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Gist of

20 PRACTICE QUESTIONS
FOR MAINS EXAM



Raghav Publication House

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CURRENT AFFAIRS

ENVIRONMENT & ECOLOGY

Corpse Flower

Why in the news?

Recently, a “corpse flower” at the Royal Botanic Gardens of Sydney has drawn more than 20,000 curious viewers to a special display for its much-anticipated opening.



About Corpse Flower:

- It is the common name of Titan arum
- Scientific name: *Amorphophallus titanum*
- It is native to the Sumatra Island, Indonesia and gets its name from the literal translation of the Indonesian phrase Bunga bangkai.
- Chemicals emitted during female flowering are: Dimethyl disulfide, Dimethyl trisulfide, 3-Methylbutanal, Methanethiol, Methyl thioacetate and Isovaleric acid.
- It is categorized as Endangered by the IUCN.

Features:

- Some corpse flowers have been known to grow 3 meters tall before revealing a phallic spadix (or spike).
- The spadix of the flower emits a foul odor that smells like rotting meat to attract pollinators. Its blooms are often inconsistent.
- Many flowers bloom once a decade, though sometimes more frequently.

Life Cycle:

- The life cycle depends on the time it takes for the “corm” of the flower to gather enough energy to bloom.
- When enough energy has been stored through leaf cycles, the flowering stage begins.
- The bloom lasts for a day, with the spathe (the purple, petal-like structure surrounding the spadix) taking hours to fully unfurl.
- These flowers have both male and female flowers. Female flowers open first to prevent a plant from pollinating itself. Nearby flowers are required to bloom at similar times in order for cross-pollination to be possible.
- Insects attracted to the odor are ones that lay their eggs in decaying meat, but they have the benefit of moving pollen between male and female flowers to trigger the flower’s reproductive cycle.

Source: Indian Express

New Ramsar Sites

Why in the news?

Recently, four more wetlands from India have got an international tag of Ramsar Convention sites.



About New Ramsar Sites Added:

Sakkarakottai Bird Sanctuary:

- Location: Tamil Nadu
- It is a unique mosaic wetland ecosystem located close to the Gulf of Mannar on the Central Asian flyway, a regular route for the migratory birds that comes from Iran, Afghanistan and Pakistan.

- This wetland acts as a breeding ground for several Resident/Resident-Migrant species of waterfowls.

Therthangal Bird Sanctuary:

- Location: Tamil Nadu
- It lies along the Central Asian Flyway and are critical breeding and foraging grounds for waterbirds.
- It plays a crucial role in climate regulation, recharging of groundwater, and irrigation.
- The sanctuary is home for many important endemic and near threatened species including the Painted stork, Black-headed ibis, Spot-billed pelican, Oriental darter and Pallied harrier among others

Udhwa Lake:

- Location: Jharkhand
- It is named after saint Uddhava of Mahabharat times, a friend of Lord Krishna.
- It falls within the Gangetic Plains biogeographic zone.
- The Sanctuary has two water bodies i.e. Patauran (155 ha) and Berhale (410 ha), interconnected by a water channel. Patauran is a comparatively clean water body.
- It is the first Ramsar designated wetland from Jharkhand.

Khecheopalri Lake:

- Location: Sikkim
- It is a sacred gem revered by both Buddhists and Hindus.
- It is known as a wish-fulfilling lake, its tranquil waters are believed to be blessed by Guru Padmasambhava and the Goddess Tara.
- It is surrounded by lush forests and the mystical aura of ancient legends, this enchanting lake, part of the revered Demazong valley.

Source: The Times of India

Ambergris

Why in the news?

Ambergris is one of nature's most bizarre occurrences which originates from sperm whales, indirectly promoting the exploitation of these marine mammals.



About Ambergris:

- It is a waxy substance often called whale vomit which is produced by sperm whales.
- Its rarity and desirability make ambergris one of the most expensive substances in the world.
- It is highly sought after in the perfume industry, as it helps make fragrances last longer.
- There is a ban on the possession and trade of ambergris in countries like the USA, Australia and India.
- In India, the sale and trade of ambergris are strictly prohibited under the Wildlife Protection Act, 1972.

How is it formed?

- Scientists believe that ambergris is formed in the intestines of sperm whales.
- The substance is created when the whale consumes indigestible materials, such as squid beaks, and forms ambergris to help expel these foreign objects.
- Once expelled, the ambergris floats in the ocean.

Appearance:

- It is soft and has a waxy, greasy appearance. Over time, as it floats in the ocean and is exposed to sunlight, saltwater, and air, it hardens and develops a rock-like appearance.
- The outer layers become crusty and rough, resembling a stone, while the inside may retain a softer, waxier texture.

Source: The Hindu

International Big Cat Alliance

Why in the news?

Recently, in a major development, the Framework Agreement on establishment of the International Big Cat Alliance (IBCA) has officially come into force.



About International Big Cat Alliance:

- It was established by the Government of India, through the nodal organisation viz., National Tiger Conservation Authority (NTCA), Ministry of Environment, Forest & Climate Change (MoEFCC).

- It was launched on 9th April 2023, during the event 'Commemorating 50 years of Project Tiger'.
- It aims to conserve the seven big cats - Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar and Puma.
- Membership: It is open to 97 'range' countries, which contain the natural habitat of these big cats, as well as other interested nations, international organizations, etc.
- Present Member countries: Nicaragua, Eswatini, India, Somalia and Liberia - have deposited the instruments of ratification under the Article VIII (1) of the Framework Agreement.

Objective:

- To facilitate collaboration and synergy among stakeholders, consolidating successful conservation practices and expertise to achieve a common goal of conservation of big cats at global level.
- This unified approach, bolstered by financial support, aims to bolster the conservation agenda, halt the decline in big cat populations, and reverse current trends.

