ethics-driven internal governance.
- Best-in-class and environment-friendly digital and physical infrastructure.
- Innovative, dynamic and skilled human resources.

Nau-Anaj (crop)

Economy

Why in news?

- Nekram Sharma, Himachal Pradesh's lone Padma awardee for the year 2023, is credited with reviving the traditional 'Nau-Anaj' intercropping system in the state.

About Nau-Anaj

- Nau Anaj, which literally translates to nine crops, is a natural and chemical-free method that improves the fertility of land and reduces water consumption by about 50 per cent.
- It allows nine crops -a combination of lentils, cereals, vegetables, legumes & creepers, to be grown on the same land.
- Natural farming and intercropping patterns leading to diversification of crops strengthen the soil and gradually increase quality and yield besides cutting down on water usage and input costs.

First Advance Estimates

Economy

Why in news?

- First advanced estimates were released recently .

About the estimates

- National Statistical Office has released the first advance estimates for India's GDP for the year 2020-21.
- The estimates will be based on the growth numbers of the first two quarters of the current fiscal as well as other higher frequency data.
- The data is typically released one month ahead of the presentation of the Union budget.
- Prior to 2017, the first advance estimate used to be released in the last week of January as the budget was presented on 28 February.
- However, since 2017, the data has been released in the first week of January to help the government prepare its budget presented on 1 February.

Global Economic Prospects

Economy

Why in news?

- The World Bank released its latest **Global Economic Prospects**.
- Released **twice** a year, the report examines global economic developments and prospects, with a special focus on emerging market and developing economies.

About the Report

- The World Bank produces the GEP twice a year, in January and June, as part of its in-depth analysis of key global macroeconomic developments and their impact on member countries.
- The GEP provides intelligence in support of achieving development goals and is a trusted resource for member countries, stakeholders, civil organizations and researchers.

Why in news?

- The 17th edition of the 'Pravasi Bharatiya Divas' (PBD) convention was held in Madhya Pradesh's Indore city. Theme of this year's PBD is 'Diaspora: Reliable partners for India's progress in Amrit Kaal'

Pravasi Bharatiya Samman Award

- During the Convention, Pravasi Bharatiya Samman Award (PBSA) is conferred on the selected overseas Indians for their significant contributions to various fields both in India and abroad.
- It is the highest honour, conferred by President, on a Non-Resident Indian (NRI), Person of Indian Origin (PIO); or an organisation or institution established and run by NRI/PIO.

Why in news?

- The Ministry of Communication stated that India will take over the leadership of the Asian Pacific Postal Union (APPU) from January 2023.

Key updates-

- India will take over the chair of the intergovernmental organization and **Dr. Vinaya Prakash Singh, erstwhile Member (Personnel), Postal Services Board will lead India** at the significant forum.
- Dr. Singh will assume the charge of Secretary General of the Union during India's four year tenure there.
- India, for the first time, is leading an international organization in the postal sector.

About the Asian Pacific Postal Union (APPU)-

- Headquartered in Bangkok, Thailand**, APPU is an intergovernmental organisation comprising 32 member countries in the Asia-Pacific region.
- It is the **only restricted union of the Universal Postal Union (UPU) in the region**, which is a specialised agency of the United Nations.
- Also, it is the Secretary General who leads the activities of the Union.
- The secretary here also looks after the **Asian Pacific Postal College (APPC), which is the largest intergovernmental postal training institute in the region.**
- The Union works at forefront in ensuring that all technical and operational projects of the UPU are fulfilled in the region and is integrated into the global postal network in the best possible way.
- Notably, the Union also acts as the regional platform for consultation on key global matters impacting the postal sector.

Why in news?

- NOTAM system failure has disrupted US flights recently.

About NOTAM system

- A NOTAM is a notice containing information essential to personnel concerned with flight operations but not known far enough in advance to be publicized by other means.
- It states the abnormal status of a component of the National Airspace System (NAS) – not the normal status.
- NOTAMs indicate the real-time and abnormal status of the NAS impacting every user.
- NOTAMs concern the establishment, condition, or change of any facility, service, procedure or hazard in the NAS.
- NOTAMs have a unique language using special contractions to make communication more efficient.
- Without NOTAMs, aeroplanes are at a risk of running into flocks of birds or remaining unaware of slippery conditions on runways, for example.
- NOTAMs are listed location wise with pilots needing to check "25 nautical miles to either side of your full route of flight" for relevant NOTAMs.

- The system relays information about changes in conditions such as weather, volcanic activity, airspace restrictions and other factors, as well as unusual events such as parachute jumps, rocket launches and military exercises.
- It also advises pilots of extraordinary situations at airports, including icing, malfunctioning lights and the presence of flocks of birds, reported Simple Flying.
- The US Federal Aviation Administration's (FAA) system, which alerts pilots and other flight personnel about hazards or any changes to airport facility services and relevant procedures, was not processing updated information, the civil aviation regulator's website showed.

UN Blacklists Pakistan's Abdul Rehman Makki

International Relations

Why in news?

- **The UN Security Council's 1267 Al Qaeda Sanctions Committee added** Pakistan-based Abdul Rehman Makki, the deputy chief of the terror outfit Lashkar-e-Taiba and the brother-in-law of Hafiz Saeed, the founder of Lashkar-e-Taiba, **to its list of designated terrorists.**

The 1267 Al Qaeda Sanctions Committee

- The committee is **part of the UN Security Council** and its job is to implement international sanctions against terrorists.
- **The Al Qaeda committee was established as the Al-Qaida and Taliban Sanctions Committee on October 15, 1999**, after Security Council Resolution 1267 designated al-Qaeda and the Taliban as terrorist bodies.
- **Resolution 1267 was adopted under Chapter VII of the United Nations Charter and requires all UN member states** to freeze the assets of, prevent the entry into or transit through their territories by, and prevent the direct or indirect supply, sale and transfer of arms and military equipment to any individual or entity associated with Al-Qaida, Osama bin Laden and/or the Taliban as designated by the Committee.

