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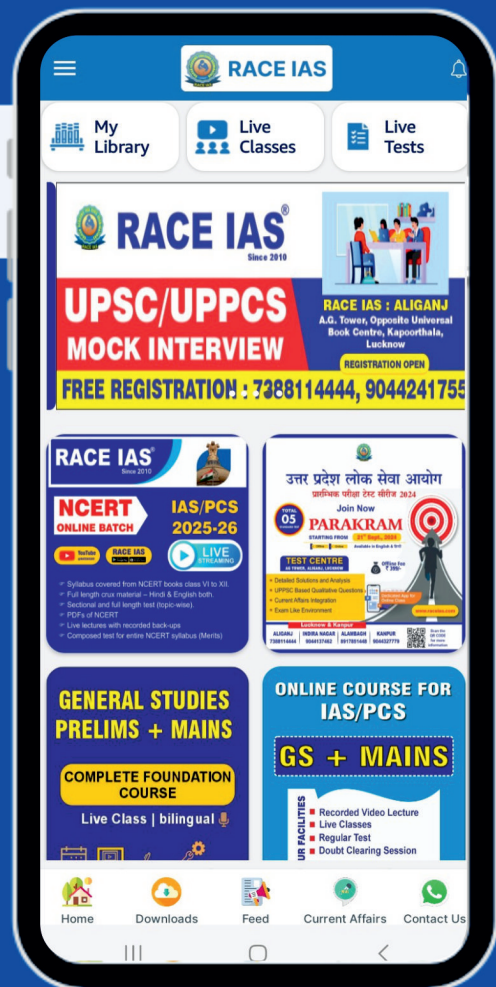
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CURRENT AFFAIRS

HISTORY

Ratnagiri Buddhist Site

Why in the news?

Archaeological Survey of India (ASI) has discovered significant Buddhist remains during renewed excavations at the historic Ratnagiri site in Jajpur district adding another chapter to its 1,200-year-old legacy.

About Ratnagiri Site:

- It is located 100 km northeast of Bhubaneswar, Odisha.
- The site stands on a hill between Birupa and Brahmani rivers and is Odisha's most famous and most excavated Buddhist site.
- It is part of the famous Diamond Triangle of Odisha along with Udaygiri and Lalitgiri, translated as the 'Hills of Jewels'
- Time Period: Experts date Ratnagiri to the 5th and 13th Century, although the peak period of construction is dated between the 7th and 10th centuries.
- It was a center for Mahayana and Tantrayana (also known as Vajrayana) Buddhism.
- There are some studies that suggest that the renowned Chinese Buddhist monk and traveller, Hiuen Tsang visited here during 638-639 AD.
- So far ASI have unearthed a colossal Buddha head, a massive palm, an ancient wall and inscribed Buddhist relics, all of which are estimated to date back 8th and 9th Century AD.

Buddhism in Odisha and links with Southeast Asian countries:

- Mauryan Emperor Ashoka is believed to have invaded Kalinga in 261 BC but, deeply moved by the bloodshed in the war, he eventually embraced Buddhism.
- In Odisha, Buddhism is stated to have particularly flourished under the Bhaumakara dynasty, which ruled parts of the State in between the 8th and 10th Century.
- Odisha has long enjoyed maritime and trade links with Southeast Asian countries. According to historians, pepper, cinnamon, cardamom, silk, camphor, gold, and jewellery were popular items of trade between the ancient kingdom of Kalinga and Southeast Asia.
- The State also annually holds Baliyatra, literally 'voyage to Bali' – a seven-day festival to commemorate the 2,000-year-old maritime and cultural links between Kalinga and Bali and other South and Southeast Asian regions such as Java, Sumatra, Borneo, Burma (Myanmar) and Ceylon (Sri Lanka).

Source: Indian Express

ENVIRONMENT & ECOLOGY

Mammoth

Why in the news?

Researchers in Siberia are conducting tests on a juvenile mammoth whose remarkably well-preserved remains were discovered in thawing permafrost after more than 50,000 years.

About Mammoth:
- Mammoths are members of an extinct species belonging to elephantid genus Mammuthus.
- They lived from the Pliocene epoch (from around 5 million years ago) into the Holocene at about 4,000 years ago.
  They existed in Africa, Europe, Asia, and North America.

Features of the Mammoth :
- The various species of mammoth were commonly equipped with long, curved tusks.
- They evolved a suite of adaptations for arctic life, including morphological traits such as small ears and tails to minimize heat loss, a thick layer of subcutaneous fat, long thick fur, and numerous sebaceous glands for insulation.
- They also had large brown-fat hump-like deposits behind the neck that may have functioned as a heat source and fat reservoir during winter.
- Mammoths are more closely related to living Asian elephants than African elephants.
- IUCN Status: Extinct

Key facts about Permafrost:
- It is any ground—from soil to sediment to rock—that has been frozen continuously for a minimum of two years and as many as hundreds of thousands of years.
- It can extend down beneath the earth's surface from a few feet to more than a mile, covering entire regions, such as the Arctic tundra, or a single, isolated spot, such as a mountaintop of alpine permafrost.
- It can be found on land and below the ocean floor.

Source: India Today

Bald Eagle

Why in the news?

Recently, the Bald eagle was officially declared as the United States national bird after 250 years.

About Bald Eagle:
- The Bald eagle (Haliaeetus leucocephalus) is a magnificent bird of prey found in North America.
- It usually leads a solitary life, gathering in groups during nesting season.
- Appearance:
- Its body and wings are dark brown in color while the head and tail are white.
- The legs and feet are bright yellow and the eyes are light yellow.
- Males of this species are smaller than females.
- Habitat: It typically prefers areas near large water bodies such as sea coasts, coastal estuaries and inland lakes and rivers, in many areas,
- Reproduction: Bald eagles have a monogamous mating system. These birds are believed to mate for life, or until a pair member dies.
- Distribution: Their range extends from the Mexico border through the United States and Canada.
- They can be seen year-round in Alaska, along the East and West coasts, the Rocky Mountains, and the Mississippi River.
- The rest of the United States only sees bald eagles during the winter and their migration.

- Conservation status:
  - IUCN: Least Concern

Source: India Today

Pallas's Cat

Why in the news?

The first photographic proof of Pallas's cat in Himachal Pradesh, India, during a snow leopard survey recently, highlights the urgent need for conservation of lesser-known species in the Indian Himalayas.

About Pallas's Cat:
- The Pallas's cat, or manul (Otocolobus manul), is a small, long-haired cat(family Felidae).
- It was named Pallas's cat after Peter Simon Pallas, who first described it in 1776 based on specimens collected near Lake Baikal, Russia.

Distribution of the Pallas's Cat :
- It is primarily found in Central Asia, with the range extending to western Iran, Mongolia, China, Russia (on the border of Mongolia and China), Kazakhstan, and Kyrgyzstan.
- In these regions, it inhabits mountainous plains and semi-desert foothills.

Features of the Pallas's Cat :
- It is a soft-furred animal about the size of a house cat and is pale silvery gray or light brown in colour.
- Head and body length ranges from 45 to 60 centimetres (18 to 24 inches) with an additional 23–30 cm for the tail; weight ranges from 2.5 to 3.5 kilograms (5.5 to 7.7 pounds).
- It is distinguished by a broad head with high-set eyes and low-set ears.
- The end of its tail is ringed and tipped with black, and some individuals have vague, dark markings on the body.
- The fur of the underparts is about twice as long as that of the upperparts and possibly

represents an adaptation to the cat's habitual lying and crouching on cold ground.

Conservation Status:
- IUCN Red List: Least Concern
- CITES: Appendix II

Source: The Times of India

Brazilian Velvet Ant

Why in the news?

Scientists found that the dark markings on Brazilian Velvet Ant species of fluffy wasp reflected less than 1 percent of light.

About Brazilian Velvet Ant:
- Velvet ants are a group of parasitic wasps that are well known for a suite of defensive adaptations including bright coloration and a formidable sting.
- Appearance: They are wasps, some of which are wingless, and are named in part for their exteriors. Velvet ant is known for its distinct black and white markings.
- Habitat: It is found in a shrub desert in Brazil called the Caatinga.

Characteristics of the Brazilian Velvet Ant :
- It demonstrates remarkable mobility and covers significant distances in pursuit of hosts on the ground.
- It is usually found throughout the day, peak activity typically coincides with the early morning and late afternoon, during periods of subdued sunlight.
- It was recently found that the black parts on female velvet ants were actually ultrablack so that they absorbed nearly all visible light.

Why is this finding Unique?
- Ultrablack pigmentation is rare in the animal kingdom.
- In organisms that have it, it helps them hide from predators, regulate body temperature or even attract mates, as the contrast against brighter colors can be visually enticing.

Source: Indian Express

Black-collared yellow catfish

Why in the news?

Researchers at the Centre for Peninsular Aquatic Genetic Resources, Kochi, of the National Bureau for Fish Genetic Resources (NBFGR) claimed to have developed a captive breeding protocol for black-collared yellow catfish.

About Black-collared yellow catfish:

- It is endemic to the Chalakudy river in Kerala.
- It is characterized by its greenish-brown mottled coloration, shorter barbels, and distinct genetic traits, the species coexists with the endangered Horabagrus Nigricollaris.
- It has been classified as endangered in the International Union for Conservation of Nature (IUCN) Red List.
- The captive breeding programme of the fish began in 2020, and the first generation stock was successfully bred by the researchers.
- The development of the breeding technique will help in the conservation of the species.

National Bureau for Fish Genetic Resources (NBFGR):

- It was established in 1983 in Allahabad (Prayagraj) under the aegis of Indian Council of Agricultural Research.
- It aims to undertake research related to the conservation of fish germplasm resources of the country.
- Its vision is assessment and conservation of fish genetic resources for intellectual property protection, sustainable utilization and posterity.

Source: The Hindu

Common Noctule Bat

Why in the news?

A new study has uncovered the migration strategy of a mammal species called common noctule bat, which travels thousands of kilometres every spring across Europe and uses warm storm fronts to aid their migration and conserve energy while flying.

About Common Noctule Bat:

- The Common noctule (Nyctalus noctula) is an insectivorous bat.
- **Appearance**: Its colors range from golden to dark brown above and usually pale brown below. Their wings are narrow and pointed, and they have a characteristic powerful, direct flight, with repeated steep dives when chasing flying insects.
- Noctules echolocate at low frequencies around 25kHz, just within the upper limit of human hearing, thus they can sometimes be heard, particularly by children.

Habitat of the Common Noctule Bat:

- They generally reside in forests but may forage in open areas and dwell in or near human habitation. Roosting sites include hollow trees, buildings, and caves.
- During winter they hibernate in caves, rock crevices, bat boxes, or blocks of flats in Eastern Europe, where they are the most common hibernating bat species in the cities.
- **Distribution:** They are found in common throughout Europe, most of temperate Asia to Japan and Burma, Oman, Viet Nam, Taiwan and Algeria.

Conservation Status:

- IUCN: Least Concern

Source: The Print

Nitrogen Use Efficiency

Why in the news?

Researchers have demonstrated that reducing nitric oxide (NO) levels in plants can significantly improve nitrogen uptake and Nitrogen Use Efficiency (NUE) in rice and Arabidopsis.

About Nitrogen Use Efficiency:
- It is a term that is used to describe the efficiency of a plant in using applied or fixed nitrogen for biomass production.
- It is further defined as the ratio between crop yield and the amount of nitrogen absorbed from the soil through roots or from the atmosphere through fixation by bacteria.
- NUE is an important trait in crop breeding programs, which aims to improve crop yield while reducing input costs, such as fertilizers, and at the same time keeping nitrogen out of the environment.
- Issues with Traditional methods: They can lead to increased operational costs for farmers and contribute to environmental issues, such as the emission of nitrogen oxides (NOx) during fertilizer production, contributing to global warming.

Highlights of the study:
- The recent study highlights a novel approach to improving NUE by focusing on the systemic regulation of Nitrogen Oxide (NO) levels in plants.
- By modulating these levels, researchers can influence the activity of high-affinity nitrate transporters (HATs), which play a vital role in nitrogen uptake.
- This method diverges from traditional practices, offering a more sustainable solution to enhance crop yields while reducing nitrogen inputs. As the world faces challenges related to food security, this research provides a promising pathway for developing more efficient agricultural practices.

Significance of Nitric oxide (NO):
- It plays a pivotal role in regulating various physiological processes in plants.
- It is involved in the activation of high-affinity nitrate transporters, which are crucial for nitrogen uptake, especially under low nitrogen conditions.

Source: PIB

Neuroptera Species

Why in the news?

Researchers have found two rare Order Neuroptera species, Glenochrysa zeylanica and Indophanes barbara from Kerala.

About Neuroptera:
- It is a group of insects commonly called lacewings because of the complex vein patterns in the wings, giving them a lacy appearance.
- Neuropteran adults are terrestrial and mostly associated with the aerial parts of plants, where they settle or hunt for prey.

Ecological Significance:
- Due to their predatory behaviour, they are used in agriculture.
- The voracious feeding capability, as well as active mobile prey-searching behaviour revealed by the larvae of species particularly of Chrysopidae, Hemerobiidae, and Coniopterygidae makes them active biological control agents of most important pests of agriculture and horticulture.

About Indophanes barbara:
- It is an antlion (a type of insect) belonging to the Myrmeleontidae family.
- The larva of Indophanes barbara does not build pits like common antlion species.
- They live under the surface in loose soils where they are protected from direct sunlight, wind and rain.
- Adults of Indophanes barbara are misidentified as damselflies by non-taxonomists because of their morphological resemblance.
- It can be easily distinguished by their long distinct antennae.
- They come under Order Neuroptera, which includes holometabolous insects while the damselflies come under Order Odonata, which includes hemimetabolous insects

About Glenochrysa zeylanica:
- It is a green lacewing of Chrysopidae family in Order Neuroptera.
- It was rediscovered after 111 years from Mananthavady and Thirunelly in Wayanad district.

- This species, previously thought to be endemic to Sri Lanka, has been rediscovered from the State and reported for the first time from India.

Sydney Funnel-Web Spider

Why in the news?

Recently, Australian scientists have discovered a bigger, more venomous species of the Sydney funnel-web spider.

About Sydney Funnel-Web Spider:
- Scientists have named this 9-centimetre (3.54 inches) long species as Atrax christenseni.
- The new funnel-web species has earned the nickname "Big Boy" and was first discovered in the early 2000s near Newcastle, 170 km (105 miles) north of Sydney.

Characteristics of the Sydney Funnel-Web Spider:
- It is a shiny, dark brown to black spider with finger-like spinnerets (silk-spinning organs) at the end of their abdomen.
- Its venom glands are a lot larger and its fangs are a lot longer.
- Only the male Sydney funnel-web, which carries a much stronger venom, is responsible for human deaths.
- Habitat: They are found in bushy suburban areas, open and closed sclerophyll forests and woodlands, often on south or east-facing slopes or in shady gullies.

About funnel-web spiders:
- These are one of the most dangerous arachnids in the world.
- There are 36 described species of Australian funnel-web spiders and they are currently placed in three genera: Hadronyche, Atrax and Illawarra.

- Their venoms are filled with 40 different toxic proteins.

Lake Naivasha

Why in the news?

Kenya's popular Lake Naivasha is getting impacted by the water hyacinth that has taken over large parts of it.

About Lake Naivasha:
- It is a shallow freshwater lake located in the southern Rift Valley in Kenya.
- It is considered to be of recent geological origin and is ringed by extinct or dormant volcanoes.
- It is fed by the perennial Malewa and Gilgil Rivers, which drain the Aberdare Mountains of central Kenya.
- Flora: Cyperus papyrus, a reed-like swamp vegetation, line much of its shoreline, with variable areas of submerged plants such as Potamogeton species, and floating rafts of the exotic water hyacinth Eichhornia crassipes.
- Fauna: It is supporting a diverse community of waterbirds and many large mammals.
- In addition to the invaluable freshwater, it also supports large-scale and vital economic activities, mainly flower growing, fishing and geothermal power generation.
- It is designated as the Ramsar site.

What is Water hyacinth?
- The water hyacinth is native to South America and was reportedly introduced to Kenya in the 1980s.
- It is known to thrive in the presence of contaminants and grows quickly, and is considered one of the most invasive plant species in the world.
- It can prevent the penetration of sunlight and impact airflow, affecting the quality of aquatic life.

Great Barrier Reef

Why in the news?

Life on the Great Barrier Reef is experiencing significant shifts caused by climate change and various human-generated factors, according to a recent study.

About Great Barrier Reef:
- It is a complex of coral reefs, shoals, and islets in the Pacific Ocean off the northeastern coast of Australia in the Coral Sea.
- It is the longest and largest reef complex in the world and is the largest living structure on Earth.
- It has an area of some 350,000 sq.km. It makes up about 10 percent of the world's coral reef ecosystems.
- The reef, which is large enough to be visible from space, is made up of nearly 3,000 individual reefs.
- These reefs are of two main types - platform reefs formed from radial growths, and wall reefs resulting from elongated growths, often in areas of strong water currents.
- There are also fringing reefs on sub-tidal rock of the main coastline or continental islands.
- It contains 400 types of coral, 1,500 species of fishes, and 4,000 types of mollusks species.
- It also holds great scientific interest as the habitat of species such as the dugong ('sea cow') and the large green turtle, which are threatened with extinction.
- Much of the Great Barrier Reef is a marine protected area, managed by the Great Barrier Reef Marine Park Authority of Australia.
- UNESCO declared the Great Barrier Reef a World Heritage Site in 1981.