Governance Structure:

- A General Assembly consisting of all member countries.
- A Council of at least seven but not more than 15 member countries elected by the General Assembly for a term of 5 years, and a Secretariat.
- Upon the recommendation of the Council, the General Assembly will appoint the IBCA Secretary General for a specific term.
- Funding: It has secured Government of India's initial support of Rs. 150 crore for five years (2023-24 to 2027-28).

Source: PIB

Bryospilus bharaticus

Why in the news?

Recently, a new species of water flea was discovered from moss growth found on walls of Korigad Fort near Pune and named it as Bryospilus (Indobryospilus) bharaticus n. sp.



About Bryospilus bharaticus:

- It is a species of water flea belonging to the Bryospilus genus.
- This recent discovery from western India is the first for the whole of Tropical Asia.

Features:

- It uses antennae as 'supports' to crawl through thick, debris-filled water films on moss.
- The antennae have big spines that assist sideways and forward movement.
- The fleas' main eye is absent because it lives in reduced light and does not require colour distinction for foraging.
- Distribution: It has been found in semi-terrestrial habitats in rainforests of West Africa, South and Central America, and New Zealand.
- Habitat: The distant relatives of this species are found in open waters, while many are found in littoral (vegetated) regions of different water bodies.
- The genus Bryospilus is a unique animal with characteristic adaptations suited for living in "semi-terrestrial" environments, such as water film found on mosses.
- Ancestors of this species were potentially present on the Indian subcontinent before the breakup of Gondwanaland started approximately 200 million years ago.

What are water fleas?

- These are small aquatic animals belonging to crustacea groups that feed on small algae by filtering them from water.
- Most water fleas are found in freshwater habitats, but a few occur in marine environments.

Source: The Hindu

Rhododendron wattii Tree

Why in the news?

Recently, a study highlighted the endangered Rhododendron wattii in Nagaland.



About Rhododendron wattii:

- It is a small tree attaining a maximum height of 25 feet.
- It is endemic to India and is found in Manipur and Nagaland, in its natural habitat at Dzukou Valley (Nagaland).

- It was first collected by Sir George Watt from Nagaland's Japfu Hill range during his 1882-85 survey.

Characteristics of the tree:

- It is an evergreen plant, and leaf renewal occurs throughout the year.
- Its flowering occurs from the end of February to April, and fruiting is observed from April to December.
- The flowers present in trusses of 18-25 flowers are pink with darker flecks and purplish basal blotches.
- It is foraged and pollinated by the fire-tailed sunbird (*Aethopyga ignicauda*) and bumble bees.

Issues with *Rhododendron wattii*:

- A recent study has found that the natural regeneration of the plant species to be very low although it produces numerous seeds.
- Poor seedling survivability, anthropogenic activities and wildfires were among the factors responsible for the disappearance of this species.

Source: The Hindu

Shatavari Plant

Why in the news?

In a bid to raise awareness about the health benefits of medicinal plants, a species-specific campaign titled "Shatavari –For Better Health" was launched by the Minister of State (Independent Charge), Ministry of Ayush.



About Shatavari Plant:

- *Asparagus racemosus* (family Asparagaceae), also known by the name Shatavari, is one of the well-known drugs in Ayurveda. Shatavari means "acceptable to many".
- It belongs to the family Liliaceae and is commonly known as Satawar or Satamuli.
- Appearance: It is a woody climber growing to 1-2 m in height. The leaves are like pine needles, small and uniform and the flowers are white and have small spikes.
- Habitat and Distribution: Its habitat is common at low altitudes in shade and in

tropical climates throughout Asia, Australia and Africa.

- In Ayurveda, this amazing herb is known as the "Queen of herbs", because it promotes love and devotion.
- Charak Samhita, written by Charak, and Ashtang Hridayam, written by Vagbhata, list racemosus as part of the formulas to treat women's health disorder.

Uses of Shatavari Plant:

- The dried roots of the plant are used as a drug. The roots are said to be tonic and diuretic and galactagogue, the drug has ulcer healing effect probably via strengthening the mucosal resistance or cytoprotection.
- This herb is highly effective in problems related to the female reproductive system.

Source: PIB

Salamander

Why in the news?

Researchers discovered that wandering salamanders can rapidly fill, trap, and drain the blood in their toe tips to optimize attachment, detachment and general locomotion through their arboreal environment.



About Salamander:

- It is an amphibian with a slender body and a long tail.

Features of the Salamander:

- Their size varies with different species, ranging from 2.5 cm to 20 cm. The largest salamander in the world is the Chinese Giant Salamander, which can grow up to a length of 5 feet.
- Most salamanders look like a cross between a lizard and a frog. They have moist, smooth skin, like frogs, and long tails, like lizards.
- They are nocturnal and cold-blooded species and their temperature changes with their habitat.
- Some salamander species can be poisonous, and some even have teeth.
- They are capable of regenerating lost limbs within a few weeks, including tails and toes, allowing them to survive attacks from predators.

- **Habitat:** They live in or near water or find shelter on moist ground and are typically found in brooks, creeks, ponds, and other moist locations, such as under rocks.
- **Distribution:** They are mainly found in North America, Europe, Asia, the northern parts of South America and North Africa.

Highlights of the research:

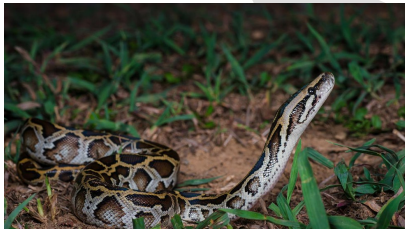
- The researchers have uncovered that the wandering salamanders can finely control and regulate blood flow to each side of their toe tips.
- This allows them to adjust pressure asymmetrically, improving grip on irregular surfaces like tree bark.
- The blood rushing in before “toe off” appears to help salamanders detach rather than attach. By slightly inflating the toe tip, the salamanders reduce the surface area in contact with the surface they are on, minimising the energy required to let go.
- **Significance:** Insights into salamander toe mechanics could ultimately inform the development of adhesives, prosthetics, and even robotic appendages.

Source: The Hindu

Burmese Pythons

Why in the news?