China's Population drops for first time in 60 years

International Relations

Why in news?

- China's National Bureau of Statistics said that its population fell by roughly 850,000 in 2022, its first drop in six decades, bringing its population to around 1.41 billion at the end of 2022.

India to become most populous in 2023

- **Both India and China, in the 20th century, were similar in terms of key indicators impacting population growth**, such as life expectancy (the number of years a person is expected to live on average), the Crude Death Rate (the number of deaths in a population per 1,000 people) and Total Fertility Rate or TFR (the number of children a woman, on average, is expected to bear in her lifetime).
- In both countries mortality falls with increased education levels, public health and vaccination programmes, access to food and medical care, and provision of safe drinking water and sanitation facilities happened, resulting in a net increase in population for many decades.
- **The replacement rate is the number of children a woman is to have in order to at least replace the present generation in the future.**
- China's TFR, according to its 2020 Census, was 1.3 births per woman — marginally up from the 1.2 in the 2010 and 2000 censuses, but way below the replacement rate of 2.1.
- **While TFR is gradually declining in India too**, more important is the working-age population. Its share in the overall population crossed 50% only in 2007 and will peak at 57% towards the mid-2030s.
- **India, therefore, has a window of opportunity well into the 2040s for reaping its "demographic dividend", like China did from the late 1980s to 2015**, contingent upon the creation of meaningful employment opportunities for a young population.

Why in the news?

- More than 300 intellectuals from India and abroad released the Bhopal Declaration after discussing the G-20 agenda in the two-day meeting of Think-20 under G20 in Bhopal.

About the declaration

- The Bhopal Declaration made an appeal to all the stakeholders to focus more on inclusive development and care for the welfare of every section of society in comparison to GDP, encourage the model of development led by women, bridge the gap between North and South and work together to ensure the health for all.
- The importance of localization in achieving G-20 sustainable development goals has been acknowledged in the Bhopal Declaration.
- Eminent speakers said that triangular cooperation of government, society, and private organizations is necessary to achieve this goal.
- The declaration has emphasized promoting traditional medicine systems like AYUSH and encouraging value-oriented development in infrastructure development.

Why in news?

- Switzerland became the first WTO member to formally submit its acceptance of the WTO's new Agreement on Fisheries Subsidies, paving the way for the historic agreement for ocean sustainability to enter into force.

New Agreement on Fisheries Subsidies

- The agreement was adopted by consensus at the WTO's 12th Ministerial Conference (MC12) held in Geneva on 12-17 June 2022.
- The Agreement sets new binding, multilateral rules to curb harmful subsidies, which are a key factor in the widespread depletion of the world's fish stocks.
- In addition, the Agreement recognizes the needs of developing and least-developed countries (LDCs) and establishes a Fund to provide technical assistance and capacity building to help them implement the Agreement.
- **It prohibits subsidies to illegal, unreported and unregulated (IUU) fishing**, and bans subsidies for fishing overfished stocks and for fishing on the unregulated high seas.
- Members also agreed at MC12 to continue negotiations on outstanding issues, with a view to making recommendations by MC13 for additional provisions that would further enhance the disciplines of the Agreement.
- **Acceptances from two-thirds of WTO members are needed for the Agreement to come into effect.**

Why in news?

- 'SMART' program for Ayurveda professionals to boost R&D in Ayurveda in the country has been launched recently.

About the SMART program

- 'SMART' (Scope for Mainstreaming Ayurveda Research in Teaching Professionals) program aimed to **boost scientific research in priority healthcare research areas** through Ayurveda colleges and hospitals.
- The National Commission for Indian System of Medicine (NCISM) and the Central Council for Research in Ayurvedic Sciences (CCRAS), under the Ministry of Ayush have launched this program.
- The proposed initiative is conceptualised with an objective to identify, support and promote innovative research ideas in healthcare research areas including Osteoarthritis, Iron Deficiency Anaemia, Chronic Bronchitis, Dyslipidemia, Rheumatoid Arthritis, Obesity, Diabetes Mellitus, Psoriasis, Generalised Anxiety Disorder, Non-alcoholic fatty liver disease (NAFLD).
- The eligible Ayurveda academic institutions may apply for this program.

Deep Tech Startups

Science & Technology

Why in news?

- Minister of State for Electronics and IT has said that the government will launch a Digital India Innovation Fund which aims to support deep-tech startups.

About deep-tech startups

- Deep tech or deep technology refers to a class of startup businesses that develop new offerings based on tangible engineering innovation or scientific discoveries and advances.
- Deep technology (deep tech) or hard tech is a classification of organisation, or more typically startup company, with the expressed objective of providing technology solutions based on substantial scientific or engineering challenges.
- Usually, such startups operate on, but are not limited to, agriculture, life sciences, chemistry, aerospace and green energy.

Deep Tech start-ups in India

- India had over 3,000 deep-tech start-ups, dabbling in new-age technologies like Artificial Intelligence, Machine Learning, Internet of Things, Big Data, quantum computing, robotics, etc., at the end of 2021.
- Bengaluru accounts for 25-30 per cent of India's deep-tech start-ups, followed by Delhi-NCR (15-20 per cent) and Mumbai (10-12 per cent).**
- Overall, the share of deep-tech start-ups in India's overall entrepreneurial ecosystem stands at 12 per cent now.