Source: Down to earth

Midges

Why in the news?

Researchers from the Zoological Survey of India (ZSI) have identified 23 species of blood-sucking flies (Midges), 13 of them recorded for the first time in the country, in the Andaman and Nicobar Islands.

About Midges:
- These are tiny insects which are similar in appearance to flies but are more closely related to mosquitoes in their feeding habits.
- They belong to the Culicoides genus and are locally called bhusi files.
- Food habit: These flies feed on the blood of livestock such as sheep, goats, and cattle, as well as wild animals like deer.
- Amongst them five species are known to transmit the bluetongue disease virus which is a condition that can be fatal to livestock.
  - Bluetongue disease manifests through symptoms including blue discolouration of the tongue, fever, facial swelling, and excessive salivation.
  - It can potentially lead to death in affected animals and poses a significant threat to livestock farming and the agricultural economy.
- The study, conducted in 2022 and 2023, revealed that 17 of the 23 species identified are known to bite humans, although no human disease transmission has been reported.
- The 13 new species recorded for India are C. barnetti, C. gouldi, C. flaviscutellaris, C. flavipunctatus, C. hui, C. histrio, C. guttifer, C. perornatus, C. okinawensis, C. quatei, C. obscurus, C. coronalis, and C. kusaiensis.
- The Indian Culicoides fauna now includes 93 valid species, many of which are recognised as confirmed or potential vectors of important pathogens of animal health.

Key facts about Culicoides
- Distribution: It is a large genus of the family Ceratopogonidae with cosmopolitan

distribution excluding New Zealand and Antarctica, includes species that are among the smallest haematophagous members of the order Diptera.

- The midges of this family are gaining significant attention due to their role as vectors of almost 60 viruses, 40 protozoans, and 24 filarial nematodes, impacting not only livestock and wildlife but also humans.

<div align="right">

Source: The Hindu

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CLIMATE

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Stellaria Bengalensis

Why in the news?

Researchers from the Centre for Advanced Studies in Botany, North-Eastern Hill University, Shillong discovered a new plant species named Stellaria bengalensis.

About S. Bengalensis:

- It is the annual herb plant of the genus Stellaria (family Caryophyllaceae).
- It was found growing on muddy soil slopes — at altitudes of 2,245-2,450 metres in the Sangser forest, Kalimpong.
- Characteristics:
- It is an annual herb growing to a height of 8 to 10.5 cm, characterized by white flowers, absence of bract, shorter petals (or included within the sepal), sharp and pointed seeds.
- Flowering and fruiting occur during May to September.
- India has around 22 Stellaria species mostly distributed in the Himalayan region.
- The researchers have for the time being assessed the new species as 'data deficient' under International Union for Conservation of Nature (IUCN) criteria.
- Other species Stellaria mcclintockiae, of the same genus, was found on Nelliyampathy Hills of Kerala.

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Source: The Hindu

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Mission Mausam

Why in the news?

The Prime Minister launched 'Mission Mausam' during the 150th foundation day celebration of the India Meteorological Department.

About Mission Mausam:

- It aims to boost India's weather- and climate-related science, research, and services and make India a 'Weather-ready and Climate-smart' nation.
- The ambitious programme, with an outlay of Rs 2,000 crore over two years, will chiefly be implemented by the India Meteorological Department, the Indian Institute of Tropical Meteorology, and the National Centre for Medium-Range Weather Forecasting.
- It will enhance forecasting accuracy, provide near real-time local weather forecasts and research the development of weather management technologies.
- The mission aims to achieve this by developing cutting-edge weather surveillance technologies and systems, implementing high-resolution atmospheric

observations, next-generation radars and satellites, and high-performance computers.

- By leveraging these technologies, the program aims to refine data collection and analysis to improve the spatial and temporal accuracy of forecasting and to help address the challenges posed by climate change.
- It will also focus on improving the understanding of weather and climate processes, and provide air quality data that will help strategize weather management and intervention in the long run.
- It will help to better equip stakeholders, including citizens and last-mile users, in tackling extreme weather events and the impacts of climate change.

About India Meteorological Department (IMD):

- It was established in 1875. It is the National Meteorological Service of the country and the principal government agency in all matters relating to meteorology and allied subjects.
- The Director General of Meteorology is the Head of the IMD.
- There are 6 Regional Meteorological Centres, each under a Deputy Director General with headquarters at Mumbai, Chennai, New Delhi, Calcutta, Nagpur, and Guwahati.
- Its headquarters is in New Delhi.
- At present, IMD is under the Ministry of Earth Sciences (MoES).
- It takes meteorological observations and provides current and forecast meteorological information and statistics for weather-sensitive activities like agriculture, shipping, aviation, offshore oil explorations, etc.

Source: The Times of India

Forever Chemicals

Why in the news?

The European Commission intends to propose a ban on the use of PFAS, or "forever chemicals", in consumer products, with exemptions for essential industrial uses.

About Forever Chemicals:

- Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) are toxic, man-made, hazardous chemicals that have dangerous effects on the environment and health of all organisms including human beings.
- They are called "forever chemicals" because of their tendency to stay in the environment virtually
- PFAs can migrate to the soil, water and air during their production and use.
- These are listed in the Stockholm Convention.
- Applications: They are used in thousands of items, from cosmetics and non-stick pans to aircraft and wind turbines, due to their resistance to extreme temperatures and corrosion.
- Impacts of PFAS on human health: A variety of health risks that are attributed to PFA exposure, including decreased fertility, developmental effects in children, interference with body hormones, increased cholesterol levels and increased risk of some cancers.

Source: The Hindu

GEOGRAPHY & DISASTER

Soapstone

Why in the news?

Recently, the Uttarakhand High Court pulled up the authorities for unregulated soapstone mining in

Bageshwar, a district with more than 160 mines at present.

About Soapstone:
- Also known as Steatite, it is a metamorphic rock made of talc, a naturally occurring mineral.
- It is used in construction and design for countertops, sinks, hearths, and sculptures.
- Depending on the quarry from which it is sourced, this natural stone also contains varying amounts of other minerals such as micas, chlorite, amphiboles, quartz, magnesite, and carbonates.

How Does Soapstone Form?
- Soapstone, most often, forms at convergent plate boundaries where broad areas of Earth's crust are subjected to heat and directed pressure.
- Peridotites, dunites, and serpentinites in this environment can be metamorphosed into soapstone.
- On a smaller scale, soapstone can form where siliceous dolostones are altered by hot, chemically active fluids in a process known as metasomatism.
- Properties: It is a relatively soft, very dense, highly heat-resistant material.
- Major producing countries: China, India, Brazil, USA and Finland
- Major reserves in India: According to the Indian Bureau of Mines, the states of Rajasthan(57%) and Uttarakhand (25%) boast substantial reserves of soapstone in India.

Applications of Soapstone:
- Soapstone in powdered form, often combined with corn starch, is used as baby powder.
- This mineral is used as a thickening agent and lubricant; is an ingredient in ceramics, paint, and roofing material; and is a main ingredient in many cosmetics.
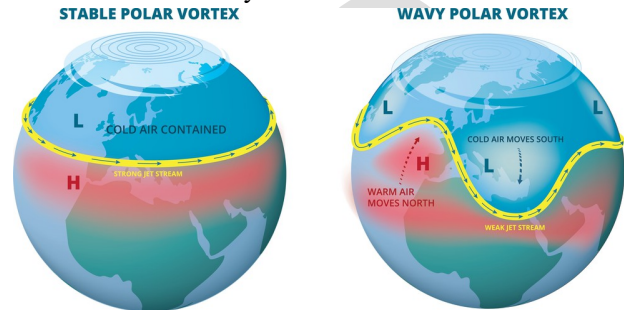
- Talc is used in cosmetics, pharmaceuticals, and other industries.

Source: Indian Express

Polar Vortex

Why in the news?
The plunging polar vortex brought subfreezing temperatures to some of the southernmost points of the United States recently.

About Polar Vortex:
- It is a large area of low pressure and cold air surrounding both of the Earth's poles.
- It extends from the tropopause (the dividing line between the stratosphere and troposphere) through the stratosphere and into the mesosphere.
- It always exists near the poles, but weakens in summer and strengthens in winter.
- The term "vortex" refers to the counterclockwise flow of air that helps keep the colder air near the Poles.
- Many times, during winter in the northern hemisphere, the polar vortex expands, sending cold air southward with the jet stream.
- Jet streams are relatively narrow bands of strong wind in the upper levels of the atmosphere, typically occurring around 30,000 feet (9,100 meters) in elevation.
- It occurs fairly regularly during wintertime and is often associated with large outbreaks of Arctic air in the United States.
- It is not confined to the United States. Portions of Europe and Asia also experience cold surges connected to the polar vortex.
- By itself, the only danger to humans is the magnitude of how cold temperatures will get when the polar vortex expands, sending Arctic air southward into areas that are not typically that cold.
- The Antarctic polar-front jet stream is more uniform and constant than its Arctic

counterpart, because Antarctica is surrounded by ocean rather than a mix of land and water.
- Cold-air outbreaks, however, do occur in the Southern Hemisphere, but they are less frequent and strike heavily populated areas less frequently.

Source: The Hindu

Pink fire retardant

Why in the news?

As multiple wildfires continue to torch Southern California, authorities are using planes to drop a large amount of bright pink fire retardant to curb the blaze.

About pink fire retardant:
- Fire retardant is a mix of chemicals used to extinguish or slow down the spread of fires.
- There are different types of fire retardant but to tackle wildfires in the US, authorities most commonly use Phos-Chek, a brand of fire retardant, which mostly contains an ammonium phosphate-based slurry.
- It is made of salts such as ammonium polyphosphate, which does not evaporate easily like water and stays for longer.
- Colour is usually added to the fire retardant to ensure that firefighters can see it against the landscape.
- This helps them create fire lines around the fire retardant, potentially saving lives and property.

What are the concerns?
- Environmental experts have said that spraying fire retardant using planes is ineffective, expensive and a growing source of pollution for rivers and streams.
- Phos-Chek "is laden with toxic metals, and estimates retardant use has released 850,000 pounds of these chemicals into the environment since 2009.
- These toxic metals include chromium and cadmium which can cause cancer, and kidney

and liver diseases in humans and these toxic metals can kill aquatic life.

Source: Indian Express

National Disaster Response Force

Why in the news?

Recently, the Union Minister of Home Affairs attended the 20th Raising Day ceremony of the National Disaster Response Force (NDRF) in Vijayawada, Andhra Pradesh.

About National Disaster Response Force:
- It was established under Section 44 of the Disaster Management Act, 2005.
- It is aimed at specialized responses to natural and man-made disasters.
- Initially established in 2006 with 8 Battalions, the NDRF has now expanded to 16 Battalions, drawn from the CAPF, viz Border Security Force, Central Reserve Police Force, Central Industrial Security Force, Indo-Tibetan Border Police, Sashastra Seema Bal and Assam Rifles.
- It is a multi-skilled and highly specialist force capable of dealing with all types of natural and man-made disasters like Floods, Cyclone, Earthquakes, Landslides, Building-collapse, Trains and road accidents etc.
- The strategic deployment of NDRF resources, characterized by "proactive availability" and "pre-positioning" during imminent disaster situations, has proven instrumental in mitigating damages caused by natural calamities across the country.
- It has been very active in responding to natural disaster under multilateral and bi-lateral agreement at International level.
- The NDRF teams responded during the triple disaster (Earthquake, Tsunami and Radiation Leakage) of Fukushima, Japan in 2011 and during Earthquake in Nepal in 2015.
- It functions under the purview of the Ministry of Home Affairs (MHA) and is headed by a Director General.

Source: The Hindu

Mount McKinley

Recently, the US President signed an executive order renaming Denali to Mount McKinley.

About Mount McKinley:

- It is the highest peak in North America.
- It is located near the centre of the Alaska Range, with two summits rising above the Denali Fault in south-central Alaska,S.
- The mountain is essentially a giant block of granite that was lifted above Earth's crust during a period of tectonic activity that began about 60 million years ago.
- It rises abruptly some 18,000 feet (5,500 metres) from Denali Fault at its base to the higher, more southerly of its two summits.
- The upper half of the mountain is covered with permanent snowfields that feed many glaciers like Kahiltna Glacier, the Muldrow Glacier, the Peters Glacier, the Ruth Glacier, and the Traleika Glacier.
- It forms the central feature of the Denali National Park and Preserve.

Key facts about the Denali Fault:

- It is located in southern Alaska, and has played a crucial role in shaping Earth's geological history.
- A study reveals that three sites along the Denali Fault were once part of a single geologic feature, symbolizing the final joining of two landmasses millions of years ago.
- Over 483 km of horizontal movement along the fault tore apart this united feature due to millions of years of tectonic activity.
- These three locations once formed a terminal suture zone, indicating the last phase of tectonic plate integration into a larger mass.

Source: Indian Express

Chinar Tree

Why in the news?

The iconic Chinar trees in Kashmir have been geo-tagged and equipped with QR-code for digital protection of the Valley's heritage tree.

About Chinar Tree:

- Scientific name: Platanus orientalis
- It is also known as Oriental plane tree, maple tree and locally it is called Boueen, named after the Hindu goddess Bhavani.
- It is the State tree of the Indian union territory of Jammu and Kashmir.
- It is a large, well spreading deciduous tree growing up to a height of 30 meters and girth of 10 to 15 meters at ground level.
- It takes around 30 to 50 years for the trees to reach their mature height and around 150 years for them to grow to their full size.
- It is the only species of the Platanaceae family found in India and grows throughout the Kashmir valley.
- The tree's leaves change colors with the seasons, transforming from deep green in summer to vibrant shades of red, amber, and yellow in autumn.
- Uses: The tree has several properties - leaves and bark are used as medicine, the wood, known as lace wood, is used for delicate interior furniture and the twigs & roots are used for making dyes.

Geotagging of Chinar:

- Under the geo-tagging process, QR codes are attached to each surveyed tree, recording information about 25 characteristics, including its geographical location, health, age and growing patterns, enabling conservationists to track changes and address risk factors.
- The project, spearheaded by J&K Forest Research Institute (FRI) of J&K Forest Department involves geo-tagging and QR coding of Chinar trees to enable their monitoring and management.
- The geotagging of the majestic Chinars have proved that these trees are much older than

what were claimed to be 700 years old. Some are more than 1000 years old.
Source: The New Indian Express

POLITY & GOVERNANCE

National Green Tribunal (NGT)

Why in the news?
The National Green Tribunal has sought a response from the Central Pollution Control Board and Jaipur's District Magistrate in a matter related to several students getting hospitalised after a suspected gas leak in the Rajasthan capital.

About National Green Tribunal:
- It was established in 2010 under the National Green Tribunal Act, 2010 for effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources.
- It is a specialized body equipped with the necessary expertise to handle environmental disputes involving multi-disciplinary issues.
- The Tribunal shall not be bound by the procedure laid down under the Code of Civil Procedure, 1908, but shall be guided by principles of natural justice.
- The Tribunal is mandated to make and endeavour for disposal of applications or appeals finally within 6 months of filing of the case.

- **Locations:** New Delhi is the Principal Place of Sitting of the Tribunal and Bhopal, Pune, Kolkata and Chennai shall be the other four places of sitting of the Tribunal.
- **Composition of NGT:** The Tribunal comprises:
  - **Chairperson:** A retired Supreme Court judge.
  - **Judicial members:** Retired High Court judges.
  - **Expert members:** Professionals with at least 15 years of experience in fields related to environment or forest conservation.

Source: The Hindu

Panchayat Se Parliament 2.0

Why in the news?
Lok Sabha Speaker is set to inaugurate 'Panchayat Se Parliament 2.0' at the Central Hall of Samvidhan Sadan.

About Panchayat Se Parliament 2.0:
- It will be organised by the National Commission for Women (NCW), in collaboration with the Lok Sabha Secretariat and the Ministry of Tribal Affairs.
- The programme is being organised in commemoration of the 150th birth anniversary of Bhagwan Birsa Munda, the revered tribal leader and freedom fighter.
- It will bring together 502 elected women representatives from Scheduled Tribes across 22 states and Union Territories.

- Its primary focus is to empower these women representatives from Panchayati Raj institutions by enhancing their understanding of constitutional provisions, parliamentary procedures, and governance.
- The programme also aims to recognise the contributions of these representatives in areas such as education and rural development.
- It will include workshops, sessions, and a guided tour of key locations such as the new Parliament House, Samvidhan Sadan, Pradhanmantri Sangrahalaya, and Rashtrapati Bhawan.

- The Lok Sabha Speaker will also lead the delegates in reading the Preamble to the Constitution of India during the event.
- This program builds on the success of the Panchayat Se Parliament 2024 initiative, which engaged 500 women sarpanch from across India.

Source: The Hindu

INTERNATIONAL RELATIONS & ORGANIZATIONS

Silver Notice

Why in the news?
Recently, the International Criminal Police Organisation, or Interpol, has introduced its first 'Silver Notice'.