University of Florida scientists have statistically analyzed large amounts of data collected by Burmese python contractors, revealing critical insights about how to most efficiently remove the reptiles.



About Burmese Pythons:

- It is one of the largest snake species in the world. It can grow up to 20 feet and weigh more than 250 pounds, with females being larger than males.
- It is a non-venomous, solitary and mainly nocturnal forest dweller snake.
- It is also an excellent swimmer and is able to stay submerged for up to half an hour.
- Burmese pythons spend the majority of their time hidden in the underbrush and will usually move only when hunting or when threatened.

- Until 2009, it was considered a subspecies of *Python molurus*, but is now recognized as a distinct species.
- **Habitat:** grasslands, marshes, swamps, wet rocky areas, caves, woodlands, rainforests, mangrove forests, river valleys and forests with open clearings

Distribution:

- It is native to the tropical rainforests and subtropical forests of eastern and northeastern India, Myanmar, southern China, Southeast Asia, and to some extent of the Indonesian archipelago. Its distribution also encompasses eastern Nepal, Bhutan and Bangladesh.
- It is an invasive species in Florida, as a result of the pet trade.

Conservation Status:

- IUCN: Vulnerable

Source: Down to earth

Black Seadevil Fish

Why in the news?

Researchers recently recorded the first-ever sighting of an adult abyssal anglerfish, also known as ‘black demon fish’ or ‘black seadevil fish’ in broad daylight.



About Black Seadevil Fish:

- The Black Seadevil Fish, also known as abyssal or humpback anglerfish, is a deep-sea fish known for its terrifying appearance and unique hunting adaptations.
- **Scientific Name:** *Melanocetus johnsonii*
- It is referred to as the black devil due to its dark colours, sinister-looking sharp teeth, and monstrous shape.
- **Habitat:** It is found in the deep ocean, often at depths exceeding 2,000 meters (6,600 feet). It prefers total darkness and high-pressure environments.

Features of the Fish:

- It has a huge head, glassy fangs, and a body that can stretch to contain prey larger than the fish
- It lures other fish towards it with a “fishing rod” with a luminous lure on its nose.
- It has a gelatinous body, which helps it survive under extreme pressure.

Conservation Status:

- IUCN Red List: Least Concern

Source: The Economic Times

White-Winged Duck**Why in the news?**

A pair of rare endangered white-winged ducks (Deo Hanh), which is the state bird of Assam, was spotted in Dihing Patkai National Park by conservationists and forest officials recently.

**About White-Winged Duck:**

- The White-Winged Duck, also known as the White-Winged Wood Duck, is a large, rare, and endangered species of duck found in freshwater wetlands and dense tropical forests of South and Southeast Asia.
- Scientific Name: *Asarcornis scutulata*
- In Assamese, it is known as 'Deo Hans' or spirit duck because of its ghostly call.
- It is considered one of the most threatened waterfowl species in the world.

Distribution of the White-Winged Duck :

- Prefers dense tropical and subtropical forests with slow-moving rivers, swamps and wetlands.
- Found in India, Bangladesh, Myanmar, Thailand, Laos, Cambodia, Vietnam, Indonesia (Sumatra), and Malaysia.
- In India, it is mostly found in the Dibru-Saikhwa National Park, Kaziranga National Park, and the wetlands of Arunachal Pradesh and Assam.

Features of the duck:

- It has a black body, a white head that is thickly spotted with black, conspicuous white patches on the wings, and red or orange eyes.
- Its average length is about 81 cm.
- The sexes are more or less alike, the male having more gloss on the plumage, and being much larger and heavier.
- It is a crepuscular bird, as it is most active at dusk and dawn. The adults are largely omnivorous.

Conservation Status:

- IUCN Red List: Critically Endangered

Source: The Times of India

Loggerhead Turtle**Why in the news?**

A recent study revealed that the loggerhead turtle can learn and remember the magnetic signature of an area and does a 'turtle dance' when in a location that they associate with food.

About Loggerhead Turtle:

- It is a species of oceanic turtle belonging to the family Cheloniidae.
- It is named Loggerhead for their large heads that support powerful jaw muscles.
- It is the world's largest hard-shelled turtle, slightly larger at average and maximum mature weights than the Green sea turtle and the Galapagos tortoise.
- It is also the world's second largest extant turtle after the leatherback sea turtle.
- It uses the geomagnetic field as a map when navigating large distances.
- Distribution: It has a cosmopolitan distribution, nesting over the broadest geographical range of any sea turtle. It inhabits the



Atlantic, Indian and Pacific Oceans, and the Mediterranean Sea.

- Diet: It is omnivorous, feeding mainly on bottom-dwelling invertebrates, such as gastropods, bivalves, and decapods. It has a greater list of known prey than any other sea turtle.
- Conservation status:
 - IUCN: Vulnerable
- Threats: Bycatch in fishing gear, Climate change, Direct harvest of turtles and eggs, Loss and degradation of nesting habitat, Ocean pollution/marine debris.

Source: The Hindu

Blue-cheeked Bee-eater**Why in the news?**

Recently, the first breeding site of the Blue-Cheeked Bee-eater (*Merops persicus*) in peninsular India has been discovered in the salt pans of Aandivilai near the Manakudy Mangroves in Kanniyakumari district.



About Blue-cheeked Bee-eater:

- It is a near passerine bird in the bee-eater family, Meropidae.
- It was historically known as passage migrant and winter visitor in India.
- Behaviour: It may choose to nest solitarily or in small, loose colonies of up to ten individuals. It is also known to share colonies with European bee-eaters.
- Breeding Range: Its breeding was primarily recorded in regions such as Nile Delta, Pakistan and Iran while its wintering grounds include parts of Africa.
- Habitat: This bird favors sub-tropical semi-desert regions dotted with sparse trees, such as acacias, for breeding.
 - In its breeding grounds, this species occupies semi-desert, steppe, dunes, saline pans, cultivation, thorn woodland and sandy slopes with small gulleys, ravines, quarries, pits and embankments.
 - It breeds mainly in sand deserts near bodies of water fringed with reeds and tamarisks.
 - During the non-breeding season, it inhabits a wide variety of greener habitats including savanna, broad river valleys, woods, lakeshores, swamps, ponds, dams, waterworks and cultivation.
- Conservation status:
 - IUCN: Least Concern

Source: The Hindu

Bathousim

Why in the news?