Widefield ASKAP L-band Legacy All-sky Blind Survey

Science & Technology

Why in news?

- WALLABY is helping astronomers build a three-dimensional map of the night sky.

About WALLABY

- It is a radio telescope in Western Australia that is helping astronomers build a three-dimensional map of the night sky, mapping galaxies as far as a billion light years away.
- It is hosted by the Australian Square Kilometer Array Pathfinder (ASKAP) telescope,
- Hundreds of galaxies have been surveyed in Phase 1 of WALLABY**, covering the equivalent area of over 700 full moons.
- Radio astronomy involves tracking the signals from radio waves** and helps detect and trace stellar objects that cannot be traced by light.
- Therefore, barriers posed by cosmic dust are removed and the scale and size of WALLABY means that it will be possible to investigate the universe at a scale impossible with optical telescopes.

- The WALLABY project will provide pictures on where galaxies are actually located in relation to one another in three-dimensional space.
- It will be able to tell apart galaxies that appear clustered together but are actually millions of light years apart.
- The observatory is located at one of the most radio-quiet locations in the world, allowing projects like WALLABY to find narrow and faint astronomical signals without being swamped by radio interference.

Gelbots

Science & Technology

Why in news?

- Researchers from Johns Hopkins University have developed a soft robot made of gel called Gelbot recently.

About the Gelbot

- The 'gelbot', **the robot shrinks or swells depending on the variation in the temperature of its surroundings**. This causes the robot to move in a particular direction without relying on a power source to facilitate its movement.
- This is an object moving without batteries, without wiring, without an external power supply of any kind—just on the swelling and shrinking of gel.
- The gelbot is able to move because of the way its shape, dimensions and patterning of gel are designed. Typically, robots are made almost exclusively of hard materials like metals and plastics, which makes it hard to make more human-like robots, and thus useful for biomedical research.
- Water-based gels, which feel like gummy bears, are believed to be extremely promising materials for soft robotics. They rely on the principle that gels that swell or shrink in response to temperature can be used to create smart structures.
- The swelling and shrinking of gels can be strategically manipulated to move robots forward and backward on flat surfaces, or to have them crawl in certain directions with an undulating, wave-like motion.
- The **gelbots, which are still experimental, are created by 3D printing**. Produced using gelatine, the robot is powered entirely through the alteration of temperature. Fluctuations in temperature, between 30-60 Celsius, can cause the gelbot to either shrink or swell.

Lumpi-ProVac

Science & Technology

Why in news?

- A memorandum of understanding for production of the Goat Pox vaccine and "Lumpi-ProVac" vaccine was signed recently.

About the vaccine

- 'Lumpi-ProVacInd' is safe in animals and induces LSDV-specific antibody-and cell-mediated immune response, besides providing complete protection against lethal LSDV challenge.
- It is used for the prophylactic immunization of animals against Lumpy Skin Disease, which illicit protection for about one year.
- The vaccine is stored at 4°C.
- The vaccine must be shipped on ice and must be used within a few hours after reconstitution.
- National Centre for Veterinary Type Culture, ICAR-NRCE, Hisar in collaboration with ICAR-IVRI, Izatnagar,
- UP has developed a homologous live-attenuated LSD vaccine, named Lumpi-ProVacInd.
- The patent has been filed by the ICAR for the technology.
- Agrinnovate India Limited, the commercial department of Department of Agricultural Research and Education (DARE) under Ministry of Agriculture and Farmers' Welfare granted "Non-Exclusive Rights" for Commercial production of "Lumpi-ProVac", to Institute of Veterinary Biological Products (IVBP) recently.

About Lumpy Skin Disease

- Lumpy skin disease (LSD) is a contagious viral disease of cattle and buffalo that causes relatively low mortality.
- It does not affect humans. The disease can result in animal welfare issues and significant production losses.
- The lumpy skin disease virus (LSDV) is a virus of the capripoxvirus genus in the poxviridae family.
- It is transmitted by insects that feed on blood, like mosquitoes, ticks, and certain species of flies. Lumpy skin disease also spreads through contaminated fodder and water.



- The disease causes fever, nodules on the skin and can be fatal, especially in animals that have never been exposed to the virus.
- The Lumpy Skin Disease has been reported in India from 2019 while the first case was reported in the state of Odisha. After that, it has spread to multiple states in the country.

108th Indian Science Congress

Science & Technology

Why in news?

- The Prime Minister recently addressed the 108th Indian Science Congress (ISC) via video conferencing.

About 108th ISC

- The largest gathering of scientists and students in the country, the Science Congress is an annual five-day event from January 3rd to 7th, a permanent fixture on the Prime Minister's calendar, and usually his/her first public engagement in the new year.
- **The focal theme of 108th ISC is "Science and Technology for Sustainable Development with Women Empowerment".**
- The 108th annual session of ISC was held at Rashtrasant Tukadoji Maharaj Nagpur University, which is also celebrating its centenary this year.
- **With a history dating back to 1914, the Science Congress is a one-of-its-kind event in the country, bringing together scientists and researchers** not just from the premier institutions and laboratories but also science teachers and professors from colleges and universities, and offering a platform for their interaction with students and the general public on matters related to science.
- **The event is organized by the Indian Science Congress Association (ISCA), an independent body functioning with the support of the Department of Science and Technology (DST)** in the central government.
- The salaries of the permanent staff of ISCA are paid by the DST.
- **For organising the Science Congress, the government provides an annual grant**, which has been increased to Rs 5 crore from this year — it used to be Rs 3 crore earlier.
- **Several other government agencies, like the Science and Education Research Board, also make financial contributions** because the event is seen as an effort to promote science.
- Additional resources are raised through sponsorship and fees for renting out exhibition spaces.
- **The government has no role to play in the selection of the panelists or speakers, the papers to be presented, or the subjects to be discussed**