About Silver Notice:
- It is the latest addition to Interpol's suite of colour-coded alerts, designed to help countries track and retrieve criminally obtained assets.
- This notice allows participating nations to request information on assets linked to criminal activities such as fraud, corruption, drug trafficking, and environmental crimes.
- It aimed at tracing assets laundered across international borders.
- This initiative, part of a pilot project involving 52 countries, including India, was launched following a request from Italy to locate the assets of a senior mafia member.
- The project will run until at least November 2025, with 500 notices available for distribution among the participating countries.

How does it work?

- Countries can use the Silver Notice to request information on various assets, including properties, vehicles, financial accounts, and businesses connected to criminal activities.
- The notice facilitates the identification and location of these assets, enabling further legal action, such as seizure or confiscation, subject to national laws.

India's role in this
- India is a participant in this pilot project and stands to benefit significantly.
- With numerous fugitive economic offenders and a substantial amount of unaccounted black money transferred offshore, the Silver Notice could be instrumental in tracing and recovering these assets.

Source: Business Standard

India-Middle East-Europe Economic Corridor (IMEC)

Why in the news?
Former US President Joe Biden highlighted the potential realization of the India-Middle East-Europe Economic Corridor (IMEC) following the Israel-Hamas ceasefire.
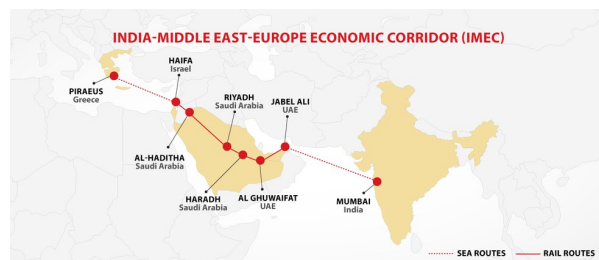
About India-Middle East-Europe Economic Corridor (IMEC):

- It is a connectivity project that seeks to develop a seamless infrastructure of ports, railways, roads, sea lines, and pipelines to enhance trade among India, the Arabian Peninsula, the Mediterranean region, and Europe.
- It was announced in 2023 on the sidelines of the G20 meeting in New Delhi when a memorandum of understanding (MoU) was signed between the European Union and seven countries, namely India, the US, Saudi Arabia, the United Arab Emirates (UAE), France, Germany, and Italy.
- The IMEC will comprise two separate corridors, the eastern corridor connecting India to the Arabian Gulf and the northern corridor connecting the Gulf to Europe.
- Upon completion, the corridor will have a cost-effective and reliable cross-border railway network, which will be supplemented by the available road transport and maritime routes.
- The corridor will include a shipping route connecting Mumbai and Mundra (Gujarat) with the UAE and a rail network connecting the UAE, Saudi Arabia, and Jordan with the Israeli port of Haifa to reach the shores of the Mediterranean Sea.
- Haifa will then be connected by sea to the port of Piraeus in Greece to eventually be connected to Europe.
- In addition, along the corridor, the countries will also lay the network of electricity grids, optical fiber cable for digital connectivity, and pipeline for the transportation of hydrogen gas.
- It intends to increase efficiency, reduce costs, secure regional supply chains, increase trade accessibility, enhance economic cooperation, generate jobs, and lower greenhouse gas emissions.
- The corridor will be supported by the Partnership for Global Infrastructure and Investment (PGII), a US-led initiative to bridge the infrastructure gap in developing countries.

Source: The Economic Times

INDIAN ECONOMY

Dozer Push Mining Method

Why in the news?

The CSIR-Central Institute of Mining and Fuel Research (CSIR-CIMFR) has successfully conducted the first trial blast for the Dozer Push Mining Method, integrating advanced digital technologies, for the first time in India.

About Dozer Push Mining Method:
- It is an unmanned, automated machinery to optimize the mining process which ensures that vibration and flyrock are controlled within safe limits.
- It is an innovative approach developed by CSIR-CIMFR which aims to enhance safety and operational efficiency in mining processes.

Advantages of the Dozer Push Mining Method:
- It offers a viable alternative to the conventional truck-shovel mining technique or shovel-dumper and dragline methods.
- It offers distinct advantages such as improved efficiency by enabling faster coal recovery, reducing delays caused by adverse weather conditions such as the monsoon season and is highly cost-effective, with an estimated 7-10% reduction in operational costs compared to conventional methods.
- Additionally, it enhances productivity by improving the utilization of dragline machines and reducing unit costs.
- Moreover, the unmanned operation of the Dozer Push Mining method greatly enhances worker safety, minimizing the risks associated

with manual labor and traditional mining techniques.

United Nations World Economic Situation and Prospects 2025

Why in the news?

According to the United Nations (UN) flagship report, World Economic Situation and Prospects 2025 Indian economy is expected to grow by 6.6 percent in 2025 and 6.7 percent in 2026.

About United Nations World Economic Situation and Prospects 2025:

- It was produced by the United Nations Department of Economic and Social Affairs (UN DESA), in partnership with UN Trade and Development (UNCTAD) and the five UN regional commissions.

Key points about the report:

- It projects that global growth will remain at 2.8 percent in 2025, unchanged from 2024.
- The report highlighted that capital expenditure on infrastructure development is expected to have strong multiplier effects on growth in the coming years.
- Expansion in the manufacturing and services sectors will continue to drive the economy, while strong export growth in services and certain goods categories, such as pharmaceutical and electronics, will bolster economic activity,
- It also noted that favourable monsoon rains in 2024 have improved summer-sowing areas for all major crops, boosting agricultural output expectations for 2025.
- The UN report said that economic growth in South Asia is expected to remain robust in 2025, primarily driven by strong performance in India. The region is projected to grow at 5.7 per cent in 2025 and 6 per cent in 2026.
- It also highlighted the opportunity for resource-rich developing countries, such as

India, to boost growth, create jobs, and increase public revenues for investment through rising demand for critical minerals.

Amrit Bharat Trains 2.0

Why in the news?

Recently, the Railway Minister announced that the Ministry has introduced 12 significant improvements to the Amrit Bharat Version 2.0 trains.

About Amrit Bharat Trains 2.0:

- Objective: The new trains are designed to cater to low and middle-income families, offering a comfortable experience.
- Under this initiative 50 upgraded trains will be manufactured at the Integral Coach Factory (ICF) over the next 2 years.

Key Features:

○The upgraded trains boast 12 notable enhancements
○Semi-automatic couplers
○Modular toilets
○Ergonomic seats and berths
○Emergency talk-back systems
○Continuous lighting system, similar to Vande Bharat trains
○Advanced pantry car designs
○IoT based water level indicators – Internet based water level indicators to help watering station and on-board staff
○External emergency lights to provide basic lighting during emergency situations like derailments and accidents

- The Amrit Bharat train is a Push Pull Train with LHB (Linke Hofmann Busch). This train has locos at both ends for better acceleration.

- It provides improved facilities for rail passengers like beautiful and attractive designed seats, better luggage rack, mobile charging point with suitable mobile holder, LED lights, CCTV, public information system, among others.
- Its first version was launched in 2024.

Source: Financial Express

Contract Farming

Why in the news?

India has emerged as a major exporter of French Fries, which owes much contract farming through which companies procure potato directly from growers and deepening farmer engagement.

About Contract Farming:
- It is an agreement between farmers (producers) and buyers in which both agree in advance on the terms and conditions for the production and marketing of farm products.
- These conditions usually specify the price to be paid to the farmer, the quantity and quality of the product demanded by the buyer, and the date for delivery to buyers.
- In some cases the contract may also include more detailed information on how the production will be carried out or if inputs such as seeds, fertilizers and technical advice will be provided by the buyer.

Advantages to farmers
- Financial support: Easier access to inputs, services and credit.
- It will help in improved production and management skills.
- Secure market or access new markets.
- It helps in reduction of price-related risks.
- It will generate more stable income and helps in better planning.
- Introduction of new technologies.

Concerns of farmers
- Flexibility issue: Loss of flexibility to sell to alternative buyers when prices increase.
- Possible delays in payments and late delivery of inputs.
- Risk of indebtedness from loans provided by the buyer.
- Impact on environment: It creates environmental risks from growing only one type of crop.
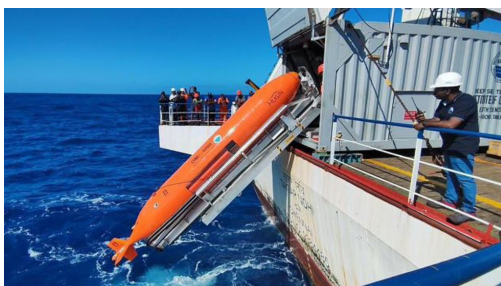- Unequal bargaining power between farmers and buyers.

Source: Indian Express

SCIENCE & TECHNOLOGY

Imaging Active Hydrothermal Vents

Why in the news?

India's Deep Ocean Mission recently achieved a landmark by capturing high-resolution images of an active hydrothermal vent 4,500 meters below the Indian Ocean's surface.

About Hydrothermal Vents:
- Hydrothermal vents are underwater hot springs near tectonic plate boundaries, expelling hot water and minerals from beneath the Earth's crust into the ocean.
- They were first identified in 1977 near the Galapagos Islands, Ecuador.

Formation of the Hydrothermal Vents:
- Cold seawater (around 2°C) seeps through fissures in the oceanic crust near tectonic activity,
- The water then contacts hot magma, heating to temperatures up to 370°C or higher,
- Superheated water then resurfaces as mineral-rich hydrothermal fluids, forming vents and plumes.

Types of the Hydrothermal Vents:
- Black Smokers: Emit particle-laden fluids, primarily containing iron sulfides, forming black chimney-like structures
- White Smokers: Emit fluids rich in barium, calcium, and silicon, forming white chimneys

Significance of the Discovery for India:
- Mineral Exploration: Enhances India's capacity to explore and utilize deep-sea hydrothermal sulfide fields, vital for securing mineral resources.
- Support for Samudrayaan Mission: The findings strengthen India's ambitious Samudrayaan Mission, focusing on mineral extraction from the deep ocean.
- Microbial Research: Offers insights into chemosynthetic organisms, broadening knowledge of deep-sea biology and potential biotechnological applications.

Source: Indian Express

Kaveri Engine

Why in the news?

India's Gas Turbine Research Establishment (GTRE), part of the Defence Research and Development Organisation (DRDO), has announced that the Kaveri engine has been cleared for inflight testing.

About Kaveri Engine:
- The Kaveri engine project began in the late 1980s with the goal of powering the Light Combat Aircraft (LCA) Tejas.
- It has been developed by the Gas Turbine Research Establishment under the Defence Research and Development Organisation.

Features of the Kaveri Engine:
- The current version of the Kaveri engine produces approximately 49-51 kN of thrust.
- This thrust level is suitable for UAV applications like the Ghatak, India's stealth UCAV program. The DRDO plans to integrate

an afterburner to increase the thrust to 73-75 kN for more demanding scenarios.
- The Kaveri engine has undergone extensive ground testing, modifications, and enhancements over the years.
- It has been tested in high-altitude simulations in Russia and ground trials in India. These tests demonstrated promising results in reliability, thrust output, and operational stability, meeting the required performance metrics for inflight testing.
- Significance: This signifies a major step for India's self-reliance in aero-engine technology, particularly for unmanned aerial vehicles (UAVs) like the Ghatak stealth UCAV program.

Source: Economic times

Atomic clock

Why in the news?

A "groundbreaking" atomic clock built at a top-secret UK lab will make military operations more secure through experimental quantum technology over the years.
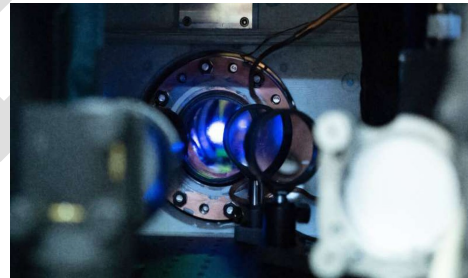
About Atomic clock:
- It is a device that measures time using the vibrations of atoms.
- It specifically uses the oscillations of the electrons in atoms to keep time.
- It is the most accurate time-keeping device available, with a margin of error of just a few billionths of a second per day.
- It is far more precise than conventional clocks because atomic oscillations have a much higher frequency and are much more stable.

Working of Atomic clock :
- Atomic clocks work by using a type of atom called a "cesium atom".
- Cesium atoms are very stable and have a very specific frequency at which their electrons vibrate. This frequency is used as the basis for the atomic clock's timekeeping.

- To measure time using cesium atoms, an atomic clock uses a device called a "microwave cavity". The microwave cavity is a chamber that is filled with cesium vapor.
- A microwave signal is then sent into the cavity, which causes the cesium atoms to vibrate. As the cesium atoms vibrate, they emit radiation at a very specific frequency.
- This frequency is then detected by a detector, which compares it to a standard frequency.
- The difference between the two frequencies is used to adjust the clock's timekeeping.

Applications of Atomic clock:
- GPS systems: GPS systems use atomic clocks to measure the time it takes for a signal to travel from a satellite to a receiver on Earth. This allows GPS systems to calculate the receiver's location with great accuracy.
- Telecommunications networks:Telecommunications networks use atomic clocks to synchronize the timing of signals that are sent over long distances.
- Scientific research:Atomic clocks are used in many scientific experiments that require precise timing, such as studies of the behavior of atoms and molecules.

<div align="center">Source: NDTV</div>

Twigstats

Why in the news?
In a recent study published in Nature, researchers introduced Twigstats, a new time-stratified ancestry analysis, and applied it to ancient whole-genomes from Europe.

About Twigstats:
- It is a time-stratified ancestry analysis tool that boosts the statistical power of existing methods by a magnitude and reduces statistical errors.
- It has determined more precisely than ever individual-level ancestry at a very high resolution.
- It is coded in C++ and employing the statistical language R.

- It allows researchers to focus on a specific period in history with more fine-grained analysis than previously possible.

Techniques used for Genetic analysis:
- Single Nucleotide Polymorphisms (SNPs): This method has been extensively used to reconstruct genetic histories and ancestry models using ancient genetic material (aDNA).
  ○The analysis of SNPs is a powerful technique when the task is to understand populations, but it's restricted by the need for high quality DNA samples and its inability to resolve the histories of groups with closely related ancestors.
- Haplotypes Method: This method captures information from haplotype-sharing or identity-by-descent and a rare variant simultaneously includes time-resolved information about genetic ancestry, and provides comprehensive insights into how individuals 'share' their ancestors.
- Genealogical tree inference method: Researchers have applied this to modern and ancient genomes to understand their population structure, demographics, locations of ancestors, etc.

<div align="center">Source: The Hindu</div>

Genome India project

Why in the news?
The Prime Minister of India lauded the successful completion of the Genome India Project, calling it a historic step in India's research landscape.

About Genome India Project:
- It is a national initiative started in January 2020 to map the genetic diversity of India's population.
- It is a multi-institution consortium project which is supported and funded by the

Department of Biotechnology, Government of India.
- It aims to decode the genetic diversity of India's population through large scale genome sequencing

Objectives of the Genome India Project :
- Create an exhaustive catalog of genetic variations (common, low frequency, rare, single nucleotide polymorphisms, or SNPs, and structural variations) in Indians.
- Create a reference haplotype structure for Indians. This reference panel can be used for imputing missing genetic variation in future studies.
- Design genome-wide arrays for research and diagnostics at an affordable cost.
- Establish a biobank for DNA and plasma collected for future use in research.

Key highlights of the project:
- ○**Genome sequencing of 10,000 individuals:** The project successfully sequenced genomes of 10,074 samples, covering 99 ethnic groups.
- ○**Creation of a genetic database:** Data is securely stored at the Indian Biological Data Centre and will serve as a reference for researchers.
- ○**Genetic insights for public health:** The study revealed unique genetic variations, some with clinical significance, paving the way for precision medicine.
- ○**Phase 1 analysis:** Detailed quality checks and joint genotyping of 5,750 samples have uncovered rare genetic variations unique to Indian populations.
- This 'Genome India' database will now be available to researchers across the world for investigations and is housed at the Indian Biological Data Centre (IBDC), in Faridabad, Haryana.
- Significance: It can help advance the treatment of genetic and infectious diseases.

Source: India Today

Silver Nanowire-Based Conductive ink technology

Why in the news?
In an event held at NIT Warangal, indigenous knowhow of silver nanowire-based conductive ink technology was transferred to two startups.