Recently, the Bodoland Territorial Council (BTC) in Assam has included 'Bathouism' as an official option in the religion column of various application forms.



About Bathousim:

- It is the traditional faith of the Bodos, the largest plains tribe of Assam.
- The word 'Bathou' is derived from the Bodo language, where 'Ba' means 'five' and 'thou' means 'deep philosophical thought'.
- The faith system is based on five elements: Bar (Air), San (Sun), Ha (Earth), Or (Fire), and Okhrang (Sky).
- Beliefs of Bathousim:
- The community worships Bwrai Bathou as the supreme god. In the Bodo language, the word 'Bwrai' refers to the 'eldest' man concerning power or knowledge.
- The Bathou faith is centred on the Sijou plant (Euphorbia splendens).
- In Bathou religion, the Sijou plant has an important place and has been widely accepted as the symbol of life or soul by the Bodo people since time immemorial.
- This plant is the living symbol of Bathoubwrai, the supreme God of the Bodos.
 - Bodos plant the sijou tree on an elevated altar encircled with a bamboo fencing of eighteen pairs of posts weaved with five pieces of bamboo split.
 - The five bamboo strips signify the five bindings of Bathou, viz. (i) birth, (ii) marriage or procreation, (iii) sorrow, (iv) happiness and (v) death.

Source: Down to earth

Strobilanthes gigantha

Why in the news?

A new species, *Strobilanthes gigantha*, has been discovered in Arunachal Pradesh, within the Indian Himalayan Region (IHR).

About *S. gigantha*:

- It is a new species of flowering plant discovered in Arunachal Pradesh, within the Indian Himalayan Region (IHR).
- This species stands out due to its exceptionally large size—sometimes growing into a tree—along with unique floral characteristics such as densely imbricate bracts, uninterrupted inflorescence, a slightly curved corolla tube, and wings on the staminal curtain.



- The genus *Strobilanthes* is the second largest within the *Acanthaceae* family (a family of dicotyledonous flowering plants), comprising around 450 species globally, with 167 species found in India, primarily in the Himalayas and Western Ghats.

- The Eastern Himalayas, particularly Arunachal Pradesh, serve as a biodiversity hotspot for this genus, housing 41 known species.

Source: India Today

GEOGRAPHY & DISASTER

Deep Ocean Mission



Why in the news?

The Ministry of Earth Sciences recently announced that the country is set to launch its first human underwater submersible (Deep-Sea Manned Vehicle) as part of the Deep Ocean Mission.

About Deep Ocean Mission:

- It is a mission-mode project to support the Blue Economy Initiatives of the Government of India.
- It is a high-level multi-ministerial, multidisciplinary programme for a better understanding of the deep sea living and non-living resources of the Indian Ocean.
- It was launched as a Central Sector Scheme with the overall estimated cost of Rs 4,077 crores for two phases of the Mission period during 2021-2026.
- The Ministry of Earth Sciences (MoES) is the nodal Ministry implementing this multi-institutional mission.
- The mission consists of 6 major components:
 - Development of Technologies for Deep Sea Mining and Manned Submersible and Underwater Robotics;
 - Development of Ocean Climate Change Advisory Services;
 - Technological innovations for exploration and conservation of deep-sea biodiversity;
 - Deep Ocean Survey and Exploration;
 - Energy and freshwater from the Ocean; and

- Advanced Marine Station for Ocean Biology

- The Samudrayaan project under the Deep Ocean Mission is for the development of a manned submersible to carry three people to a depth of 6000 meters in the ocean with a suite of scientific sensors for ocean exploration and observation. The vehicle is called Matsya 6000.

Source: Business Standard

Green Cardamom

Why in the news?

An international team of researchers have identified six species that are close cousins to *Elettaria cardamomum*, better known as green cardamom.

About Green Cardamom:

- It belongs to the *Zingiberaceae* family and is popularly known as Queen of Spices.
- It is native to the evergreen rain forests of Western Ghats.
- It is cultivated mainly in the Southern States viz; Kerala, Karnataka and Tamil Nadu.
- Growth of cardamom is enhanced when planted in humus rich soils with low to medium phosphorus and medium to high potassium.
- It is used as a flavoring agent and drug in traditional medicine.

Required climatic conditions:

- **Soil:** It is grown in forest loamy soils which are usually acidic in nature with a pH range of 5.0 – 6.5
- **Altitude:** This crop can be grown at an



elevation from 600 to 1500 m.

- Temperature: 10 to 35 degree C
- Rainfall: 1500 to 4000 mm

Newly Identified Cardamom species:

- The genus *Elettaria* now has seven species, including cardamomum, *E. ensal*, *E. floribunda*, *E. involucrata* and *E. rufescens*, which were earlier placed in a separate genus *Alpinia*.
- The remaining two are new species, *facifera* and *E. tulipifera*, the former described from Kerala's Periyar Tiger Reserve in Idukki district and the latter from the Agasthyamalai hills in Thiruvananthapuram district and Munnar
- Seed capsules of the cardamomum provide the commercial green cardamom.

Source: The Hindu

Extra Long Staple Cotton

Why in the news?

Recently, the union finance minister announced a five-year mission to "facilitate significant improvements in productivity and sustainability of cotton farming, and promote extra-long staple (ELS) cotton varieties".