Several other programmes were also organised alongside ISC-

- **Children's Science Congress** is organised to help stimulate scientific interest and temperament among children.
- **Farmer's Science Congress** is organised to provide a platform to improve the bio-economy and attract youth to agriculture.
- **Tribal Science Congress** is organised which is a platform for the scientific display of indigenous ancient knowledge systems and practices, along with focusing on the empowerment of tribal women.

Indian Science Congress (ISC)

- ISC is a one-of-its-kind event in the country which brings together the scientific communities on a platform for their interaction with students and the general public on matters related to science.
- The event is organized by the Indian Science Congress Association (ISCA).
- ISCA is an independent body functioning with the support of the Department of Science and Technology (DST) in the central government.
- Dubbed as the largest gathering of scientists and students in the country, the Science Congress is an annual five-day event from January 3 to 7
- The first session of the Indian Science Congress was held in 1914 at the premises of the Asiatic Society, Calcutta



Why in news?

- Scientists from Institute of Nano Science and Technology (INST) Mohali, an autonomous institute of Department of Science and Technology (DST), have introduced a new electrolyte called (NaBF₄) recently.

About new electrolyte

- A new aqueous electrolyte can help make electrochemical ammonia synthesis more efficient will be useful for industries producing green energy or hydrogen.
- The electrochemical ammonia synthesis is largely limited by the poor solubility of nitrogen (N₂) in the aqueous electrolyte environment as well as the competitive hydrogen evolution reaction.
- The obstacle faced was that reduction of N₂ has actually occurred in the aqueous medium and in an attempt to solve these issues, the "ambient" conditions are mostly overseen.
- Scientists from INST Mohali have introduced a new electrolyte called (NaBF₄), which not only acts as an N₂-carrier in the medium but also works as a full-fledged "co-catalyst" along with active material transition metal-doped nanocarbon (MnN₄) to deliver high yield of ammonia (NH₃) at absolutely ambient experimental conditions.
- The high production rate of NH₃ approached industrial scale and exceeded almost all the standard catalysts in any other electrolyte medium.
- This research is a novel approach to get through the long-standing issues about the solubility of N₂ in aqueous medium and achieve industrial scale production rate of ammonia by NRR at ambient condition.

Lecanemab**Science & Technology****Why in news?**

- The Food and Drug Administration of the USA has approved a new Alzheimer's drug recently.

About the drug

- Lecanemab is a monoclonal antibody that targets a protein called amyloid which builds up on the brain in people with Alzheimer's.
- The antibody is administered intravenously every two weeks in doses determined by a patient's body weight with 10 milligrams given per kilogram.
- The drug modestly slows the pace of cognitive decline early in the disease but also carries risks of swelling and bleeding in the brain.
- The approval of the drug, lecanemab, to be marketed as Leqembi, is likely to generate considerable interest from patients and physicians.
- Eisai, a Japanese pharmaceutical company, led the development and testing of the drug.
- It is partnering with the US company Biogen, maker of the controversial Alzheimer's drug Aduhelm, for its commercialisation and marketing.
- Though lecanemab may slow cognitive decline somewhat, the treatment also carries risks.
- Nearly 13% of those who received lecanemab developed brain swelling compared with about 2% in the group that didn't receive the treatment.
- However, most of these cases were mild to moderate in severity, did not cause symptoms, and typically resolved within four months.

Viologen-unit grafted organic-framework (iVOFm) by IISER**Science & Technology****Why in news?**

- Researchers at Indian Institute of Science Education and Research (IISER), Pune have come up with a custom-designed unique molecular sponge-like material— macro/microporous ionic organic framework, iVOFm — to clean polluted water.

About iVOFm

- It can swiftly clean polluted water by soaking up sinister contaminants.

- In general, commonly utilised sorbent materials often trap these pollutants through ion-exchange strategy to purify water but suffer from poor kinetics and specificity.
- To mitigate this issue, the group prepared a **newly engineered material called viologen-unit grafted organic-framework (iVOFm)**.
- The material employs amalgamation of electrostatics driven ion-exchange combined with nanometer-sized macropores and specific binding sites for the targeted pollutants.
- To develop this unique material, this **team employed a make-and-break strategy to grow a charged porous organic polymer (POP)** as a sponge-like infinite framework on silica nanoparticles that is used as a template.
- Among all the tested pollutants, the new material showed **ultrafast removal of sulfadimethoxine antibiotic** from water almost completely.
- Even in the presence of other co-existing anions such as nitrates, chloride, and bromide, the removal of sulfadimethoxine antibiotic was extremely high within a minute.
- They also found this material to be very selective toward toxic pollutants in presence of co-existing ions present in waste water even at low concentration.
- It can also be used several times to clean contaminated water just like a bath sponge can be utilised to tackle multiple water spills.

Duchenne Muscular Dystrophy

Science & Technology

Why in news?

- Researchers in India are working on developing an affordable treatment for a rare and incurable genetic disorder called Duchenne Muscular Dystrophy (DMD) with over 5 lakh cases in the country.