About Silver Nanowire-Based Conductive ink technology:
- It has been developed under the project funded by the Ministry of Electronics and Information Technology (MeitY), Government of India.
- The indigenous conductive ink technology holds the promise of reducing dependency on other countries, while also enabling India to tap into the rapidly growing demand for advanced electronic materials.
- Silver nanowire-based conductive ink is a versatile material used in:
  ○Flexible electronics (e.g., foldable devices, touchscreen displays, computer keyboards).
  ○Wearable devices and sensors.
  ○Solar panels and display technologies.
  ○RFID tags and windshield defrosters.
- The global market for silver nanowire-based conductive ink and adhesive is projected to surpass $16.87B by 2032 due to a rapid increase in the electronics, semiconductor, solar photovoltaic, and RFID market.
- The market growth can be attributed to key factors, including robust demand from end-use industries.
- India imports ink worth no more than $15,72,000 every year. The United States of America, the People's Republic of China, the Netherlands, the United Kingdom, and Taiwan are the major exporter countries.
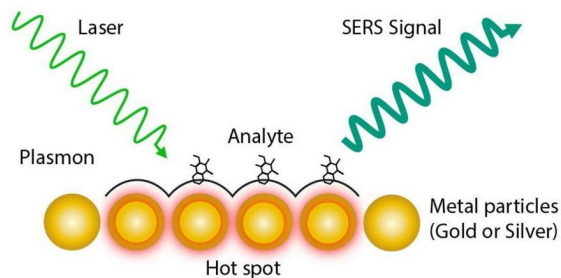
Source: PIB

Surface-Enhanced Raman Spectroscopy
Why in the news?
Recently, researchers have developed an efficient nano catalyst which can be used in environmental remediation, nanoscale electronics, and surface-enhanced Raman spectroscopy (SERS).

Laser | SERS Signal | Plasmon | Analyte | Metal particles (Gold or Silver) | Hot spot

About Surface-Enhanced Raman Spectroscopy:

- Surface-enhanced Raman spectroscopy or surface-enhanced Raman scattering (SERS) is a surface-sensitive technique that enhances Raman scattering by molecules adsorbed on rough metal surfaces.
- It enhances the Raman scattering signals of molecules close to nanostructured metallic surfaces, typically gold or silver.
- It provides the same information that normal Raman spectroscopy does, but with a greatly enhanced signal.
- Applications: It has become a powerful tool in chemical, material and life sciences, owing to its intrinsic features.

What is Raman spectroscopy?

- It is a spectroscopic technique used in condensed matter physics and chemistry to study vibrational, rotational, and other low-frequency modes in a system.
- It depends on the inelastic scattering, or Raman scattering of monochromatic light, usually from a laser in the visible, near-infrared or near-ultraviolet range of electromagnetic spectra.
- It was discovered by the famous Indian physicist C V Raman in 1928.

Source: PIB

Nag Mk 2 Missile

Why in the news?

Recently, Raksha Mantri has congratulated DRDO on successful Field Evaluation Trials of Nag Mk 2 missile.
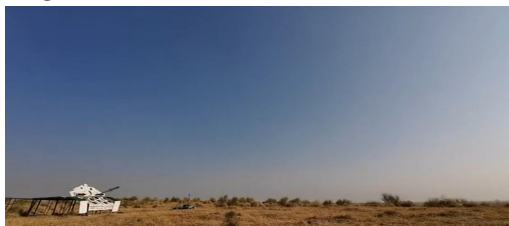
About Nag Mk 2 Missile:

- It is an indigenously-developed third-generation Anti-Tank Fire-and-Forget Guided Missile.
- During the three field trials, the missile systems destroyed precisely all the targets - maximum and minimum range, thus validating its firing range.
- Field Evaluation Trials of this missile were successfully conducted recently at Pokhran Field Range.
- The Nag Missile Carrier version-2 was also field evaluated. With this, the entire weapon system is now ready for induction into the Indian Army.

Features of the Missile:

- Third-Generation Fire-and-Forget Technology: Enables precision targeting with minimal operator intervention post-launch
- Versatile Performance: Capable of neutralising modern armoured vehicles equipped with explosive reactive armour (ERA)
- Platform Compatibility: Successfully integrated with NAMICA, enhancing battlefield mobility and deployment flexibility

Source: PIB

ISRO's Third Launch Pad

Why in the news?

Recently, the Union Cabinet approved the establishment of the Third Launch Pad (TLP) at Satish Dhawan Space Centre of Indian Space Research Organisation (ISRO) at Sriharikota, Andhra Pradesh.

About Third Launch Pad:

- The Third Launch Pad project envisages the establishment of the launch infrastructure at

Sriharikota, Andhra Pradesh for the Next Generation Launch Vehicles of ISRO.
- It is also supported as a standby launch pad for the Second Launch Pad at Sriharikota. This will also enhance the launch capacity for future Indian human spaceflight missions.

Implementation strategy and targets:
- It is designed to have a configuration that is as universal and adaptable as possible that can support not only NGLV but also the LVM3 vehicles with Semicryogenic stage as well as scaled up configurations of NGLV.
- It will be realized with maximum industry participation fully utilizing ISRO's experience in establishing the earlier launch pads and maximally sharing the existing launch complex facilities.
- TLP is targeted to be established within a duration of 48 months or 4 years.
- Funding: The total fund requirement is 3984.86 Crore and includes the establishment of the Launch Pad and the associated facilities.
- Significance: The Project will boost the Indian Space ecosystem by enabling higher launch frequencies and the national capacity to undertake human spaceflight & space exploration missions.

Background of the Launch Pad:
- Presently, Indian Space Transportation Systems are completely reliant on two launch pads viz. First Launch Pad (FLP) & Second Launch Pad (SLP).
- FLP was realized 30 years ago for PSLV and continues to provide launch support for PSLV & SSLV.
- SLP was established primarily for GSLV & LVM3 and also functions as standby for PSLV. SLP has been operational for almost 20 years and has enhanced the launch capacity towards enabling some commercial missions of PSLV/LVM3 along with the national missions including the Chandrayaan-3 mission

Source: PIB

Entity Locker

Why in the news?

The National eGovernance Division (NeGD), under the Ministry of Electronics and Information Technology (MeitY) has developed Entity Locker.
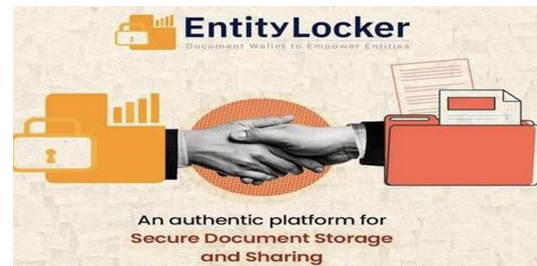
About Entity Locker:
- It is a secure, cloud-based solution that simplifies the storage, sharing, and verification of documents for a wide range of entities, including large organisations, corporations, micro, small, and medium Enterprises (MSMEs), trusts, startups and societies.
- It is designed to transform the management and verification of business/organisation documents.
- The platform is a critical component of India's Digital Public Infrastructure, aligning with the vision of the Union Budget 2024-25 for enhanced digital governance and ease of doing business.
- It is built on a robust technological framework that integrates with multiple government and regulatory systems.
- It provides seamless integration with systems such as the Ministry of Corporate Affairs, the Goods and Services Tax Network (GSTN), the Directorate General of Foreign Trade (DGFT) and other regulatory institutions that provides businesses instant access to critical documents.
- It supports various use cases, including: Vendor verification on the procurement portal, expedited loan applications for MSMEs, FSSAI compliance documentation, vendor verification during registration in GSTN, MCA and tendering process, streamlined corporate annual filings

It offers:
- Real-time access and verification of documents through integration with government databases
- Consent-based mechanisms for secure sharing of sensitive information
- Aadhaar-authenticated role-based access management to ensure accountability
- 10 GB of encrypted cloud storage for secure document management
- Legally valid digital signatures for authenticating documents

Benefits

- Streamlines document sharing and access with partners and stakeholders
- Built-in features simplify adherence to regulations and reporting requirements
- Ensures accountability by tracking all document-related activities
- Consolidates storage and security to reduce administrative overhead
- Minimizes document processing times and operational bottlenecks
- Seamless integration with Government organisations

Source: PIB

Scramjet Engine

Why in the news?

Recently, the Defence Research and Development Organisation (DRDO) has successfully carried out a cutting-edge Active Cooled Scramjet Combustor ground test for 120 seconds for the first time.
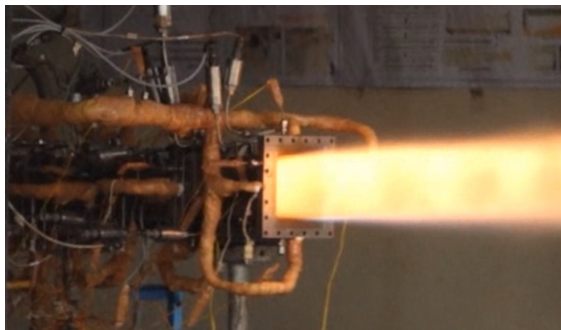
About Scramjet Engine:

- It is an upgraded version of the Ramjet and generates thrust through supersonic air flow and combustion.

- It moves at hypersonic speed and performs best at high speeds, greater than Mach 5.
  - Hypersonic missiles are a class of advanced weaponry that travel at speeds greater than Mach 5 i.e., five times the speed of sound or more than 5,400 km/hr.
  - These advanced weapons have the potential to bypass existing Air Defence Systems and deliver rapid and high-impact strikes.
  - Several nations including the USA, Russia, India and China are actively pursuing Hypersonic technology.
  - The key to hypersonic vehicles is Scramjets, which are air breathing engines capable of sustaining combustion at supersonic speeds without using any moving parts.
- Developed by: Defence Research & Development Laboratory (DRDL), a Hyderabad-based laboratory of Defence Research and Development Organisation (DRDO) has taken the initiative in developing a long-duration Supersonic Combustion Ramjet or Scramjet powered Hypersonic technology.
- Significance: The successful ground test marks a crucial milestone in developing next-generation hypersonic missiles, faster civilian air transportation and facilities for putting satellites into orbit at a low cost.

Source: PIB

HEALTH

Tinnitus

Why in the news?

Researchers at the Indian Institute of Technology (IIT) Bombay have developed an affordable device to diagnose and manage tinnitus.

About Tinnitus:

- It is the perception of sound that does not have an external source, meaning only the affected individual can hear it.
- Causes: It is usually caused by an underlying condition, such as age-related hearing loss, an ear injury or a problem with the circulatory system.

Symptoms of the Tinnitus:

- It can include sleep disturbances, depression, anxiety, irritability, and significant impacts on mental health and social life.
- It can also cause other types of phantom noises in your ears, including: Buzzing, Roaring and Clicking etc.

- Treatment: It may include hearing aids, sound-masking devices, medicines, and ways to learn how to cope with the noise.

**Key facts about the newly developed device:**
- This device, along with its supporting application software, offers a comprehensive approach to managing tinnitus.
- It features precise tinnitus matching, which helps identify the exact nature and frequency of the sound experienced by the patient.
- It provides a customizable, multimodal approach to treatment, ensuring each patient receives a tailored experience suited to their unique condition.
- The software also includes tools for tracking disease progression, enabling clinicians to monitor patient improvement over time.

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Source: India Today

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Melatonin

Why in the news?

Scientists have proved that nano-formulation of Melatonin showed improved antioxidative and neuroprotective properties and could be a potential therapeutic solution for Parkinson's disease (PD).
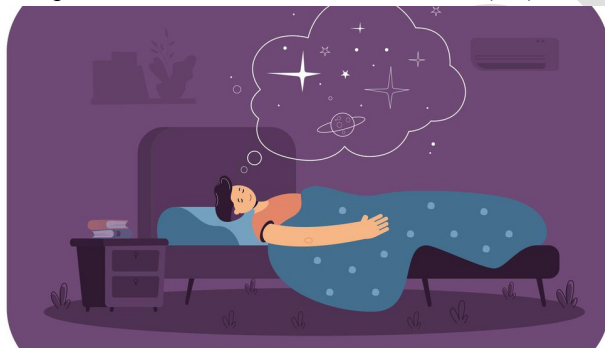
About Melatonin:
- It is a neurohormone secreted from the pineal gland of the brain in response to darkness.
- It is related to the timing and quality of our sleep and wake rhythms and determined by our internal body clock.
- It makes us sleepy at certain times of the day. It starts to secrete when our bodies are getting ready to go to sleep and usually takes about 30 to 45 minutes to take full effect.
- Melatonin secretion is at its highest in the middle of the night and gradually starts to decrease until we are ready to wake up and start our day.

Key facts about Parkinson's disease:

- It is a progressive neurological disorder that affects the nervous system and the parts of the body controlled by the nerves.
- It is a condition in which a patient has limited or no control over his movements and body balance.
- The risk of developing Parkinson's disease naturally increases with age, and the average age at which it starts is 60 years old.
- Many studies have suggested that men are more likely to be affected by Parkinson's than women.

Cause of the Parkinson's disease :
- It is caused by the degeneration of nerve cells in the part of the brain called the substantia nigra, which controls movement.
- These nerve cells die or become impaired, losing the ability to produce an important chemical called dopamine.
- Dopamine operates with other neurotransmitters to help coordinate the millions of nerve and muscle cells involved in the movement.
- Lack of dopamine causes the slowed movements and tremors symptoms of Parkinson's disease.
- Treatment: There's no cure for this disease, but treatments can help significantly improve your symptoms.

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Source: PIB

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Esterase Enzyme

Why in the news?

A team of researchers has successfully used an enzyme esterase enzyme to break down diethyl hexyl phthalate (DEHP) plasticizer.

About Esterase Enzyme:
- It is produced by soil bacteria Sulfobacillus acidophilus.
- The enzyme was structurally characterized using X-ray crystallography.

- It remains active for about a month and catalyzes the degradation of diethyl hexyl phthalate (DEHP) plasticizer with significant efficiency.
- It breaks down the DEHP plasticizer into two products — mono-(2-ethylhexyl) phthalate (MEHP) and 2-ethyl hexanol.
- This esterase enzyme, along with other enzymes identified by their group previously, can convert high molecular weight phthalate plasticizers into water and carbon-dioxide.
- Researchers also found that the esterase enzyme can bind to molecules similar to polypropylene used in plastics, making it a potential tool for extracting polypropylene from contaminated water sources.
- Researchers also found three other enzymes from Comamonas testosteroni bacteria in 2017, that breaks down the phthalates produced by DEHP degradation into carbon-dioxide and water.
- Putting all the enzymes into bacteria will speed up the degradation process.

Mechanism of the Esterase Enzyme:
- ○They used the enzymes in sequence to first break down DEHP to MEHP and 2-ethyl hexanol using esterase enzymes.
- ○MEHP was degraded to phthalate using another enzyme.
- ○The phthalate was then converted to intermediate compounds using a third enzyme (phthalate dioxygenase).
- ○The intermediate compounds are then converted into protocatechuate by the enzyme phthalate decarboxylase.
- ○Once protocatechuate is produced, the tricarboxylic acid cycle of the bacteria, which is common in all bacteria, converts it to carbon-dioxide and water.
- The enzymes, whether used for degradation or not, will remain active only for a short time. But once integrated into bacteria, they remain active for a longer time and the bacteria can be used continuously for degrading the plasticizers.
- But when the enzymes are used without integrating into bacteria, a fresh batch of enzymes needs to be produced to continue the degradation process.

What are Plasticizers?
- These are chemicals added to plastics and personal care products to enhance flexibility and shine, and are commonly found in items such as baby toys, shampoos, soaps, and food containers.
- Plasticizers can be absorbed through the skin, making them a direct threat to human health.

Source: The Hindu

Stargardt Disease

Why in the news?
Researchers from Switzerland say they have developed a gene editing technique that could perhaps help treat Stargardt disease.

About Stargardt Disease:
- It is also known as Stargardt macular degeneration.
- It is commonly caused by changes in a gene, ABCA4. This gene influences how the human body uses Vitamin A.
- It is an inherited disease that leads to progressive vision loss in children and young adults. It is usually bilateral, involving both eyes.
- People with this disease have too much lipofuscin. It builds up over the macula, which is the central part of the retina and is responsible for clear and sharp central vision.
- Everybody's eyes contain a yellowish-brown pigment called lipofuscin that builds up in cells as people age.

Symptoms of the Stargardt Disease:
- The most common symptom of the Stargardt disease is a slow loss of central vision in both eyes. Some people lose their central vision more quickly than others.
- Other symptoms may include Gray, black, or hazy spots in the center of the vision, sensitivity to light and color blindness.

Prevalence of the Disease :

- This disease is observed more commonly in males.
- Its prevalence is estimated at 1 in 8000 to 10000 populations, with deterioration of visual acuity leading to legal blindness and loss of central visual acuity.
- Treatment: There is currently no cure available for the disease.

Source: The Hindu

POPULATION & ASSOCIATED ISSUES

Mannan Community

Why in the news?

Raman Rajamannan, the king of the Mannan community and the only tribal king in Kerala, will participate in the Republic Day parade in Delhi.

About Mannan Community:

- The Mannan is a scheduled tribe (ST) of Kerala.
- It is the only adivasi tribal dynasty with a kingship currently existing in South India.
- The life of the Mannan Community is closely related to the Tamil
  - They speak a dialect similar to Tamil but without a script.
  - It is believed that they were originally from Tamil Nadu and later migrated to Idukki during the period of Poonjar Rajavamsham (kings).
- Nearly 97 percent of the Mannan community's population reside in Idukki District.
- Though they used to stay in remote forests, they were forced to migrate to plots allotted by the government at the outskirts of the Periyar Tiger Reserve, a few decades back, following a government ban on deforestation in the preserved area.
- They follow a matrilineal system of descent, and their ruler, the Raja Mannan, is elected by community headmen from among those eligible by heredity.
- Their primary occupation is agriculture, including coconut harvesting, cultivation of herbs, etc.
- They practice Hinduism.
- Their main celebrations include the Kalavoot, Meenoot and Mutthi Amman Festival.
- Mannan Koothu is a unique ritual art form performed by the Mannans. The art form is staged mainly during worship, harvest times and weddings.