About Extra Long Staple Cotton:

- It is commonly hailed as the gold standard in textile manufacturing, and holds a coveted position in the world of high-quality fabrics.
- Most ELS cotton comes from the species *Gossypium barbadense*, commonly known as Egyptian or Pima cotton.
- ELS varieties boast fibre lengths of 30 mm and above.
- The warm temperatures and rich soil contribute to the growth of cotton fibres that are not only long but also uniform, resulting in stronger and finer yarns.
- It does not require intense finishing processes, which helps preserve these innate qualities.

Origin and distribution:

- It originated in South America and today it is mainly grown in China, Egypt, Australia and Peru.
- In India, some ELS cotton is grown along rainfed parts of Atpadi taluka in Maharashtra's Sangli district, and around Coimbatore in Tamil Nadu.



Issues of Extra Long Staple Cotton in India:

- Yield: It gives lower than average per acre yields, experts say. While the medium staple variety yields between 10 and 12 quintals per acre, ELS cotton has a yield of only 7-8 quintals.
- Marketing issue: Farmers growing ELS cotton are often unable to market their produce at premium prices.

Source: The Times of India

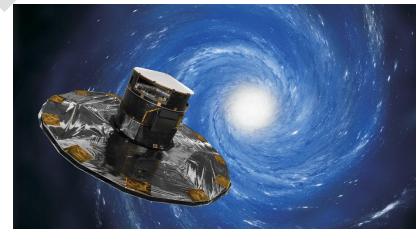
Gaia Mission

Why in the news?

Astronomers have recently discovered a gigantic black hole named Gaia BH3 hiding close to the earth, the third of its kind using the European Space Agency's Gaia telescope.

About Gaia Mission:

- Gaia, the Global Astrometric Interferometer for Astrophysics, is a European Space Agency (ESA)'s astronomical observatory mission.
- Its goal is to create the largest, most precise three-dimensional map of the Milky Way by surveying about 1% of the galaxy's 100 billion stars.
- It was launched in 2013.
- Nestled at the Lagrange Point 2, some 1.5 million kilometers away from Earth, Gaia orbits the sun in sync with our planet.
- It is shielded by Earth from the sun's glare and free from the distorting effects of Earth's atmosphere, which plague ground-based telescopes' observations.
- It scans the whole sky every two months.
- The 2.3 meters Gaia satellite is attached to a 10 meters circular sunshield and is fitted with two telescopes that sit 106 degrees apart.
- Gaia provides unprecedented positional and radial velocity measurements with the accuracies needed to produce a stereoscopic and kinematic census of about one billion stars in our Galaxy.
- Gaia also maps Solar System objects, primarily main belt asteroids circling the Sun between the orbits of Mars and Jupiter.
- With its ability to detect faint and fast-moving objects, it is expected that Gaia will also detect several thousand Near-Earth Objects (NEOs).



Einstein Ring

Why in the news?

Recently, the European Space Agency's Euclid space telescope has discovered a rare ring of light, known as an Einstein ring, around a galaxy nearly 590 million light-years away from Earth.



About Einstein Ring:

- It is a rare ring of light around a form of dark matter, galaxy or cluster of galaxies.
- It is essentially an example of gravitational lensing.
- Einstein rings are not visible to the naked eye, and can be observed only through space telescopes such as Euclid.
- In the case of the recently discovered Einstein ring, NGC 6505 was the gravitational lens.
- The nearer galaxy distorted and amplified the light coming from a distant unnamed galaxy, located 4.42 billion light-years away.
- The first Einstein ring was discovered in 1987, and since then, several more have been discovered.

Significance of Einstein ring:

- These rings help scientists investigate dark matter, which has never been detected but is believed to make up 85% of the total matter in the universe.
- They enable scientists to learn about distant galaxies, which otherwise might not be visible.
- They can also provide information about the expansion of the universe as the space between the Earth and other galaxies — both in the foreground and the background

What is Gravitational lensing?

- It is a phenomenon which occurs when a massive celestial body — such as a galaxy or cluster of galaxies — creates a gravitational field which distorts and amplifies the light from distant galaxies that are behind it but in the same line of sight.
- The body causing the light to curve is called a gravitational lens.

Source: Indian Express

Fulani Community

Why in the news?

A new study has found that the Fulani, one of Africa's largest pastoral populations, have a history going back to the 'Green Sahara' period (12,000–5,000 years before the present).

About Fulani Community:

- The Fulani are a large and widely dispersed group of both nomadic herders and sedentary farmers living in the African Sahel/Savannah belt.
- They are concentrated principally in Nigeria, Mali, Guinea, Senegal, and Niger But can also be found in several other countries.
- Language: The Fulani language, known as Fula, is classified within the Atlantic branch of the Niger-Congo language family.
- Fulani are divided into three groups: Makiyaya (herders), Fulanin Soro (those living in towns) and Bararo, which refer to Fulani living in forests. Bararo retain a close cultural connection to ancestral nature, belief systems and rituals.

Social structure of Fulani Community:

- The social structure of the pastoral Fulani is egalitarian, in marked contrast to that of other Muslim groups, such as the Hausa.
- They value family and community, with strong kinship ties and clear gender roles.
- Polygamy is practiced, and marriage is an important cultural milestone, often accompanied by elaborate rituals and festivals.
- Their traditions are deeply intertwined with their spirituality, which is influenced by Islam, as well as their connection to the land and nature.
- Fulani women are also known for their skill in weaving and craftsmanship.
- Fulani women are famous for their intricate hairstyles, which are often adorned with beads, cowrie shells, and other decorative elements.



Source: Down to earth

Earthquake Swarm

Why in the news?

A state of emergency has been declared on Greece's Santorini and the nearby islands of Ios, Amorgos, and

Anafi after a swarm of undersea earthquakes this month.



About Earthquake Swarm:

- It occurs when multiple seismic events of comparable intensity strike a small area in relatively quick succession.
- It involves a series of many (sometimes thousands) low-intensity earthquakes without a discernible main shock that can occur over weeks in active geothermal areas.
- When seismic energy piles up inside the Earth and is released in small amounts from certain points, such a series of earthquakes can occur.

What causes swarm sequences?