Key updates

- The Indian Institute of Technology (IIT), Jodhpur has established a research centre for DMD in collaboration with Dystrophy Annihilation Research Trust (DART), Bengaluru and the All India Institute of Medical Sciences (AIIMS) Jodhpur.
- The researchers are working on affordable therapeutics for DMD and enhance the efficacy of Antisense Oligonucleotide (AON)-based therapeutics.

About Duchenne Muscular Dystrophy

- It is a severe type of muscle weakness that usually begins at an early age and worsens quickly.
- **DMD is an X-linked recessive muscular dystrophy affecting roughly one in 3,500 boys**, which causes **gradual loss of muscle tissue** and function eventually leading to wheelchair dependency at around the age of 12 years, requirement for assisted ventilation at around the age of 20 years and eventually premature death.
- **It can begin as early as age 2 or 3, first affecting the proximal muscles** (those close to the core of the body) and **later affecting the distal limb muscles** (those close to the extremities).
- **Currently, there is no cure for DMD**, but improvements in integrative treatment can slow down the disease progression and thereby, extend the life expectancy of DMD patients.
- **Patients with DMD have different forms of mutations at varying positions of the protein**, resulting in the production of functionally compromised dystrophin ORF.
- Usually, the lower external muscles are affected before the upper external muscles. The affected child might have difficulty jumping, running, and walking.
- **Other symptoms include enlargement of calves, a waddling gait**, and lumbar lordosis (an inward curve of the spine).
- **Progressive weakness and scoliosis result in impaired pulmonary function**, which can eventually cause acute respiratory failure.

Why in news?

- The Animation, Visual Effects, Gaming and Comic (AVGC) Task Force has called for a National AVGC-XR Mission with a budget outlay to be created for integrated promotion & growth of the AVGC sector..

About the Task force

- AVGC Task Force was **constituted under the Chairmanship of Secretary, Ministry of I & B, Shri Apurva Chandra**, to help realize the full potential of the AVGC sector in India, with key stakeholders from the Industry and the Government.
- Secretaries of associated union ministries viz. MSDE, Department of Higher Education- MoE, MeITY & DPIIT were members of this Task Force.
- It also included members from State Governments of Karnataka, Maharashtra, Telangana; heads of education bodies such as All India Council of Technical Education, National Council of Educational Research and Training and representatives of industry bodies - MESC, FICCI and CII.
- Four Sub-Task Forces** were constituted for devising strategies of growth through targeted interventions in their respective areas-
 - Industry & Policy.
 - Education.
 - Skilling.
 - Gaming.
- Their recommendations have formed the basis of the consolidated report of the Task Force.

Key recommendation of the task force-

- Domestic Industry Development for Global Access:**
 - A National **AVGC-XR Mission** with a budget outlay to be created for integrated promotion & growth of the AVGC sector.
 - Launch of a '**Create in India**' campaign with exclusive focus on content creation, In India, For India & For World!
 - With a goal to make India the global hub for AVGC, institute **an International AVGC Platform**, along with a Gaming Expo) with focus on FDI, Co-production treaties and Innovation.
 - Establish a National Centre of Excellence (COE) for the AVGC sector** to become an international reference point across Skilling, Education, Industry Development and Research & Innovation for the AVGC sector.
- Developing Talent ecosystem to realize Demographic Dividends:**
 - Leverage NEP to develop creative thinking** with dedicated AVGC course content at school levels, to build foundational skills and to create awareness about AVGC as a career choice.
 - Launch AVGC focused UG/ PG courses** with standard curriculum and globally recognized degrees. Standardize admission tests for AVGC related courses (viz, MECAT by MESC).
 - With an eye on the demand of 20 Lakh skilled professionals in AVGC sector in this decade, augment skilling initiatives for AVGC sector under MESC.
 - Enhance Industry participation to ensure employment opportunities and absorption for students from non-metro cities and NE states.
 - Establish AVGC Accelerators and Innovation hubs in academic institutions**, on lines of Atal Tinkering Labs.
- Enhancing Technology & Financial Viability for Indian AVGC Industry:**
 - Democratize AVGC technologies by promoting subscription-based pricing models for MSME, Start-Ups and institutions.
 - Made in India for AVGC technologies through incentive schemes for R&D and IP creation. Evaluate PLI scheme to incentivize AVGC hardware manufacturers.
 - Enhanced Ease of Doing Business in AVGC sector i.e tax benefits, import duties, curbing piracy, etc.
 - Leverage Start-Up India to provide technical, financial and market access assistance to AVGC entrepreneurs to promote culture of R&D and local IP Creation.
- Raising India's soft power through an Inclusive growth:**
 - Establish a **dedicated Production Fund for domestic content creation** from across India to promote Indian culture & heritage globally. Evaluate Reservation for high-quality indigenous content by broadcasters.

- For an Inclusive India, target skilling and industry outreach for youth in Tier 2 & 3 towns and villages in India. Establish Special incentives for women entrepreneurs in AVGC sector.
- **Promote local Children's channels for raising awareness** on rich culture and history of India among children and youth
- Establish framework to ensure Child Rights Protection in the digital world

Generative AI

Science & Technology

Why in news?

- In the wake of newly released models such as Stable Diffusion and ChatGPT, generative AI has become a 'hot topic' for technologists, investors, policymakers and for society at large.

What is generative AI?