**Source: The Hindu**

BILATERAL, REGIONAL & GLOBAL GROUPINGS

Exercise LA PEROUSE

Why in the news?

The indigenously designed and built guided missile destroyer INS Mumbai is participating in the Exercise LA PEROUSE.

About Exercise LA PEROUSE:

- It is a multilateral maritime exercise that takes place in the Indian Ocean Region.
- It is conducted by the French Navy and held biennially.
- It is the fourth edition of the multinational exercise.
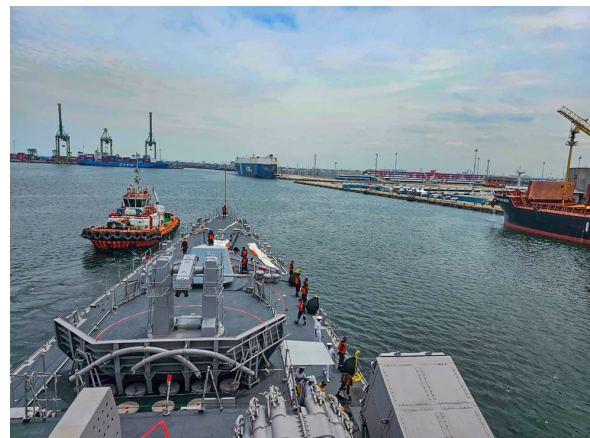
- Participating countries: This edition will witness participation of personnel/surface and

sub-surface assets from various maritime partners including Royal Australian Navy, French Navy, Royal Navy, United States Navy, Indonesian Navy, Royal Malaysian Navy, Republic of Singapore Navy and Royal Canadian Navy.

- It aims to develop common Maritime Situational Awareness by enhancing the cooperation in the field of maritime surveillance, maritime interdiction operations and air operations along with the conduct of progressive training and information sharing.
- The exercise provides an opportunity for like-minded navies to develop closer links in planning, coordination and information sharing for enhanced tactical interoperability.
- The exercise will witness complex and advanced multi-domain exercises including surface warfare, anti-air warfare, air-defence, cross deck landings and tactical manoeuvres,

as also the constabulary missions such as VBSS (Visit, Board, Search and Seizure) operations.

- Participation of the Indian Navy in the exercise showcases the high levels of synergy, coordination and interoperability between the like-minded navies and their commitment to a rules-based international order in the maritime domain.
- This visit is in consonance with India's vision of SAGAR (Security and Growth for All in the Region) to enhance maritime cooperation and collaboration for a safer and secure Indo-Pacific Region.

Source: PIB

ARTS & CULTURE

Sri Ranganathaswamy Temple

Why in the news?
Amid heavy turnout of devotees to Sri Ranganathaswamy temple, residents of the temple town of Srirangam have sought installation of lights on the passages beneath the outer gopurams around the shrine as a safety measure.

About Sri Ranganathaswamy Temple:
- It is a prominent Hindu temple situated at Srirangam near Trichy in Tamil Nadu.
- This temple is the biggest functioning Hindu temple in India.

- Built across an area of 156 acres, this temple is dedicated to Ranganatha, a reclining form of Hindu deity, Lord Vishnu.
- It is the foremost of the eight self-manifested shrines of Lord Vishnu.
- This temple lies on an islet formed by the twin rivers Cauvery and Coleroon.
- Though the temple has existed since the 2nd century BC, the archaeological inscriptions are available only from the 10th century CE.
- This temple underwent many changes during the rule of Cholas, Cheras, Pandiyas, Hoysalas, Vijayanagar kings and Nayak of Madurai.

Architecture of the Sri Ranganathaswamy Temple:
- The entire temple complex is a perfect example of Dravidian architecture.
- Apart from the 7 enclosures with massive walls, the temple complex has 21 very colorful sculpted gopuras, 50 sub-shrines, 9 sacred pools, and a golden Vimana (dome) over the sanctum sanctorum of the presiding deity.
- The vimana over the sanctum of the temple is made up of gold.
- The 236-feet Rajagopura (tower) is the tallest temple tower in India.

- There is also a royal temple tower, which covers a base area of 32,500 sq. ft. and has a height of 196 ft.
- It also comprises a hall containing 1000 pillars. Intricate sculptures are the most attractive part of the hall. The Hall was built during the Vijayanagara period (1336-1565).

<div align="center">Source: The Hindu</div>

<div align="center">INTERNAL SECURITY</div>

Combat Air Teaming System (CATS) Programme

Why in the news?

Recently, the Hindustan Aeronautics Limited (HAL) achieved a significant milestone in its flagship Combat Air Teaming System (CATS) programme with the successful completion of the engine ground run of a full-scale demonstrator, CATS-Warrior loyal wingman.

About Combat Air Teaming System (CATS) Programme:

- It represents a leap in unmanned and manned combat aircraft systems.
- The primary goal is to create advanced aerial platforms that can serve as atmospheric satellites for high-altitude surveillance and conduct autonomous deep-penetration precision strikes from standoff distances, all while minimising risk to life.
- The programme's long-term goals include deep-strike precision, improved battlefield awareness, and secure communications for enhanced operational efficiency.
- To achieve these capabilities, HAL's CATS programme comprises multiple platforms, each tailored for specific roles in combat operations:
  - CATS-Warrior:A stealth UCAV designed to accompany manned fighter jets on missions as a loyal wingman platform. It can carry Smart Anti-Airfield Weapons (SAAWs) and Next-Generation Close Combat Missiles (NG-CCMs) in internal weapon bays to enhance its strike and self-defence capabilities. These drones reportedly possess stealth features, making them difficult for enemy radars and air defence systems to detect. The Warrior drone can execute strikes after penetrating nearly 700 km into enemy territory.
  - CATS-Hunter:Likely to be an air-launched low-observable cruise missile capable of precision strikes deep inside enemy territory. HAL has reportedly indicated that this system will play a role similar to the SCALP missile integrated with the IAF's Rafale jets.
  - ALFA-S Swarm Drones:Released from a carrier pod mounted on the mothership, these swarm drones can perform air-to-ground and air-to-air missions, including neutralising enemy air defence systems. A Tejas aircraft can potentially carry three pods (12 drones), while a Su-30MKI can carry up to four pods (16 drones).
  - CATS-Infinity Pseudo Satellite:The Infinity is an ultra-high-altitude, solar-powered pseudo satellite designed to operate at an altitude of approximately 70,000 feet. With an endurance of 90 days, it bridges the surveillance gap between satellites and UAVs. Equipped with advanced sensors and synthetic aperture radar, its primary role within the HAL CATS programme is to track targets in enemy territory and coordinate missions involving the CATS Warrior. The pseudo satellite can also support 4G and 5G

services, strengthening military communication systems.

- The system envisages the Tejas Light Combat Aircraft (LCA) as the "mothership" controlling a network of autonomous platforms, including the CATS-Warrior, which is a low-observable unmanned combat aerial vehicle (UCAV).

Source: Business Standard

Central Suspect Registry

Why in the news?

Since the launch of the online 'Central suspect registry', the Centre has declined six lakh fraudulent transactions and saved Rs 1,800 crore.

About Central Suspect Registry:

- It is an initiative to strengthen cyber fraud risk management by creating a registry of identifiers.
- It was created based on the National Cybercrime Reporting Portal (NCRP).
- It contains data of 1.4 million cybercriminals linked to financial fraud and various cyber-crimes.
- It has been developed by the Indian Cyber Crime Coordination Centre (I4C), and can be accessed by states and UTs as well as central investigation and intelligence agencies.
- The registry was developed with collaboration from the banks/financial institutions and using it as a central-level database with consolidated data on cybercrime suspects.

What is the Indian Cyber Crime Coordination Centre (I4C)?

- It has been established under the Ministry of Home Affairs (MHA) to deal with cybercrime in the country in a coordinated and comprehensive manner.
- It focuses on tackling issues related to cybercrime for citizens, including improving

coordination between various LEAs and stakeholders.
- The centre is located in New Delhi.

Functions of the Indian Cyber Crime Coordination Centre :

- It acts as a nodal point in the fight against cybercrime.
- It identifies the research problems and needs of LEAs and takes up R&D activities in developing new technologies and forensic tools in collaboration with academia / research institutes within India and abroad.
- It prevents misuse of cyberspace for furthering the cause of extremist and terrorist groups.

Source: Indian Express

Bharat Ranbhoomi Darshan

Why in the news?

Recently, the "Bharat Ranbhoomi Darshan" app was launched by the Defence Minister coinciding with Army Day celebrations.

About Bharat Ranbhoomi Darshan:

- It is developed by the Ministry of Defence in collaboration with the Ministry of Tourism.
- This app opens the doors to India's most iconic battlefields, offering citizens a chance to explore the country's wartime history like never before.
- The move is aimed at promoting connectivity, tourism, and socio-economic development in border regions. The Army is collaborating with local civil authorities to facilitate these efforts while maintaining high operational preparedness.

Features of the app:

- It features details on various battlefields and border areas, offering virtual tours, historical narratives, and interactive content. The sites will also be highlighted by the Tourism Ministry as part of the Incredible India campaign.

- It will be a one-stop destination for the visitors to make all necessary arrangements for their travel planning, including how to apply for permits for some of these places.
- The Indian Army, in conjunction with the Ministry of Tourism, has shortlisted Galwan (the river valley in Ladakh) Doklam which is a tri-junction between India, Bhutan and China and 75 other forward sites alongside the country's border that have witnessed military action in the past for "battlefield tourism.
- Most of these sites fall along India's borders with China (Line of Actual Control) and Pakistan (Line of Control) that have had a history of wars after independence and other

clashes in recent times — the 1962 war with China and the 1967 war, at Nathu La in Sikkim.
- Along the Western border, the Battle of Longewala Was one of the first major engagements during the India-Pakistan war of 1971, fought at the Indian border post of Longewala in the Thar desert.
- These locations, previously restricted due to their strategic significance and challenging terrain, will now offer visitors first-hand insight into the experience of soldiers stationed in these remote regions.

Source: The Hindu

IRRIGATION & IRRIGATION SYSTEMS, FOOD PROCESSING INDUSTRIES

Logistics Ease Across Different States (LEADS) 2024

Why in the news?

Recently, the Union Minister of Commerce & Industry released the "Logistics Ease Across Different States (LEADS) 2024" report in New Delhi.

About Logistics Ease Across Different States (LEADS) 2024:

- It is the 6th edition of the LEADS report.
- It was conceived on the lines of the Logistics Performance Index of World Bank in 2018 by the Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry.
- It evaluates logistics performance across four key pillars: Logistics Infrastructure, Logistics Services, Operating and Regulatory Environment, and the newly introduced Sustainable Logistics.
- It highlights initiatives undertaken by various States and UTs across the identified pillars and also focuses on State/UT-specific opportunities to enable informed decision-making.

Key highlights of LEADS 2024:

Coastal Group

- Achievers: Gujarat, Karnataka, Maharashtra, Odisha, Tamil Nadu
- Fast Movers: Andhra Pradesh, Goa
- Aspirers: Kerala, West Bengal

Landlocked Group

- Achievers: Haryana, Telangana, Uttar Pradesh, Uttarakhand
- Fast Movers: Bihar, Himachal Pradesh, Madhya Pradesh, Punjab, Rajasthan
- Aspirers: Chhattisgarh, Jharkhand

North-Eastern Group

- Achievers: Assam, Arunachal Pradesh
- Fast Movers: Meghalaya, Mizoram, Nagaland, Sikkim, Tripura
- Aspirers: Manipur

Union Territories

- Achievers: Chandigarh, Delhi
- Fast Movers: Dadra and Nagar Haveli and Daman and Diu, Jammu and Kashmir, Lakshadweep, Puducherry
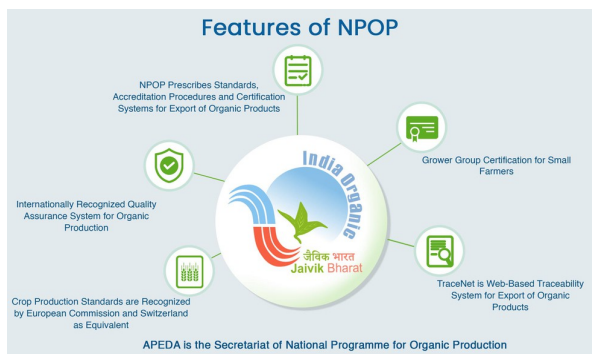- Aspirers: Andaman and Nicobar Islands, Ladakh

Source: PIB

National Programme for Organic Production

Why in the news?

Recently, the Union Minister of Commerce and Industry released the eighth edition of the National Programme for Organic Production (NPOP).

Features of NPOP

About National Programme for Organic Production:

- Launched in 2001, it is a key government programme that laid the foundation of systematic development of the organic agriculture sector in India, through promoting sustainable farming practices and opening new opportunities for farmers and exporters.
- By setting high standards for organic products, NPOP enhances India's competitiveness in the global organic market, while helping farmers adopt eco-friendly and economically viable practices.
- The programme involves the accreditation of Certification Bodies, standards for organic production, promotion of organic farming and marketing etc.
- Implementing agency: The Agricultural and Processed Food Products Export Development Authority (APEDA), Ministry of Commerce & Industries, is implementing this programme.

Highlights of the 8th Edition of NPOP:

- It introduced key amendments aimed at promoting ease of operations and enhancing transparency for stakeholders, including farmers.
- Certification requirements for organic grower groups have been simplified, and these groups are now granted legal status in place of the Internal Control System (ICS).

Many portals launched in this edition:

- NPOP portal:The dedicated portal for the National Programme for Organic Production (NPOP) will provide more visibility and ease of operations for Organic stakeholders.
- Organic Promotion Portal:Farmers, FPOs and exporters can showcase their certified organic products, generate Trade Leads and connect with global buyers. This will also include online Training and capacity building sessions for operators on Organic production and also information on Organic Trade events.
- TraceNet 2.0: The upgraded online Organic traceability system for seamless operations and enhanced tools for regulatory oversight.
- APEDA portal:Redesigned and revamped APEDA portal with enhanced user experience and information for the benefit of Agri and Processed food products' stakeholders.
- AgriXchange portal: Redesigned and revamped AgriXchange portal enables more user-friendly data analysis and generation of reports & data of Agricultural exports making it accessible for the general public.

Source: Business Standard

INFRASTRUCTURE

Global Energy Alliance for People and Planet

Why in the news?

Recently, the Global Energy Alliance for People and Planet (GEAPP) signed a Multi-Donor Trust Fund with International Solar Alliance aiming to mobilize $100 million to fund high-impact solar energy projects.

About Global Energy Alliance for People and Planet:

- It is an alliance of philanthropists, governments, technology, policy, and financing partners.

Global Energy Alliance for People and Planet

- Its mission is to enable emerging and developed economies to shift to a clean energy, pro-growth model that accelerates universal energy access and inclusive economic growth while supporting the global community to meet critical climate goals during the next decade.

- It aims to reduce 4 gigatons of future carbon emissions, expand clean energy access to one billion people, and enable 150 million new jobs.

Initiatives announced by GEAPP:

Multi-Donor Trust Fund:
- GEAPP has strengthened its partnership with International Solar Alliance (ISA) by signing ISA's Multi-Donor Trust Fund which aims to mobilize $100 million to fund high-impact solar energy projects.
- GEAPP, through its Project Management Unit, supports ISA by providing governance oversight, facilitating fundraising efforts, and leveraging its expertise in energy transition planning, financing, and project implementation.

DUET (Digitalization of Utilities for Energy Transition):
- It is a program focused on the digitalization of grid systems through the development of a technology suite in which all grid assets are digitally captured (including geo-coordinates, specifications, etc.) and integrated with live smart sensors for real-time data.
- The system will conduct load flow analysis and real-time tracking of voltage, current, and phase data to reduce transmission and distribution losses.

ENTICE 2.0 (Energy Transitions Innovation Challenge)
- It is a platform designed to identify, nurture, and scale innovative solutions that have the potential to accelerate India's startup ecosystem and help achieve its sustainability goals.
- First launched in 2023, ENTICE aims to help scale innovations for the energy transition by facilitating access to funding, market linkages and mentorship.
- ENTICE 2.0 will kickstart in January 2025, and will go beyond the scope of ENTICE 1.0 by focusing on supporting and scaling investable opportunities.

Source: Financial Express

Anji Khad Bridge

Why in the news?

Indian Railways continues to showcase its engineering excellence with the newly completed Anji Khad Bridge, the country's first cable-stayed rail bridge.

About Anji Khad Bridge:
- It is India's first cable-stayed rail bridge, located in the Reasi district of Jammu and Kashmir.
- A critical component of the ambitious Udhampur-Srinagar-Baramulla Rail Link (USBRL) Project, this engineering marvel connects Katra and Reasi.
- The project's prime focus is on enhancing connectivity between the Kashmir Valley and the rest of India.
- It is constructed over the Anji River, a tributary of the Chenab River.
- Constructed in the challenging Himalayan terrain, the bridge overcame complex geological conditions, including seismic activity and fragile rock formations.
- The Indian Railways collaborated with IIT Roorkee and IIT Delhi for site-specific investigations to ensure the bridge's stability.