Fluid movement:

- In volcanic environments, this can be fluid released from deeper magma or circulating within active geothermal areas (in volcanic areas such as the Taupō Volcanic Zone).
- The earthquakes triggered by fluids occur as faults slip on the cracks and faults through which the water is moving.

Active volcanism:

- Magma movement can also act as the 'driving mechanism' for swarms, creating the earthquakes as magma-filled cracks push their way through the Earth's crust.
- In such a case the earthquakes commonly occur near the crack tip (ahead of the magma where the crack is starting to open), or off to the side of the crack.

Slow-slip events

- A slow-slip event is essentially an earthquake in slow-motion, and typically involves centimetres to tens of centimetres of movement along a fault, over weeks to years.
- We commonly see slow slip events at the Hikurangi subduction zone, usually at least one or two per year.

Source: The Hindu

Inland water transport terminal

Why in the news?

Recently, the Union Minister of Ports, Shipping and Waterways inaugurated an Inland Waterways Terminal (IWT) on Brahmaputra in Assam's Jogighopa.

About Inland water transport terminal:

- The terminal is set to transform the connectivity in the region and bolster our trilateral trade with Bhutan and Bangladesh.
- The foundation stone for the terminal was laid in February, 2021.
- It has been set up at a cost of Rs 82 crore.
- It has the potential to boost trade by reducing transportation expenditure and offering an eco-friendly and alternative mode of transport via the Brahmaputra river.
- By 2027, this terminal is expected to handle cargo of 1 million tonnes per annum.

About Inland Waterways Authority of India:

- It is a statutory body established under the Inland Waterways Authority of India Act (IWAI), 1985.
- Purpose: The Authority primarily undertakes projects for development and maintenance of IWT infrastructure on national waterways through grants received from the Ministry of Ports, Shipping and Waterways.
- It presently has five regional offices in Guwahati (Assam), Patna (Bihar), Kochi (Kerala), Bhubaneswar (Odisha) and Kolkata (West Bengal).
- Headquarter: Noida, Uttar Pradesh.
- Nodal



Ministry: Ministry of Ports, Shipping and Waterways.

Source: The Hindu

Caspian Pipeline Consortium (CPC)

Why in the news?

Russia said oil flows through the Caspian Pipeline Consortium (CPC), a major route for supplying Kazakhstan and exporting to the global market, were reduced by 30-40% recently after a Ukrainian drone attack on a pumping station.



About Caspian Pipeline Consortium (CPC):

- CPC is a \$2.6 billion project consisting of a 935-mile crude oil pipeline that runs from the Tengiz oil field in Kazakhstan to the Russian Black Sea port of Novorossiysk.

- Construction on the CPC pipeline began in 1999.
- It was commissioned in 2001, and a \$5.1 billion expansion project was completed in 2018.
- It is a key East-West pipeline that will carry oil from the Caspian Sea region to international markets.
- CPC includes the Russian and Kazakh governments, as well as Western energy majors - Chevron, ExxonMobil and Shell.

- This pipeline accounts for two-thirds of Kazakhstan's oil exports.
- The pipeline's total capacity is 1.4 million barrels per day of oil. This is 3 percent of global seaborne oil trade.

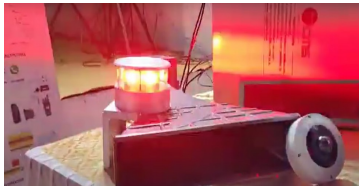
Source: The Hindu

CLIMATE

KaWaCHaM

Why in the news?

Recently, the Kerala Government launched KaWaCHaM, one of the world's fastest weather alert systems.



About KaWaCHaM:

- 'KaWaCHaM' stands for Kerala Warnings Crisis and Hazards Management System, and the word kavacham in Malayalam translates to 'shield', symbolising protection.
- It is an advanced disaster warning system that integrates alerts, sirens and global weather models to improve the State's early disaster preparedness and public safety.
- It is designed to enhance rescue and rehabilitation efforts during extreme weather events driven by climate change.
- It has been developed with funding from the National Disaster Management Authority and the World Bank as part of the National Cyclone Risk Mitigation Project.

Key features of KaWaCHaM:

- It includes hazard assessment, alert issuance and action planning according to threat levels.
- It aims to install 126 sirens and strobe lights on tall towers, government buildings and schools.
- Each siren has three colours—red, yellow and orange—in the strobe light and is equipped with eight loudspeakers.
- These sirens can broadcast warnings up to 1,200 metres away and provide essential information about emergency camps and safety precautions.
- The system will include pre-recorded voice messages and audio alerts to provide various warnings.
- Under the project, the State integrates all early warning systems into a framework that disseminates knowledge, issues warnings, monitors developing crises and ensures responses.

Working of the KaWaCHaM :

- KaWaCHaM collects data from various sources, including weather networks such as India Meteorological Department, INCOIS and CWC, private and public agencies, social media networks and the Internet.
- The warnings will cover sea attacks, heavy rainfall, strong winds and extreme heat.
- It is headed by the state emergency operation centre, will operate at the taluk

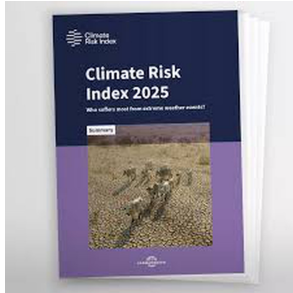
(subdistrict) level and cover all vulnerable areas.

Source: Down to earth

Climate Risk Index

Why in the news?

According to a new Climate Risk Index report, India ranks sixth among the top 10 countries most affected by extreme weather events over the last three decades from 1993-2023.



About Climate Risk Index:

- It has been published since 2006.
- It is one of the longest running annual climate impact-related indices.
- It analyses climate-related extreme weather events' degree of effect on countries.
- This backward-looking index ranks countries by their economic and human impacts (fatalities as well as affected, injured, and homeless) with the most affected country ranked highest.
- The findings of the report are based on extreme weather event data from the International Disaster Database (Em-dat) and

socio-economic data from the International Monetary Fund (IMF).