- Generative AI is a cutting-edge technological advancement that utilises machine learning and artificial intelligence to create new forms of media, such as text, audio, video, and animation.
- Generative AI is not a new concept, and machine-learning techniques behind generative AI have evolved over the past decade.
- **A Generative Pretrained Transformer (GPT) is a type of large language model (LLM)** that uses deep learning to generate human-like text.
- **They are called "generative" because they can generate new text based on the input they receive, "pre trained"** because they are trained on a large corpus of text data before being fine-tuned for specific tasks, and "transformers" because they use a transformer based neural network architecture to process input text and generate output text.
- **Generative AI stretches beyond typical natural language processing tasks such as language translation, text summarization** and text generation.
- OpenAI's latest release ChatGPT, which caused a viral sensation and reached a million users in just **Beyond the creative space, generative AI models hold transformative capabilities in complex sciences** such as computer engineering.
- Microsoft-owned GitHub Copilot, which is based on OpenAI's Codex model, suggests code and assists developers in autocompleting their programming tasks and has been quoted as autocompleting up to 40% of developers' code, considerably augmenting the workflow.
- Generative AI has the potential to revolutionize many industries by automating the creation of content and enabling the generation of new ideas and concepts.
- **Generative AI can craft sales, marketing, and brand messaging.** Agencies can generate personalised social media posts, blogs, and marketing text and video copies by providing a text prompt to a **Generative AI service, like ChatGPT.**
- **DALL.E, a generative image generation service, can also generate original imagery to align with the branding.**

Exoplanet(LHS 475 b)

Science & Technology

Why in news?

- The NASA has recently announced that the James Webb Space Telescope has discovered its first new exoplanet(LHS 475 b) which is roughly the same size as Earth.

About the new exoplanet (LHS 475 b)

- Located just 41 light-years away, the planet orbits very close to a red dwarf star and completes a full orbit in just two days.
- So far, most of the discovered exoplanets are similar to Jupiter as Earth-sized planets are much smaller in size and harder to discover with older telescopes.

What are exoplanets?

- Exoplanets are planets that orbit other stars and are beyond our solar system.
- According to NASA, to date, more than 5,000 exoplanets have been discovered. Scientists believe that there are more planets than stars as each star has at least one planet orbiting it.
- Exoplanets come in a host of different sizes. They can be gas giants bigger than Jupiter or as small and rocky as



Earth. They are also known to have different kinds of temperatures — boiling hot to freezing cold.

- Studying exoplanets not only broadens our understanding of other solar systems but also helps us piece together information about our own planetary system and origin.
- In a bid to understand the characteristics of an exoplanet, researchers look for its mass and diameter along with determining if it is solid or gaseous or even has water vapour in the atmosphere.
- Another important element of the study is finding out the distance between an exoplanet and its host star.
- This helps scientists determine if a discovered world is habitable or not. If an exoplanet is too close to the star, it might be too hot to sustain liquid water.
- If it's too far, it might only have frozen water. When a planet is at a distance that enables it to have liquid water, it is said to be in the "Goldilocks zone".

How are exoplanets discovered?

- Discovering exoplanets is quite tough as they are small and hard to spot around their bright host stars.
- **Scientists rely on indirect methods, such as the transit method**, which is measuring the dimming of a star that happens to have a planet pass in front of it.
- As mentioned before, the **newly discovered exoplanet orbits around a red dwarf star**. Such types of stars are the most common and smallest in the universe.
- As they don't radiate much light, it's very tough to detect them with the naked eye from Earth.
- However, as red dwarfs are dimmer than other stars, it is easier to find exoplanets that surround them. Therefore, red dwarfs are a popular target for planet hunting.

Hybrid Immunity

Science & Technology

Why in news?

- According to a new study, individuals with hybrid immunity had the highest magnitude and durability of protection, and may be able to extend the period before booster vaccinations are needed compared to individuals who have never been infected.

What is hybrid immunity?

- Hybrid immunity refers to immunity developed through a combination of SARS-CoV-2 infection and vaccination.
- The World Health Organization defines hybrid immunity as protection in people who've received at least two doses of a Covid vaccine and have been infected with the virus either before or after vaccination.

Key findings of the study

- As per the study, the effectiveness of hybrid immunity against hospital admission or severe disease was 97.4 per cent at 12 months with primary series vaccination and 95.3 per cent at 6 months with the first booster vaccination after the most recent infection or vaccination
- The effectiveness of previous infection against hospital admission or severe disease was 74.6 percent at 12 months.
- The effectiveness of previous infection against reinfection waned to 24.7 percent at 12 months.
- The study reported that all estimates of protection waned within months against reinfection but remained high and sustained for hospital admission or severe disease.

Pantranscriptome

Science & Technology

Why in news?

- Recently, researchers at the University of California, Santa Cruz, have proposed a "**pantranscriptome**," which **combines a transcriptome and a pangenome** a reference that contains genetic material from a cohort of diverse individuals, rather than just a single linear strand.

Key updates-

- Deciphering how and which of an individual's genes switch on and off involves mapping their RNA landscape (the messengers necessary to translate gene signals to proteins) to a standard reference.

- RNA's most commonly recognized function is to translate DNA into proteins, but scientists now understand that the vast majority of RNA does not make proteins, but instead can play roles such as influencing cell structure or regulating genes.
- The entire RNA landscape is known collectively as the transcriptome, and mapping this allows researchers to better understand an individual's gene expression.
- The pantranscriptome-concept builds on the emerging concept of "pangenomics" in the genomics field.
- Using a pangenome allows researchers to compare an individual's genome to that of a genetically diverse cohort of reference sequences all at once, sourced from individuals representing a diversity of biogeographic ancestry.
- This gives the scientists more points of comparison for which to better understand an individual's genomic variation.
- Mapping RNA sequencing data to understand gene expression can be difficult because the RNA sequences are spliced by cellular mechanisms, meaning one set of RNA data can come from non-connected areas of the genome, making it challenging to correctly align them to a reference.
- These splicing sites are not uniform across the human population, but vary between individuals.
- With the new pipeline of open-source tools, the researchers can take the spliced segments of an individual's RNA, map where they align on a pangenome, identify which haplotype the data belongs to, and analyse gene expression.