Features of the Anji Khad Bridge:
- It is an asymmetrical cable-stayed bridge balanced on the axis of a central pylon.
- Spanning 725.5 metres, the bridge features a 193-metre-tall main pylon, soaring 331 metres above the riverbed.
- Its design allows it to withstand wind speed of up to 213 km/h and safely support train operations at the speed of 100 km/h.
- The bridge comprises four key sections: a 120-metre approach viaduct on the Reasi side, a 38-metre approach bridge on the Katra side, a 473.25-metre cable-stayed segment spanning the valley and a 94.25-metre central embankment connecting the main structure to the viaduct.

Source: Financial Express

Viksit Panchayat Karmayogi Initiative

Why in the news?

Recently, the Union Minister of Personnel, Public Grievances and Pensions launched the 'Viksit Panchayat Karmayogi' initiative on Good Governance Day.

About Viksit Panchayat Karmayogi Initiative:

- It is part of the broader 'Prashasan Gaon Ki Aur' campaign.
- It aims to enhance the capacity and competence of Panchayati Raj Institutions (PRIs) by equipping elected representatives and officials with the tools and knowledge required for effective governance and participatory planning.
- It is currently piloted in Odisha, Assam, Gujarat, and Andhra Pradesh.
- The initiative leverages e-learning platforms, AI-powered chatbots, and mobile apps to bridge knowledge gaps and enhance service delivery.
- This program aligns with the government's broader mission to decentralize governance and foster participatory decision-making at the grassroots level.
- The initiative is expected to create scalable models of citizen-centric governance, enabling PRIs to drive equitable and sustainable development across rural India.

Other initiatives of Viksit Panchayat Karmayogi Initiative:

- New dashboard on the iGOT Karmayogi platform:
  ○ It is designed to empower ministries, departments, and state administrators with advanced tools to monitor user registrations, course completions, and overall progress in capacity-building efforts.
  ○ With customizable views and robust data filtration capabilities, the dashboard provides detailed insights to improve decision-making and optimize training initiatives.

CPGRAMS Annual Report 2024:

- It provides a comprehensive review of the Centralized Public Grievance Redress and Monitoring System.
- The report showcases key achievements, including the resolution of over 25 lakh grievances annually and the implementation of the Grievance Redressal Assessment and Index (GRAI).

Source: PIB

SVAMITVA Scheme

Why in the news?

The Prime Minister of India will distribute over 50 lakh property cards under SVAMITVA Scheme on 27th December.

About SVAMITVA Scheme:

- The Survey of Villages and Mapping with Improvised Technology in Village Areas (SVAMITVA) is a central sector scheme, launched in 2020.
- It was launched with a vision to enhance the economic progress of rural India by providing 'Record of Rights' to households possessing houses in inhabited areas in villages through the latest surveying drone technology.
- The scheme seeks to achieve the following objectives:
- To bring financial stability to the citizens in rural India by enabling them to use their property as a financial asset for taking loans and other financial benefits.
- Creation of accurate land records for rural planning.
- Determination of property tax, which would accrue to the GPs directly in States where it is devolved or else, add to the State exchequer.

- Creation of survey infrastructure and GIS maps that can be leveraged by any department for their use.
- To support the preparation of a better-quality Gram Panchayat Development Plan (GPDP) by making use of GIS maps.
- To reduce property related disputes and legal cases.
- Nodal Ministry: The Ministry of Panchayati Raj (MoPR) is the Nodal Ministry for implementation of the scheme.

PM internship scheme

Why in the news?

The Union Corporate Affairs Ministry said in a release that the pilot scheme of the Prime Minister's Internship Scheme received approximately 6.21 lakh applications against 1.27 lakh opportunities.

About PM internship scheme:
- It is a remarkable initiative launched by the Indian government, designed to provide valuable internship opportunities for the youth of India.
- It aims to bridge the gap between academic learning and real-world experience by offering internships across the top 500 companies.
- The pilot phase targets 1.25 lakh youth, with a five-year goal to facilitate internships for one crore young individuals.
- Through this Scheme, youth will gain exposure to real-life business environments, across varied professions and employment opportunities.
- Under this scheme, interns will be provided monthly financial assistance of Rs 5,000 for 12 months and a one-time grant of Rs 6,000.

Who is eligible for the scheme?
- Candidates aged between 21 and 24 years and who are not engaged in full-time employment.
- Internships are available to those who have passed class 10 or higher.

- Individuals from families with government jobs are excluded.
- It is not open to post-graduates.
- A candidate who graduated from premier institutes such as IIT, IIM, or IISER, and those who have CA, or CMA qualification would not be eligible to apply for this internship.
- Anyone from a household that includes a person who earned an income of Rs.8 lakh or more in 2023-24, will not be eligible.

One Nation One Subscription: Empowering India's Research Ecosystem

Why in the news?

The One Nation One Subscription (ONOS) initiative is a landmark step aimed at democratizing access to global scholarly knowledge in India. It aligns with the broader goals of NEP 2020 and ViksitBharat@2047.
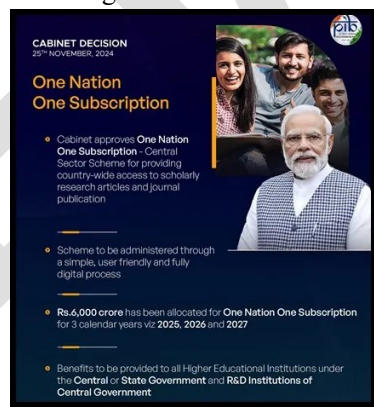
Implementation of ONOS:
- **Role of INFLIBNET:** The Information and Library Network Centre under UGC will centrally manage the subscription and distribution, ensuring seamless digital access to resources. A centralized platform will simplify access and reduce administrative burdens.
- **Funding:** A ₹6,000 crore budget has been allocated for the scheme's first phase (2025–2027).
- **Phase I (2025–2027):** Establish the framework, provide access to research materials, and negotiate Article Processing Charges (APCs) for Indian researchers.

Benefits of the One Nation One Subscription:
- **Democratization of Knowledge:** Provides equitable access to international research resources across tier-2 and tier-3 cities,

addressing regional disparities in research opportunities.

- **Boosts Research Quality:** Access to high-quality journals enhances research capabilities, enabling Indian researchers to contribute to cutting-edge global innovations.
- **Cost Efficiency:** Centralized funding reduces duplication of subscriptions by individual institutions, saving costs for HEIs and research centers.
- Discounts on Article Processing Charges (APCs) make publishing in high-impact journals more accessible.
- **Fosters Collaboration:** Integration with global research communities promotes interdisciplinary and international collaborations, elevating India's global research footprint.
- **Support for National Development:** Enhances India's R&D ecosystem, supporting innovation in critical areas like STEM, medicine, and social sciences, which are pivotal for economic growth and self-reliance.
- **Improved Academic Infrastructure:** Complements initiatives like the Anusandhan National Research Foundation (ANRF), creating a more robust research infrastructure.

Challenges

- **Administrative Complexity:** Coordinating access for 6,300 institutions with diverse needs may pose significant logistical and administrative challenges.
- **Digital Divide:** Effective utilization of digital resources may be hindered by infrastructure gaps in tier-2 and tier-3 cities, such as unreliable internet connectivity or lack of digital literacy.
- **Limited Scope:** The scheme covers only select international journals, and many researchers might still require access to resources not included in Phase I.
- **Sustainability:** Long-term funding for such a large-scale initiative requires careful planning to ensure it remains viable without compromising quality.
- **Monitoring and Evaluation:** Measuring the actual impact of the initiative on research output and innovation can be challenging.
- **Dependency on Global Publishers:** Heavily relying on foreign publishers may limit India's

leverage in negotiations and could lead to higher costs over time.

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Source: PIB

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National e-Governance Awards Scheme

Why in the news?

Recently, the Ministry of Personnel, Public Grievances & Pensions issued the scheme guidelines for the 28th National Awards for e-Governance (NAeG) 2025.

About National e-Governance Awards Scheme:

- It is recognized amongst the most competitive and prestigious digital governance awards schemes in the country.
- The objective of the Scheme is to recognize and promote excellence in implementation of e-Governance initiatives.
- The NAeG Awards, 2025 will consist of Trophy, Certificate and an incentive of Rs 10 lakh for Gold Awardees and Rs 5 Lakhs for Silver Awardees to be awarded to the district/organization for being utilized for implementation of project/programme or bridging resources gaps in any area of public welfare.
- This year 16 Awards are being conferred under the NAeG 2025. Of these 10 will be Gold Awards and 6 will be silver Awards.
- For the year 2025, there are six categories under which the National Awards for e-Governance 2026 will be conferred:
  ○ Government Process Re-engineering by use of technology for Digital Transformation
  ○ Innovation by Use of AI and other new age technologies for providing Citizen-Centric Services,
  ○ Best e-Governance Practices/Innovation in Cyber Security
  ○ Grassroot Level Initiatives for Deepening/ Widening of Service Delivery with focus on initiatives by Districts/ULBs/Gram Panchayats
  ○ Replication and Scaling up of Successful National Awarded Projects like NAeG, Prime Minister Awards in Excellence, Awards

conferred by other Central Ministries by State/UT/ District The NAeG 2024
○ Digital transformation by use of data analytics in digital platforms by Central Ministries/States/UTs
- Nodal Ministry: Ministry of Personnel, Public Grievances & Pensions

Source: PIB

Rural Community Immigration Class (RCIC) Scheme

Why in the news?
Recently, Canada announced that the Post-Graduate Work Permits (PGWPs) of nearly 7.66 lakh international students are set to expire by the end of next year and the Rural Community Immigration Class (RCIC) scheme provides a pathway for foreign nationals and students.

About Rural Community Immigration Class Scheme:
- It is a new programme launched by Immigration, Refugees and Citizenship Canada (IRCC) in December 2024.
- It aims to address labour shortages and promote development in smaller rural communities by attracting individuals willing to settle long-term in these areas.

Eligibility of the Rural Community Immigration Class Scheme:
- Education Level: Applicants can include those with 10+2, graduation, or secondary school qualifications.
- Studies: Students who have completed at least 18 months of study in one of the designated communities are eligible to apply for PR directly. Those who studied outside these communities can also apply but must meet additional conditions.
- Job Offer: Applicants need a job offer letter from a registered or designated employer in the community. This job offer can be in any

category, including non-skilled roles. The offer must be submitted to the community, which will then issue a certificate supporting the PR application.
- Work Experience: Relevant work experience is typically required, though this condition may be waived for international graduates who meet certain criteria.
- Language Proficiency: Applicants must meet the Canadian Language Benchmark (CLB) requirements based on the job's NOC TEER (National Occupational Classification Training, Education, Experience, and Responsibilities) level: TEER 0-1: CLB 6,TEER 2-3: CLB 5 and TEER 4-5: CLB 4
- Financial Proof: Applicants must demonstrate they have at least half of the low-income threshold for rural areas (as determined by Statistics Canada) to sustain themselves for one year.
- Intent to Reside: Candidates must provide genuine proof of their intention to live in the designated rural community.

Source: Indian Express

State Bank of India's (SBI's) Two New Deposit Schemes

Why in the news?
The State Bank of India recently launched two new deposit schemes namely, Har Ghar Lakhpati and SBI Patrons, designed to provide customers with greater financial flexibility and enhanced value.

About Har Ghar Lakhpati Scheme:
- It is a pre-calculated recurring deposit scheme designed to help customers to accumulate Rs 1 lakh or multiples thereof.
- The new scheme simplifies the process of achieving financial goals, allowing customers to plan and save effectively.

- This product is also available to minors, encouraging early financial planning and savings habits.
- The minimum tenure of recurring deposits is 12 months (one year), and the maximum is 120 months (10 years).

About SBI Patrons Scheme:
- This is a specialized fixed deposit scheme tailored for senior citizens aged 80 years and above.
- It offers enhanced interest rates, recognizing the long-standing relationship many senior customers have with the bank.
- SBI Patrons is available to existing and new term deposit customers.
- SBI Patron's depositors would earn an additional 10 basis points higher interest rate than what is offered to senior citizens.

Source: Live Mint

Baanknet Portal

Why in the news?

The government recently launched a revamped e-auction portal, 'Baanknet,' in Delhi.

About Baanknet Portal:
- It is an e-auction portal that consolidates information on all properties that are put up for e-auction by public sector banks (PSBs).
- The portal is a one-stop destination for buyers and investors offering a wide range of properties.
- The listings on the new platform include residential properties such as flats, independent houses, and open plots, as well as commercial properties, industrial land and buildings, shops, vehicles, plant and machinery, and agricultural and non-agricultural land.
- By gathering all these details in one place, the portal simplifies the process of finding and participating in property e-auctions, making it easier for buyers and investors to identify valuable opportunities.
- It significantly aids the recovery process of public sector banks (PSBs), thereby improving the balance sheet of banks and enhancing credit availability to businesses and individuals.
- More than 122,500 properties have already been migrated to the new portal for auction.

Features of the Baanknet Portal:
- The new portal is equipped with improved and enhanced features, including frictionless user journeys where the portal will have the entire pre-auction, auction, and post-auction journeys in a single application.
- It includes an automated and integrated payment gateway alongside KYC tools, all built on a microservices-based architecture that allows for third-party integration through open application programming interface (API).
- Users can benefit from a dashboard feature for easy access to 'Spend Analytics' and various 'Management Information System (MIS) Reports' at the click of a button.
- Additionally, a dedicated helpdesk and call centre facility with a callback request option ensures customer support.

Source: Live Mint

KM3NeT Project

Why in the news?

Scientists are deploying two telescopes which are part of the Cubic Kilometre Neutrino Telescope or KM3NeT to detect high-energy neutrinos, also known as ghost particles, under the Mediterranean Sea.
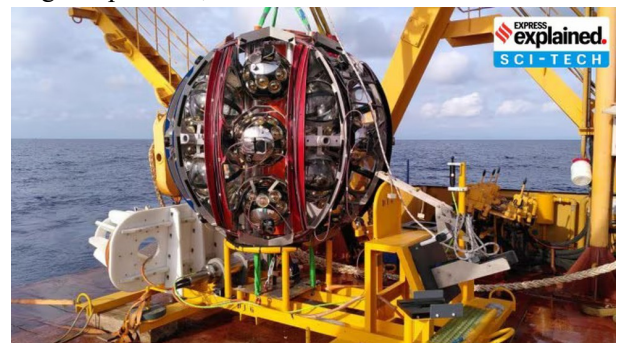
About KM3NeT Project:
- It is a research infrastructure housing the next generation neutrino telescopes with a volume of at least one cubic kilometre.

- It uses Cherenkov radiation (light that neutrinos produce when they interact with a water or ice molecule) to study neutrinos.
- As a European research infrastructure, it is located in the Mediterranean Sea and involves collaboration among multiple countries.

Key components:
- ○ARCA (Astroparticle Research with Cosmics in the Abyss): It will help scientists in searching neutrinos from distant astrophysical sources such as supernovae, gamma ray bursters or colliding stars. It is located offshore Sicily, Italy.
- ○ORCA (Oscillation Research with Cosmics in the Abyss): This telescope is the instrument for KM3NeT scientists studying neutrino properties exploiting neutrinos generated in the Earth's atmosphere. It is located offshore of France.
- ○These telescopes are much like the IceCube Neutrino Observatory, which can detect high-energy neutrinos from deep space but is under the frozen ice in the Antarctic rather than being in the water.
- Arrays of thousands of optical sensors will detect the faint light in the deep sea from charged particles originating from collisions of the neutrinos and the Earth.

What is the IceCube Neutrino Observatory?
- It is a device located at the Earth's South Pole that detects subatomic particles called neutrinos. Built and maintained by the IceCube Collaboration, it consists of approximately 350 physicists from 58 institutions across 14 countries, led by the University of Wisconsin–Madison.
- IceCube collaborators address several big questions in physics, like the nature of dark matter and the properties of the neutrino itself.

Source: Indian Express

Production Linked Incentive Scheme 1.1

Why in the news?

Recently, the union Minister of Steel and Heavy Industries launched the second round of the PLI scheme for Specialty Steel, termed as PLI Scheme 1.1.

About Production Linked Incentive Scheme 1.1:
- It will be implemented during the production period of FY 2025-26 to FY 2029-30.

- It covers five (5) product categories in line with the existing PLI Scheme, namely Coated / Plated Steel Products, High Strength / Wear resistant Steel, Specialty Rails, Alloy Steel Products & Steel wires and Electrical Steel.
- ○These products have a wide range of applications, from white goods to transformers to Automobiles and other niche sectors.

Changes in scheme:
- ○Reduction in threshold investment & capacity for the Cold-Rolled Grain-Oriented (CRGO) product sub-categories, allowing carry forward of excess production to the immediately following year for the purpose of claiming incentive and reduction in threshold investment under capacity augmentation mode.
- ○Not all companies would need to install new mills.
- ○Recognising the importance of producing quality steel, energy efficiency and other process improvements, companies investing in augmentation of existing capacities will be allowed to participate in the scheme.
- The Centre had earlier introduced the PLI scheme to encourage domestic production of specialty steel and lower imports by drawing in capital investments.
- It was initially launched for three sectors to address the need to boost domestic manufacturing during COVID-19 lockdown; the PLI scheme was later extended to include steel in November 2020.