- It is published by Germanwatch, an independent development, environmental, and human rights organisation based in Bonn and Berlin.

Highlights of the Index:

- India is among the 10 countries most affected by extreme weather events between 1993 and 2022, accounting for 10% of global fatalities caused by such events, and 4.3% of the damage (in dollar terms).
- It is ranked sixth in the Climate Risk Index, 2025, highlighting its vulnerability to the climate crisis.
- Dominica, China, Honduras, Myanmar, and Italy are ranked ahead of India.
- India faced more than 400 extreme events, causing \$ 180 billion in losses, and at least 80,000 fatalities.
- India was affected by floods, heatwaves, and cyclones during the period. It experienced devastating floods in 1993, 1998, and 2013, along with severe heat waves in 2002, 2003, and 2015.

Source: Down to earth

HISTORY

Kalyana Chalukyas

Why in the news?

Three Kannada inscriptions from the Kalyana Chalukya era were noticed for the first time in Kankal village in the Pudur mandal of Vikarabad district.



About Kalyana Chalukyas:

- The Chalukyas ruled over the Deccan plateau between the 6th and 12th centuries.
- During that period, they ruled as three closely related but individual dynasties - the Chalukyas of Badami, the Chalukyas of Kalyani (Western Chalukyas) and the Chalukyas of Vengi (Eastern Chalukyas).

Kalyana Chalukyas:

- Primarily a Kannadiga dynasty, they were known after their capital city, Kalyani. It is present in the modern-day Bidar district of Karnataka.
- The empire was established by Tailapa II when the Western Chalukya was a feudatory of the Rashtrakuta Empire and Tailapa II governed Tardavadi in the Bijapur district of Karnataka.

- In the 300 years long rule in the western Deccan and southern part of the Indian peninsula, Chalukya of Kalyani expanded and reached the zenith of power during the rule of Vikramaditya VI (1076-1126 CE).
- It is considered the most successful period of the later Chalukya rulers in Karnataka's history, and many scholars refer to this period as the 'Chalukya Vikrama era'.
- Vikramaditya VI was not only controlling feudatories in the northern region, such as Kadamba Jayakesi II of Goa, Silhara Bhoja and the Yadava King, but also, he won several battles against the Chola dynasty.

Decline:

- After Vikramaditya VI's death, the consistent confrontation with the Chola dynasty exploited both empires and gave opportunities to their subordinates to rebel.
- After 1126, the Western Chalukya empire started declining, and by the time of Jagadhekamalla II, everything was falling apart.

Administration, Art, and Architecture:

- The Western Chalukya administration was mainly hereditary, where the king passed his powers to the male heir and brother in the absence of a male heir.
- The whole kingdom was divided and managed by feudatories such as the Hoysala and the Kakatiya.

- While the Chalukya Dynasty maintained a great army of infantries, cavalries, elephant units, etc, the Western Chalukyas followed the trend and achieved a great extent of power.
- They were primarily Hindus but also acknowledged and tolerant of Buddhism and Jainism.
- They contributed greatly to the development of Kannada and Telugu literature.
- The Western Chalukya minted punch-marked gold coins called pagodas with Kannada legends.
- The Western Chalukya dynasty is considered to be a crucial era for the evolution of Deccan architecture.
- Their art is also called the 'Gadag style' because numerous temples were built in the Tungabhadra-Krishna doab region in the present-day Gadag district.
- The Mallikarjuna temple of Bellary, Siddeshvara temple in Haveri, Kallesvara temple in Davangere district, etc are a few of the finest examples of later Chalukya architecture.

Source: The Times of India

Nagoba Jatara

Why in the news?

Nagoba Jatara, the eight-day holy pilgrimage event of Mesram clan Adivasi Gonds, is slated to start at Keslapur village in north Telangana's tribal heartland of Indervelli mandal in Adilabad district.



About Nagoba Jatara:

- It is a tribal festival held in January/February in Keslapur village, Adilabad district,
- It is the second biggest tribal festival in India, after the Sammakka Saralamma Jatara, held also in Telangana.
- It is celebrated for 10 days by the Mesaram clan of Gond tribes.
- Tribal people from Maharashtra, Chhattisgarh, Odisha, Karnataka, Jharkhand and Madhya Pradesh belonging to the Mesaram clan offer prayers at the festival.
- The chief deity at the festival is the 'Nagoba' (Sri Shek – Cobra).

Rituals of the festival :

- Few elder members of the Mesram clan go barefoot to the River Godavari a few days before the Jatara, bring holy water, and keep it near the Banyan Tree in front of the Nagoba Temple.
- The Jatara includes a 'Bheting' ceremony, where new brides are introduced into the clan. New brides come in possession wearing white saris and are led by the elder women to worship the Nagoba, after which they are recognized as a full-fledged member of the clan.

- The Gusadi Dance performance by dancers from the Gond tribe is a major special attraction of the event.

Source: The Hindu

Lezim Dance

Why in the news?

Recently, a scene of Lezim dancing in the upcoming Bollywood film Chhava, based on the life of Maratha ruler Chhatrapati Sambhaji Maharaj, has led to controversy in Maharashtra.



About Lezim Dance:

- It is a folk dance from
- It gets its name after a musical instrument - a unique wooden stick, with jingling cymbals attached to it that the dancers carry while performing the dance. The dance is accompanied by a dhol or dhalgi (small dhol).
- Lezim is a kind of musical instrument which was traditionally used in all folk dances but today it is primarily used in Ganesha procession.
- Lezim dance is a rigorous physical exercise in which the formations are in twos and fours and sometimes even a circle.
- There are no winds or string instruments accompanying it, often there is no song accompaniment either, but sometimes, a song can be sung.

Who was Chhatrapati Sambhaji Maharaj?