Immune Imprinting

Science & Technology

Why in news?

- A slew of recent studies has shown that a phenomenon in our bodies, called immune imprinting, might be making these new boosters far less effective than expected.

What do these studies say?

- Recently studies pointed out that bivalent boosters made to counter both the Omicron strains and the original Covid-19 strain — don't generate significantly greater antibody responses than an additional dose of the original mRNA vaccines.
- The observed ineffectiveness of the bivalent or variant-specific boosters might be due to immune imprinting, scientists of both studies concluded.

Immune imprinting

- The phenomenon was first observed in 1947 when scientists noted that in flu patients and termed it an '**original antigenic sin**'.
- Immune imprinting is a tendency of the body to **repeat its immune response** based on the first variant it encountered — through infection or vaccination — when it comes across a newer or slightly different variant of the same pathogen.
- Imprinting acts as a **database for the immune system**, helping it put up a better response to repeat infections.
- After the body is exposed to a virus for the first time, it produces **memory B cells** that circulate in the bloodstream and quickly produce antibodies whenever the same strain of the virus infects again.
- The problem occurs when a similar, not identical, variant of the virus is encountered by the body.
- In such cases, the immune system, rather than generating new B cells, activates memory B cells, which **produce cross-reactive antibodies** that bind to features found in both the old and new strains.
- These cross-reactive antibodies offer some protection but are not as effective as the ones produced by B cells when the body first encountered the original virus.

BharOS

Science & Technology

Why in news?

- Recently, IIT-Madras has developed a new operating system called BharOS which is said to benefit 100 crore smartphone users in India.

About BharOS

- BharOS is an AOSP (Android Open Source Project) based operating system with no Google apps or services.
- It is developed by JandK Operations Private Limited (JandKops), which is a non-profit organization incubated at IIT Madras.

- The good thing about this mobile operating system is that this one comes with **No Default Apps (NDA)**.
- This basically means that users will get most of the storage space, unlike Android.
- With BharOS, one won't be forced to use apps that they may not be familiar with or that they may not trust.
- **One will also be able to receive 'Native Over The Air' (NOTA) updates, similar to Android phones.**
- The developers assert that NOTA updates are automatically downloaded and installed on the device, so users don't need to manually initiate the process.
- Furthermore, the OS will also offer access to trusted apps from organization-specific Private App Store Services (PASS).
- A PASS provides access to a curated list of apps that have been thoroughly vetted and have met certain security and privacy standards of organizations.
- This means users can be confident that the apps they are installing are safe to use and have been

Padma awards in the field of Medicine

Science & Technology

Why in news?

- Several doctors across the country have been conferred the Padma awards recently.

Padma Vibhushan award to Late Dilip Mahalanabis,-

- Late Dilip Mahalanabis, who pioneered the use of ORS, was given the Padma Vibhushan **posthumously**, India's second-highest civilian award.
- Dr Mahalanabis who passed away in 2022 was an Indian pediatrician known for pioneering the use of ORS to treat diarrhoeal diseases.
- He demonstrated the effectiveness of ORS while serving in refugee camps during the 1971 Bangladesh Liberation War.

Padma Shri awards-

- Meanwhile, 7 Doctors across the country have been conferred the Padma Shri, India's 4th highest Civilian honour.
- **Dr Ratan Chandra Kar (Andaman & Nicobar)-**
 - He is a retired Government Doctor from Andamans **working with the Jarawa tribe** who inhabit an island 48 km from North Sentinel.
 - He **treated the Jawaras during the measles epidemic of 1999** and brought them back from the verge of extinction by contributing to an increase in population from 76 to 270.
 - He further closely observed and documented their culture and traditions in **his book called 'The Jarawas of the Andamans'**.
- **Dr Munishwar Chander Dawar (Affordable Healthcare Madhya Pradesh)-**
 - He has been treating underprivileged people for the past 50 years.
 - **He is a retired Indian Army doctor who served in the 1971 war.**
- **Dr Nalini Parthasarathi-**
 - Dr Nalini Parthasarathi selected for Padma Shri for medicine is the only person from Puducherry to be selected.
- **Dr Hanumantha Rao Pasupuleti (Telangana)-**
 - He is an internationally-known specialist in Developmental Paediatrics, Rehabilitation Medicine & Psychology.
 - He is known for his work for Aged, Child welfare, Disability, Health, Training, particularly Mentally Retarded and Physically Disabled and Deaf Children and Adults.
- **Dr Manoranjan Sahu (Uttar Pradesh)-**
 - Former Dean, Ayurved Faculty, IMS, Varanasi - Former Director, AIIA, Delhi is known for **his contributions in the field of Shalya Tantra (Ayurveda).**
- **Dr Gopalsamy Veluchamy (Tamil Nadu)-**
 - He is the former director of the Central Research Institute for Siddha and the Central Council for Research in Ayurveda and Siddha.
- **Dr Ishwar Chander Verma (Delhi)-**
 - Dr IC Verma is currently the head of genetic medicine department at Sri Ganga Ram Hospital, New Delhi.
 - He has been **mentioned in the Limca Book of Records 2003 as a pioneer in genetics in India.**

Why in news?