About Cold-Rolled Grain-Oriented (CRGO) grade steel:
- It is a high-value steel used in production of power transformers used in HT power distribution. The technology to make CRGO is not available with any of the Indian steelmakers.

Source: PIB

BHARATPOL Portal

Why in the news?

Union Home Minister and Minister of Cooperation will launch BHARATPOL portal in New Delhi on 07th January, 2025 in Bharat Mandapam.

About BHARATPOL Portal:

- It will streamline the processing of all requests for international assistance through INTERPOL, including the issuance of Red Notices and other colour-coded INTERPOL notices.
- It will become a transformative tool for field-level police officers, enhancing their efficiency in dealing with crimes and security challenges. By facilitating easier and faster access to international assistance, it will strengthen India's efforts in combating transnational crimes.
- It will significantly facilitate Indian Law Enforcement Agencies (LEAs) enabling real-time information sharing for faster access to international police assistance.
- It will be developed by the Central Bureau of Investigation (CBI).

Key facts about Central Bureau of Investigation:

- It is the premier investigative agency in India, with a dual responsibility to investigate grievous cases and provide leadership and direction in fighting corruption to the police force across the country.
- It was established on recommendation of the Santhanam Committee on Prevention of Corruption (1962–1964).
- It is not a statutory body, as it was set up by a resolution (1963) of the Ministry of Home Affairs.
- It acts as the National Central Bureau (NCB-New Delhi) for INTERPOL in India.

- It facilitates international cooperation in criminal matters in collaboration with various agencies across the country, including law enforcement agencies.
- At the Central, State, and Union Territory levels, this coordination is executed through INTERPOL Liaison Officers (ILOs), who are further linked to Unit Officers (UO's) at the level of Superintendents of Police, Commissioners of Police and Branch Heads, within their respective organizations.
- Presently, communications among the CBI, ILOs, and UOs primarily relies on letters, emails and faxes.

Source: PIB

Unnat Jyoti by Affordable LEDs for All (UJALA) Scheme

Why in the news?

The Unnat Jyoti by Affordable LEDs for All (UJALA) scheme, launched in 2015, has completed a decade with the distribution of 36.87 crore LED bulbs, resulting in ₹19,153 crore in annual electricity savings, according to official data released by the Ministry of Power.

About UJALA Scheme:

- In 2015, the Indian government introduced the UJALA scheme, which is also known as the LED-based Domestic Efficient Lighting Programme (DELP), to promote energy efficiency in all households.
- The UJALA scheme is the world's largest zero-subsidy LED lamp distribution scheme.
- It is implemented by Energy Efficiency Services Limited (EESL) under the Ministry of Power.
- Through the UJALA scheme, the government aims to save 85 lakh kWh of electricity and 15,000 tonnes of CO_2 by replacing 77 crore traditional bulbs & CFLs and 3.5 crore street lights with LEDs.

Eligible Households:
- Every domestic household having a metered connection from their respective Electricity Distribution Company is eligible to get the LED bulbs under the UJALA Scheme.
- The consumer can purchase the LED on EMI payment (monthly/bimonthly installments in the electricity bill) or on upfront payment by paying the full amount.
- As part of its inclusive growth strategy to enable growth in lower-income communities, EESL has also enrolled Self-Help Groups (SHGs) for the distribution of LED bulbs under the UJALA programme.
- The annual energy savings from the scheme stand at 47,883 million kWh, with a reduction in peak demand by 9,586 MW and an annual reduction of 3.87 crore tonnes in carbon dioxide emissions.
- These savings were achieved through e-procurement and bulk purchasing, which allowed LED bulbs to be made affordable for millions of households.
- UJALA succeeded in bringing down the retail price of LED bulbs from INR 300-350 per bulb to INR 70-80 per bulb.

Source: The Times of India

EmpowHER Biz Initiative

Why in the news?

The Women Entrepreneurship Platform (WEP) of NITI Aayog, launched EmpowHER Biz – Sapno Ki Udaan in partnership with New Shop, India's convenience retail chain under its Award to Reward (ATR) program.

About EmpowHER Biz Initiative:
- It is a part of Women Entrepreneurship Platform of NITI Aayog, aiming to create a robust retail ecosystem that empowers women entrepreneurs and drives sustainable growth in the sector.
- It will offer mentorship and comprehensive training, covering retail management, digital tools, financial literacy and business development to aspiring women entrepreneurs.
- Under the initiative, 50 participants aged 18–35, will be selected through an online application process based on specific criteria.
- Top 20 of these participants will receive a 100% waiver on New Shop franchise fees, empowering them to own and operate their retail businesses with significantly reduced barriers to entry.
- The program is being launched for women from Delhi NCR, Punjab, Rajasthan, Uttar Pradesh, Haryana, Madhya Pradesh, and Gujarat.

About Women Entrepreneurship Platform:
- It was launched in 2018 by NITI Aayog as an aggregator platform, transitioned into a public-private partnership in 2022.
- It aims at empowering women entrepreneurs by overcoming information asymmetry and providing continuum of support across different pillars- Access to Finance; Market Linkages; Training and Skilling; Mentoring & Networking; Compliance & Legal Assistance and Business Development Services.
- With over 30 public and private sector partners, it fosters collaboration to develop scalable and impactful programs that benefit women entrepreneurs.
- Since 2023, the 'Award to Reward' initiative under WEP offers a plug and play framework for stakeholders to develop impactful programs.

Source: PIB

Project Veer Gatha

Why in the news?

The fourth edition of Project 'Veer Gatha 4.0', as part of Republic Day celebrations has garnered an incredible nationwide response.

About Project Veer Gatha:

- It was launched in 2021 as part of 'Azadi Ka Amrit Mahotsav' to commemorate India's 75th year of Independence.
- The project aims to raise awareness of Gallantry awardees' acts of bravery and the life stories of these heroes.
- The initiative helps instill patriotism and civic values in students.
- The journey of Project Veer Gatha from Edition 1 to Edition 4 has been inspiring, expanding the reach of the competition across the length and breadth of the country.
- It is a joint initiative by the Ministry of Defence and Ministry of Education.

Project Veer Gatha 4.0:

- It presented a variety of thought-provoking topics for essay and paragraph writing.
- Students had the opportunity to write about their chosen role models, particularly focusing on Gallantry Award recipients.
- They were also encouraged to explore the inspiring lives of freedom fighters such as Rani Laxmibai, the 1857 First War of Independence, and the significant role of Tribal Uprisings in India's Freedom Struggle.

Source: PIB

Prime Minister's Wi-Fi Access Network Interface (PM-WANI) Scheme

Why in the news?

The Telecom Regulatory Authority of India (TRAI) has recommended capping Internet tariffs for Wi-Fi service providers under the PM-WANI scheme at twice the rate for retail broadband.

About PM-WANI Scheme:

- It was launched by the Department of Telecommunication in 2020.
- It aims to enhance the proliferation of public WiFi hotspots to create robust digital communications infrastructure in the country, especially in rural areas.
- Through better access to public hotspots, the government aims to increase employment for small and micro-entrepreneurs and provide low-cost internet to the underserved urban poor and rural households.
- The scheme encourages local shops and establishments to provide Wi-Fi for last-mile internet delivery, which does not require a licence or charge a registration fee.

How can one get access to the PM-WANI internet?

- To access public hotspots under the PM-WANI scheme, one needs to download a relevant app which shows the available networks.
- The user can then choose from a list of available connections and make a payment to use the network.
- The user can access the network till his/her balance is exhausted.

PM-WANI Ecosystem Components:

- Public Data Office (PDO): Sets up Wi-Fi hotspots and provides internet access. No license is required from DoT.
- Public Data Office Aggregator (PDOA): Offers authorization, accounting services, and user interfaces for purchasing data plans and monitoring usage.
- App Provider: Develops applications to help users locate and connect to nearby PM-WANI hotspots, facilitating easy internet access.

- Central Registry: Managed by the Centre for Development of Telematics, maintaining records of App Providers, PDOs, and PDOAs.

Source: The Print

Internet Governance Internship and Capacity Building Scheme

Why in the news?

Recently, the National Internet Exchange of India (NIXI) announced the launch of its Internet Governance Internship and Capacity Building Scheme.

About Internet Governance Internship and Capacity Building Scheme:

- This program aims to build awareness and develop expertise in internet governance (IG) among Indian citizens.
- It will equip participants with the knowledge to effectively engage in global internet governance processes with I-Star organisations like Internet Corporation for Assigned Names and Numbers (ICANN), Internet Society or Information Security Operations Center (ISOC), Institute of Electrical and Electronics Engineers (IEEE), Internet Engineering Task Force (IETF)and collaborate closely with leading experts in the field.
- It will nurture a pool of domestic talent who can deeply engage with emerging internet governance issues and contribute to their resolution.
- The internship program offers:
  - a bi-annual internship with two parallel tracks: a six-month program and a three-month program.
  - Each intern will be mentored by subject matter expert from international organizations like ICANN APNIC or APTLD, members from Special Interest Group, high

ranked retired government officials and faculty advisors from recognized institutions/universities.
  - a fixed stipend of 20,000/- per month will be provided to interns along with support to conduct mandatory outreach programs.

Key facts about NIXI:

- It is a not-for- profit company which was set up in 2003 under the aegis of the Ministry of Electronics and Information Technology, Government of India.
- It is tasked with increasing internet penetration and adoption in India by facilitating various infrastructure aspects to enable the internet ecosystem to be managed and used by the masses.
- The four services under NIXI include: Internet Exchange Points (IXPs) for building Internet Exchange Points, .IN Registry for building the .in domain digital identity, IRINN for IPv4 and IPv6 addresses adoption.

Source: PIB

New Sanchar Saathi Mobile App

Why in the news?

Recently, the Union Minister of Communications launched a suite of citizen-focused initiatives namely the Sanchar Saathi Mobile App and the National Broadband Mission (NBM) 2.0.

About New Sanchar Saathi Mobile App:

- It is a user-friendly platform designed to fortify telecom security and empower citizens.
- It provides users with critical tools to secure their telecom resources and combat telecom frauds.

Key features include:

- **Chakshu- Reporting Suspected Fraud Communications (SFC):** Users can report suspected calls and SMS using apps and directly from mobile phone logs.
- **Know Mobile Connections in Your Name**: Citizens can identify and manage all mobile

connections issued in their name, ensuring no unauthorized usage.

- **Blocking Your Lost/ Stolen Mobile Handset:** Lost or stolen mobile devices can be swiftly blocked, traced and recovered.
- **Know Mobile Handset Genuineness**: The app offers an easy way to verify the authenticity of mobile handsets, ensuring users purchase genuine devices.

What is National Broadband Mission (NBM) 2.0?

- It builds on the success of NBM 1.0 which is part of the National Digital Communications Policy, 2018.
- The NBM 2.0 aims to propel India into a new era of digital transformation.
- Following will be the key benefits of NBM 2.0:
- Extending operational optical fiber cable (OFC) connectivity to 2.70 lakh villages by 2030 with 95% uptime from ~50,000 as of now.
- To provide broadband connectivity to 90% of anchor institutions like Schools, PHCs, Anganwadi Centre, and Panchayat offices by 2030.
- To achieve 100% mapping of fiber networks owned by government PSUs by 2026 on PM GatiShakti National Master Plan Platform (PMGS) and use PMGS for planning of Additional Bharatnet project.
- For Ease of Doing Business - reduce the Right of Way application average disposal time from 60 days (now)to 30 days by 2030. In 2019 it was 449 days.
- Work on enhancing the usage of the 'Call Before u Dig' (CBuD) mobile app to protect underground Telecom infrastructure and other utilities.
- Collaborate with all stakeholders viz. Central Ministries and departments, States, UTs and municipalities to ensure the effective implementation of the New RoW Rules 2024, issued under the Telecommunications Act, 2023.

Source: PIB

Diamond Imprest Authorisation (DIA) Scheme

Why in the news?

The Commerce Ministry recently introduced the Diamond Imprest Authorization (DIA) Scheme,

aiming to enhance the global competitiveness of India's diamond industry.

About Diamond Imprest Authorisation (DIA) Scheme:

- It has been introduced by the Department of Commerce, Government of India to allow duty-free import of natural cut and polished diamonds, of less than ¼ Carat (25 Cents), for export purposes.
- The Scheme will be implemented with effect from 01.04.2025.

Key Features of the Scheme:

- This scheme mandates export obligation with value addition of 10%.
- All diamond exporters holding Two Star Export House status and above and having US $15 million exports per year are eligible for availing the benefit under this scheme.
- The scheme has been made in response to the beneficiation policies undertaken in a number of natural diamond mining countries like Botswana, Namibia, Angola, etc, where diamond manufacturers are obliged to open cut and polishing facilities for a minimum percentage of value addition.
- Support for MSME Exporters: Designed to create a level playing field for MSMEs, the scheme enables smaller exporters to compete effectively with larger industry players.
- It is aimed towards retaining India's position as a global leader in the entire value chain of the diamond industry.

Source: The Hindu

Golden Visa Programme

Why in the news?

Recently, Spain's Congress has approved the termination of the controversial Golden Visa programme.

About Golden Visa programme:

- It is a residence by investment plan, which grants temporary residency to foreign nationals in exchange for a significant donation or investment in real estate, business, or other fields is known as a "Golden Visa."
- High-net-worth individuals (HNWIs) often physically relocate to favorable jurisdictions through golden visa schemes, granting them complete legal residency rights, including the facility to live, work, study, and receive healthcare in that nation.

Spain's Golden Visa programme:

- Introduced in 2013, it allowed non-European Union citizens to obtain residency permits by investing a minimum of €500,000 in Spanish real estate.

Reasons for terminating the programme

- It cited the need to address rising property prices and ensure housing availability for local citizens, particularly in major cities.
- The programme was used for money laundering and tax evasion.

Source: Business Standard

Veer Baal Diwas

Why in the news?

Recently, the Prime Minister of India participated in the Veer Baal Diwas event at Bharat Mandapam, New Delhi.

About Veer Baal Diwas:

- It is annually observed on December 26 every year since 2022.
- It is commemorated to honour the martyrdom of Baba Fateh Singh and Zorawar Singh, the sons of 10th Guru Govind Singh Ji.

Background of the Veer Baal Diwas :

- Guru Gobind Singh, along with his family and disciples, were compelled to flee as the Mughal Army encircled the Anandpur fort.
- During the chaos, Guru Gobind Singh's sons, Zorawar Singh and Fateh Singh, were captured by the Mughal forces.
- The two young boys courageously refused to abandon their faith, and consequently, Wazir Khan ordered them to be bricked alive around December 26, 1705.
- Exemplifying bravery and loyalty to their religion, Government of India in 2022 declared to mark December 26 as Veer Bal Diwas annually to honour and remember their sacrifice.

Who was Guru Gobind Singh?

- Guru Gobind Singh was the 10th Sikh Guru, following the demise of his father, Guru Tegh Bahadur, the 9th Guru.
- Contributions to Sikh religion:
- He is renowned for founding the principles of Khalsa or the Five 'K's viz. kesh (uncut hair), kangha (wooden comb), kara (iron or steel bracelet), kirpan (dagger) and kachera (short breeches).
- He fought against the Mughals in the Battle of Muktsar in 1705.
- He declared Guru Granth Sahib as Sikhism's holy scripture in 1708, before his death.

Source: PIB

Bayraktar Akinci

Why in the news?

Turkey has successfully tested the firing of the supersonic missile UAV-122 from the Bayraktar Akinci drone.

About Bayraktar Akinci:

- It is a long-endurance unmanned combat aerial vehicle (UCAV) developed by Turkish drone manufacturer Baykar.
- It has been designed to perform various operations supporting fighter jets. It is capable of performing air-to-ground and air-to-air attack missions.

Features of the Bayraktar Akinci:

- The combat drone has a length of 12.2 m, a height of 4.1 m, and a wingspan of 20 m.
- It stands out for its payload capacity of up to 1,500 kilograms, flight range of 25 hours, and range of 7,500 km.
- It is equipped with dual satellite communication systems, air-to-air radar, electronic support systems, collision avoidance radar, and synthetic aperture radar.
- It is equipped with a triple redundant flight control system.
- The dual artificial intelligence (AI)-powered avionics system integrated into the platform helps in improving signal processing, sensor fusion, and situational awareness in real time.
- The UCAV will be fitted with different weapon payloads such as laser-guided smart munitions, missiles, and long-range stand-off weapons.
- It is also the first drone capable of launching an air-launched cruise missile (ALCM).

Source: India Today

United District Information System for Education (UDISE+) Report 2023-24

Why in the news?

The total enrolment of students has dropped by over a crore in 2023-24 as compared to the previous years,

Unified District Information System for Education Plus (UDISE+) report released by the Ministry of Education (MoE) said recently.

About UDISE+:

- UDISE+ is one of the largest Management Information Systems initiated by the Department of School Education and Literacy (DoSEL), Ministry of Education, Government of India, covering more than 14.72 lakhs of schools, 98.08 lakhs of teachers, and 24.80 crores of children.
- It is an online portal facility created by DoSEL for record of data related to schools, teachers, enrolment, infrastructure, in respect of all recognized schools in the country.
- In UDISE+, school wise data is captured through Data Capture Format (DCF).
- Each school has been provided with a login ID and password for facilitating online data compilation by respective schools.
- The Head Teacher/ Head Master of the school in all the States compiles the data, and it goes through a 3-stage validation/verification process, viz., Block/ Cluster level, District level, and State level.
- This data is finally certified by the State Project Director (SPD) at the State level.
- The data once certified by SPD of the respective State is considered as approved by the State.
- Therefore, data is entered in the UDISE+ portal by the respective State itself.
- UDISE+ data is the only pan-India and most trusted database in school education in the country.

Highlights of UDISE+ Report 2023-24:

- 8 crore students enrolled in 2023-2024, while this figure stood at 25.18 crore in 2022-2023.
- The figures for the previous four years – 26.52 crore (2021-2022), 26.44 crore (2020-2021), 26.45 crore (2019-2020), and 26.03 crore (2018-2019) – show that the average total enrolment stood around 26.36 crore.

- Data shows that when compared from the period between 2018-2019 (reference year for UDISE+ data) and 2021-2022, the decline in enrolment – for the first time since the pandemic – has been over 1 crore between 2022-2023 and 2023-2024.
- Boys account for 51.9% of enrolments and girls 48.1%.
- The representation of minorities in total enrolment stood at around 20 percent.
- Among the minorities, 79.6 percent were Muslims, 10 percent Christians, 6.9 percent Sikhs, 2.2 percent Buddhists, 1.3 percent Jains, and 0.1 percent Parsis.
- In 2023-2024, the total SC students enrolled were 47 crore, while this figure was 4.59 crore in 2022-2023.
- While 2 crore students enrolled in the OBC category in 2023-2024, the same was 11.45 crore in 2022-2023.
- While over 90% of schools have basic amenities like electricity and gender-specific toilets, advanced facilities such as functional desktops, internet access, and ramps with handrails remain limited.
- Only 57.2% of schools have functional computers, 53.9% have internet, and 52.3% are equipped with ramps, underscoring significant gaps in accessibility and tech readiness.

Source: The Hindu

New Type of Visas

Why in the news?

The Ministry of Home Affairs introduced two special category visas namely 'e-student visa' and 'e-student-x' visa for international students intending to pursue higher education in the country.
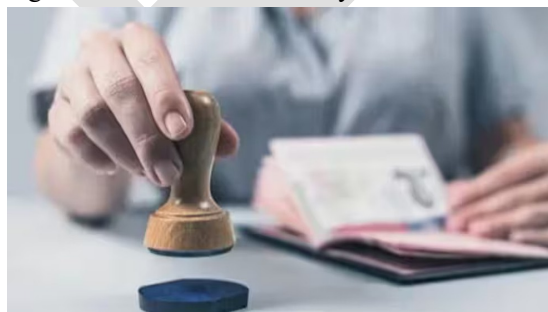
About New Type of Visas:
- The two new visas namely; 'e-student visa' and 'e-student-x' introduced by the Ministry of Home Affairs.

- Eligible international students registered on the Study in India (SII) portal can access the e-student visa facility, while dependents of e-student visa holders are eligible for the e-student-x visa.
- Eligibility: Foreign nationals admitted to full-time undergraduate, postgraduate, PhD, or other formal programs at recognised educational institutions in India are eligible for e-student visas.
- These visas are issued for durations of up to five years, depending on the course length, and can be extended. Holders of valid e-student visas can enter India through any immigration check post.

What is the Study in India (SII) portal?
- It is a flagship initiative by the Ministry of Education, hosting over 600 partner institutions offering more than 8,000 courses across disciplines such as engineering, management, agriculture, sciences, arts, humanities, law, paramedical sciences (including pharmacy and nursing), and specialised fields like Buddhist Studies and Yoga.
- Programmes are available at undergraduate, postgraduate, doctoral, and certification levels, providing flexibility for students to choose courses aligned with their interests at premier Indian institutions.
- The SII portal streamlines the admission process for foreign students seeking to enrol in long-term or short-term courses in the country.

Source: Indian Express

Henley Passport Index 2025

Why in the news?

India's ranking has dropped five places – from 80th to 85th – in the list of the world's most powerful passports, according to the Henley Passport Index 2025.

About Henley Passport Index:
- It is the original, authoritative ranking of all the world's passports according to the number of destinations their holders can access without a prior visa.
- It started in 2006 as the Henley & Partners Visa Restrictions Index (HVRI).
- The index is based on exclusive data from the International Air Transport Association (IATA), the largest, most accurate travel information database. It is enhanced by Henley & Partners' research team.
  ○ Henley & Partners is a London-based advisory firm.
- The index includes 199 different passports and 227 different travel destinations.
- The number of countries that a specific passport can access becomes its visa-free 'score'.

Highlights of Henley Passport Index 2025:
- Singapore has continued to dominate the list of the world's strongest passports, achieving a top rank in 2025 as well. A person with a Singapore passport can travel visa-free to 195 destinations across the world.
- As per its latest standing, an Indian passport holder can travel visa-free to 57 destinations. The country shares its rank with Equatorial Guinea and Niger.
- The EU member states of France, Germany, Italy and Spain all drop two places to share third position. They are joined by Finland and South Korea, with all six passports granting visa-free access in 2025 to 192 destinations.
- Fourth place is equally competitive, with seven EU nations—Austria, Denmark, Ireland, Luxembourg, the Netherlands, Norway, and Sweden—each providing visa-free access to 191 destinations.
- Completing the top five are Belgium, Portugal, Switzerland, the UK, and New Zealand—the only non-European country in this group—all offering visa-free travel to 190 destinations.

Source: Financial Express

Fast Track Immigration – Trusted Traveller Program

Why in the news?

The Union Home Minister inaugurated the 'Fast Track Immigration – Trusted Traveller Program' (FTI- TTP) on 16 January 2025 from Ahmedabad.

About Fast Track Immigration – Trusted Traveller Program:
- It is an initiative to speed up the Immigration clearance process for eligible persons from the following categories: Indian Nationals and Foreign Nationals holding OCI Cards.
- It was first launched at Delhi's IGI Airport in 2024.
- Purpose: It has been introduced with the purpose of facilitating international mobility with faster, smoother and secure immigration clearances.
- To enroll in the scheme, the applicant has to register online on the portal with details and documents.
- One can sign up after successfully authenticating their identity through mobile OTP and email verification. One needs to ensure that the Passport is valid for at least 6 months at the time of applying for FTI-TTP.
- Applicants found eligible, will need to provide Biometrics (fingerprint and face image) in addition to the required information as per the data fields provided in the application form.
- Biometrics of the registered applicants will be captured at the Foreigners Regional Registration Office (FRRO) or at the time of passage through the airport. The registered passenger has to scan the boarding pass issued by the airlines at the e-gates and then scan the passport.
- The FTI registration will be valid for a maximum of five years or until the validity of the passport, whichever comes first.
- It will be implemented at 21 major airports across the country. In the first phase, in addition to Delhi, this facility is being introduced at seven major airports—Mumbai, Chennai, Kolkata, Bengaluru, Hyderabad, Kochi, and Ahmedabad.

- Nodal Agency: The FTI-TTP is implemented through an online portal with the Bureau of Immigration being the nodal agency.
- Significance: Once Indian and foreign citizens with OCI cards enroll and become members of the Fast Track Immigration -Trusted Traveller Programme, their immigration clearance will be faster, easier, and more secure.

Source: PIB

Blood Money

Why in the news?

The death sentence awarded by a Yemen court to a nurse from Kerala, and the subsequent debates and efforts surrounding her acquittal and repatriation, which involves monetary compensation paid to the victim's family, have brought the focus back on 'blood money' and its implications.

About Blood Money:
- Blood money', or 'diya', finds footing in the Islamic Sharia law and is followed in countries that incorporate these laws in their legislation.
- Under the rule of 'diya', a select quantity of a valuable asset, primarily monetary, has to be paid by the perpetrator of the crime to the victim or the victim's family if the latter has died.
- The custom is practised predominantly in cases involving unintentional murder and culpable homicide.
- It is also invoked in murder cases wherein the victim's kin choose not to retaliate through 'qisas' (a way of retribution under the Sharia).
- The end-goal, as the law says, is not to put a price tag on human life but to alleviate the plight and suffering of the affected family and their potential loss of income.
- However, it is to be noted that even if the concerned parties reconcile through 'blood money', the community and the state will retain the right to impose a deterrent punishment, including penalties.
- In its contemporary applications, 'blood money' is upheld in several Islamic countries with factors such as gender, religion, and nationality of the victim coming into play.
- In Saudi Arabia, for instance, the traffic regulations specifically mandate payment of 'blood money' to heirs of the victims who die in road accidents. In addition, the perpetrator shall be liable to a prison term.

What's India's stand on 'diya'?
- Provisions for the grant or receiving of 'blood money' do not find a place in India's formal legal system.
- However, the system does provide a way for the accused to negotiate with the prosecution through 'plea bargaining'.
- Though the concept cannot be directly equated with 'blood money', the scheme lays out a procedure whereby the defendant agrees to plead guilty for a particular offence perpetrated by the accused in return for a concession from the prosecutor.
- Introduced through the Criminal Law (Amendment) Act, 2005, plea bargaining comes with an array of limitations unlike 'blood money', which has a broader purview.
- For instance, plea bargaining can be taken up only for offences that are penalised with imprisonment of less than seven years.
- It cannot be invoked if the accused has been previously convicted for a similar offence.
- Besides, the provision is not available for crimes against women or children aged below 14; heinous crimes such as murder or rape; and offences involving socio-economic conditions, including civil rights.
- Moreover, the accused has to voluntarily come forward to plead guilty, and must not be coerced.
- However, on the lines of 'blood money', plea bargaining may also allow for the victim to receive compensation.

Source: The Hindu

QS World Future Skills Index

Why in the news?

According to the QS World Future Skills Index 2025, India has emerged as the second most prepared job

market globally for future in-demand skills, trailing only the United States.

About QS World Future Skills Index:
- The inaugural Future Skills Index, released by London-based Quacquarelli Symonds (QS), evaluates countries on their readiness to meet evolving job market demands.
- The index assesses four main areas: skills fit, academic readiness, future of work, economic transformation

Highlights of the Report:
- The index highlights India's strong potential in critical sectors such as Artificial Intelligence (AI), digital, and green industries.
- India ranks 25th overall across all indicators, earning recognition as a "future skills contender." Notably, the country excels in the "Future of Work" category, securing the second-highest global score (99.1), just behind the United States.
- India's performance in the Future of Work indicator underscores its readiness to meet emerging job market demands. Alongside Mexico, India is identified as the most prepared nation to recruit for digital roles.
- "India's outstanding GDP growth, youthful population, and burgeoning start-up culture position the country as a global leader in future-ready skills.
- While India shines in certain areas, the report highlights opportunities for improvement. These include:
- Enhancing Industry Collaboration: Bridging the gap between higher education institutions and industry needs to be done.
- Equipping Graduates with In-Demand Skills: Expanding focus on digital, AI, and green sectors needs to be aligned with employers'
- Future-Oriented Innovation and Sustainability: India scores low on this metric, indicating a need to prioritize sustainable practices and forward-looking solutions.

Source: Financial Express

Global Risk Report

Recently, the World Economic Forum published a Global Risk Report.

About Global Risk Report:
- The first edition of the report was published in 2006 in which extreme weather events have been categorised under "environmental risks."
- This year's report presents the findings of the Global Risks Perception Survey 2024 - 2025 (GRPS).

Key points of the Report:
- These risks are assessed over both short-term (1-2 years) and long-term (10 years) horizons to guide policymakers in balancing immediate concerns with future challenges.
- It classified global risks across economic, environmental, geopolitical, societal and technological domains.
- **Top 3 short-term risks:** It includes misinformation and disinformation, extreme weather events and state based armed conflict.
- **Top 3 Long term risks:** It includes extreme weather events, biodiversity loss & ecosystem collapse and critical change to earth systems.
- The evolving global risk landscape is shaped by the interaction of four critical spheres: technological, geostrategic, climatic and demographic.
- These forces are expected to intensify over the next decade and beyond, resulting in a complex and interconnected web of challenges.

- The report further stresses the importance of addressing short-lived climate pollutants, such as black carbon, methane and hydrofluorocarbons, which have significant environmental and health impacts.

Source: Down to the earth

World Employment and Social Outlook Report

Why in the news?

Recently, the International Labour Organization's (ILO) published the World Employment and Social Outlook:Trends 2025 in Geneva.
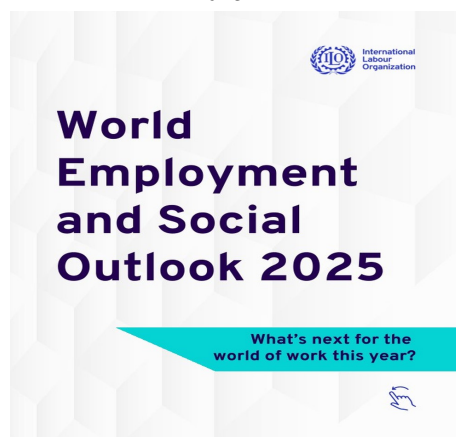
About World Employment and Social Outlook Report:

- It provides a detailed analysis of the state of global labour markets, highlighting key trends and challenges.
- It explores issues such as the slowdown in labour market recovery, the persistence of youth unemployment, and the widening global jobs gap.

Key highlights of the Report:

- In 2024, global employment grew in line with the labour force, keeping the unemployment rate steady at 5%.
- Geopolitical tensions, the rising costs of climate change and unresolved debt issues are the challenges before the recovery and the reasons for putting labour markets under pressure.
- The labour force participation rates have dropped in low-income countries while increasing in high-income nations, mainly among older workers and women, the report pointed out.
- The report urged member countries:
  - To boost productivity, invest in skills training, education and infrastructure to support economic growth and job creation.
  - Expand social protection: provide better access to social security and safe working conditions to reduce inequality.
  - Use private funds effectively: low-income countries can harness remittances and diaspora funds to support local development

Source: The Hindu

PRACTICE QUESTIONS FOR MAINS EXAM

1. Define left-wing extremism. How can technology be effectively utilized to address the challenges posed by left-wing extremism in India? (8 Marks, 125 Words)
2. What is blockchain technology? Explain how blockchain can enhance transparency and efficiency in government schemes. (8 Marks, 125 Words)
3. Discuss the significance of the Blue Economy in India's economic growth and sustainability. (8 Marks, 125 Words)
4. How do microfinance institutions contribute to financial inclusion and rural entrepreneurship in India? (8 Marks, 125 Words)
5. Why is self-reliance in semiconductor manufacturing crucial for India's technological and economic security? (8 Marks, 125 Words)

6. Examine the key drivers of Uttar Pradesh's economic growth and analyze the role of infrastructure and industrial development in shaping its economy. (8 Marks, 125 Words)

7. Define coastal security. Analyze the measures taken to strengthen coastal security post-26/11 Mumbai attacks. (8 Marks, 125 Words)

8. Critically analyze the impact of quantum computing on cyber security and encryption systems. (8 Marks, 125 Words)

9. Discuss the economic and environmental implications of India's transition to a green hydrogen economy. (8 Marks, 125 Words)

10. Compare and contrast the economic implications of decentralized cryptocurrencies and the RBI's Central Bank Digital Currency (CBDC). (8 Marks, 125 Words)

खण्ड — ब/Section - B

11. Discuss the challenges of cyber threats to India's internal security. Evaluate the role of public-private partnerships and international cooperation in strengthening India's cybersecurity framework. (12 Marks, 200 Words)

12. Critically analyze the role of India's Semiconductor Mission in reducing dependence on foreign technology. (12 Marks, 200 Words)

13. What impact will the adoption of 5G have on India's digital economy and industrial growth? Discuss with examples. (12 Marks, 200 Words)

14. How will AI-driven automation reshape employment and economic productivity in India? Examine the key challenges and opportunities. (12 Marks, 200 Words)

15. Explain the concept of hybrid warfare. Assess how hybrid threats are reshaping India's internal security strategies and the steps needed to address these evolving challenges. (12 Marks, 200 Words)

16. Discuss how India can balance economic growth with its transition towards renewable energy sources for energy security. (12 Marks, 200 Words)

17. Explain the role of biotechnology in enhancing food security and ensuring sustainable agriculture in India. (12 Marks, 200 Words)

18. Examine the role of localized militia and village defense committees in ensuring internal security in conflict-prone regions. Evaluate their effectiveness and the potential risks they pose to governance and human rights. (12 Marks, 200 Words)

19. Analyze the financial implications of India's National Hydrogen Policy. How can government funding, private sector investment, and international collaboration contribute to scaling up hydrogen production and infrastructure in India. (12 Marks, 200 Words)

20. How can the development of indigenous technologies in critical sectors like semiconductors, artificial intelligence, and renewable energy strengthen India's economic growth while addressing internal security challenges such as cyber threats, energy dependency, and strategic vulnerabilities? Critically analyze. (12 Marks, 200 Words)