- Recently, the Union Home Minister has asked the border-guarding forces to use the Vibrant Village Programme (VVP).

About Vibrant Villages Programme (VVP)

- This programme was announced in the Finance Minister's Budget Speech 2022.
- It envisages coverage of border villages on the Northern border having sparse population, limited connectivity and infrastructure, which often get left out from the development gains.
- Convergence of existing schemes is proposed under VVP.
- As it is a new programme, its implementation framework, fund requirement and other modalities are being finalised.

SPRINT Scheme**Security****Why in news?**

- The Indian Navy has signed an agreement with Sagar Defence Engineering Pvt. Ltd for armed autonomous boat swarms under 'SPRINT', an initiative to promote development of niche defence technologies by domestic companies.

About 'SPRINT' scheme

- 'SPRINT' stands for Supporting Pole-vaulting In R&D through Innovations for Defence Excellence (IdeX), Naval Innovation and Indigenisation Organisation (NIIO) and Technology Development Acceleration Cell (TDAC).
- The NIIO, in conjunction with the Defence Innovation Organisation (DIO), aims at inducting at least 75 new indigenous technologies, products into the Indian Navy and this collaborative project is named SPRINT.
- Government had started 'SPRINT Challenges' in July 2022 **aimed at giving a boost to the usage of indigenous technology in the Indian Navy.**

Leopard 2 Tank**Security****Why in news?**

- The Leopard 2 is one of the world's leading battle tanks. Until now, both Ukraine and Russia have used Soviet-era tanks in battle, and the Leopards would offer a big step forward in capability.

About the tank-

- The Leopard 2 is a 3rd generation main battle tank originally developed by Krauss-Maffei in the 1970s for the West German army.
- The tank first entered service in 1979 and succeeded the earlier Leopard 1 as the main battle tank of the West German Army.
- It is used by the militaries of more than a dozen other European nations, as well as by the armies of countries as far apart as Canada and Indonesia.
- It has seen service in conflicts in Afghanistan, Kosovo and Syria.
- The tank, which is **powered by a diesel engine, features night-vision equipment and a laser range finder** that can measure distance to an object, enabling it to better aim at a moving target while traveling over rough terrain.
- Military experts said that the chief advantage of the **Leopard 2 was the quantity that could be sent to Ukraine and the relative ease of repair and logistics.**

Why in news?

- The Indian Navy on Monday commissioned the fifth **diesel-electric** Kalvari-class submarine Vagir.

About INS Vagir-

- It is among the six submarines being built by the Mazagon Dock Shipbuilders Limited (MDL), Mumbai, in collaboration with the French M/s Naval Group under Project 75.
- Four of these submarines have already been commissioned into the Navy and a sixth will be commissioned 2024.
- The latest submarine gets its name from the erstwhile Vagir, a submarine which served the Navy between 1973 and 2001 and undertook numerous operational missions.
- The construction of the new Vagir began in 2009 and it took its maiden sea sortie in February last year.
- Also known as Sand Shark, the submarine was delivered to the Indian Navy in December 2022.
- Vagir represents stealth and fearlessness, as it comes with features like an advanced acoustic absorption technique.
- Vagir will boost the Indian Navy's capability to further India's maritime interests and is capable of undertaking diverse missions including anti-surface warfare, anti-submarine warfare, intelligence gathering, mine laying and surveillance missions.
- The design of the Kalvari-class of submarines is based on the Scorpene class of submarines designed and developed by French defence major Naval Group formerly DCNS and the Spanish state-owned entity Navantia.
- This class of submarines have Diesel Electric transmission systems and these are primarily attack submarines or 'hunter-killer' types which means they are designed to target and sink adversary naval vessels.
- The Kalavari class of submarines have an estimated endurance of approximately 50 days.
- They also have the capability of operating in a wide range of Naval combat including anti-warship and anti-submarine operations, intelligence gathering and surveillance and naval mine laying.
- These submarines are around 220 feet long and have a height of 40 feet and can reach the highest speeds of 11 knots (20 km/h) when surfaced and 20 knots (37 km/h) when submerged
- The modern variants of the Scorpene class of submarines have what is called Air Independent Propulsion (AIP) which enables non-nuclear submarines to operate for a long time without access to surface oxygen.
- The Kalvari class of submarines are capable of launching various types of torpedoes and missiles and are equipped with a range of surveillance and intelligence-gathering mechanisms.

Kalvari-class-

- Vagir is a Kalvari-class submarine, which includes other vessels, such as the INS Kalvari, INS Khanderi, INS Karanj, INS Vela and INS Vagsheer.
- Of these, Kalvari and Khanderi were commissioned in 2017 and 2019, and Vela and Karanj were inducted in 2021.
- Vagir has now been commissioned and Vagsheer was launched in 2022.
- The submarines in the current Kalvari-class take their names from erstwhile decommissioned classes of submarines.
- The now-decommissioned Kalvari and Vela classes were one of the earliest submarines in the post-independence Indian Navy, which belonged to Soviet origin Foxtrot class of vessels.
- In maritime parlance, a class of ships is a group of vessels which have the same make, purpose and displacement.
- The class is generally named after the first vessel in the category. In some cases, a particular class of vessels take their names from an earlier class of vessels which are now decommissioned.
- Like Kalvari – which means Tiger Shark, Vagir has been named after a Sand Fish, a predatory marine species.
- Khanderi has been named after an Island Fort built by Chhatrapati Shivaji, which played a key role in his Navy and Karanj has also been named after an Island located South of Mumbai.



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