- He was the eldest son of Chhatrapati Shivaji Maharaj.
- He came to power following a bloody succession battle with his half-brother Rajaram in 1681.
- The Mughal emperor Aurangzeb (1618-1707) was his contemporary whose plan to extend the Mughal empire towards the Deccan often resulted in clashes with the Marathas.

Source: Indian Express

SAFTA

Why in the news?

Recently, the Solvent Extractors' Association of India (SEA) has requested the Government to regulate the inflow of edible oils from Nepal and other SAARC countries due to misuse of SAFTA norms.



About SAFTA:

- It is the free trade arrangement of the South Asian Association for Regional Cooperation (SAARC).
- The agreement came into force in 2006, succeeding the 1993 SAARC Preferential Trading Arrangement.
- SAFTA signatory countries: Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka.
- SAFTA recognizes the need for special and differential treatment for LDCs in its preamble.
- The objectives of this Agreement are to promote and enhance mutual trade and economic cooperation among Contracting States by, inter-alia:
- Eliminating barriers to trade in, and facilitating the cross-border movement of goods between the territories of the Contracting States;
- Promoting conditions of fair competition in the free trade area, and ensuring equitable benefits to all Contracting States, taking into account their respective levels and pattern of economic development;
- Creating effective mechanism for the implementation and application of this Agreement, for its joint administration and for the resolution of disputes; and
- Establishing a framework for further regional cooperation to expand and enhance the mutual benefits of this Agreement.

Source: The Hindu businessline

UK-India Young Professionals Scheme

Why in the news?

The ballot for this year's United Kingdom-India Young Professionals Scheme (YPS) will open next week.



About UK-India Young Professionals Scheme:

- It was conceived as part of an India-U.K. Migration and Mobility MoU signed in May 2021 and was announced in November at the 2022 G20 summit in Bali.
- It was formally launched in February 2023.

Features of the Scheme:

- It allows Indian citizens between 18 and 30 years old to live and work in the UK for up to 2 years.
- It will enable candidates to enter the UK at any time while their visa is valid and leave and return anytime during their stay.

Eligibility to get Visa under this initiative:

- One has to be an Indian national aged between 18 and 30 years.
- One must have a bachelor's degree or above.
- One must have 2,530 pounds in savings.
- One must not have any children under the age of 18 who live with you or whom you are financially supporting.
- A person must be selected in the India Young Professionals Scheme ballot before s/he can apply for a Young Professionals Scheme visa.
- S/he cannot apply if already been in the UK under this scheme or the Youth Mobility Scheme visa.
- In case the applicant is issued a visa, she must enter the UK within six months of the date on which the visa was issued.

Once in the UK, the applicant can:

- Study -for certain degree programs, such as post-graduation or research in sensitive subjects in the UK, an additional certificate under the Academic Technology Approval Scheme (ATAS) needs to be applied before starting the course or research.
- Be self-employed and set up a company - as long as the premises are rented, equipment is

not worth more than £5,000 and does not have any employee

Source: Indian Express

U.S.-India COMPACT Initiative

Why in the news?

Recently, the President of the USA and Prime Minister of India launched the U.S.-India COMPACT initiative.



About the U.S.-India COMPACT Initiative:

- The Catalyzing Opportunities for Military Partnership, Accelerated Commerce & Technology (COMPACT) initiative will drive transformative change across key pillars of cooperation.
- It is a framework that will lay the foundation for deepening military partnerships, with a clear focus on technology, trade, and defence industrial cooperation.
- Under this initiative, they committed to a results-driven agenda with initial outcomes this year to demonstrate the level of trust for a mutually beneficial partnership.

Key features of COMPACT Initiative:

- New Defence Procurements & Regulatory Reforms: A new ten-year Framework for the US-India Major Defense Partnership, with the US pledging additional defence sales and co-production initiatives.
- Advancing Defence Technologies & Military Collaboration: To accelerate cooperation in space, air defence, missile systems, maritime, and undersea operations. The launch of the Autonomous Systems Industry Alliance (ASIA) will spur innovation in AI-enabled counter-UAS and maritime defence.
- Economic & Trade Expansion: Under this component both countries aim to double bilateral trade to \$500 billion by 2030 under “Mission 500.” They plan to negotiate the first phase of a Bilateral Trade Agreement by fall 2025, focusing on fair trade, national security, and job creation.
- Strengthening Technology & Innovation Ties: The launch of the US-India TRUST initiative

will boost cooperation in defence, AI, semiconductors, quantum computing, biotechnology, energy, and space.

- Boosting Space Cooperation & Critical Minerals Partnership: To deepen space collaboration includes the introduction of INDUS Innovation, inspired by the INDUS-X platform, which will drive academic and industrial partnerships in space and emerging tech.
- Space Collaboration in 2025: NASA and ISRO partner via AXIOM to send the first Indian astronaut to the ISS and expedite the NISAR dual-radar satellite launch.

Source: Financial Express

OPEC+

Why in the news?

Recently, Brazil's government approved the country's entry into OPEC+, the alliance of major oil-exporting nations.



About OPEC+:

- It is a group of 22 oil-exporting countries which meets regularly to decide how much crude oil to sell on the world market.
- These nations aim to work together on adjusting crude oil production to bring stability to the oil market.
- Origin: These nations came to an accord towards the end of 2016 “to institutionalize a framework for cooperation between OPEC and non-OPEC producing countries on a regular and sustainable basis.”
- At the core of this group are the 12 members of OPEC (the Organization of the Oil Exporting Countries), which are mainly Middle Eastern and African countries.
- Members: It comprises 12 OPEC countries plus Azerbaijan, Bahrain, Brunei, Kazakhstan, Russia, Mexico, Malaysia, South Sudan, Sudan, and Oman.

What is OPEC?

- It is a permanent intergovernmental organization of oil-exporting countries.

- It was established in 1960 by the five founding members Iran, Iraq, Kuwait, Saudi Arabia, and Venezuela.
- Currently, it has 12 members, including Algeria, Congo, Equatorial Guinea, Gabon, Libya, Nigeria and the United Arab Emirates.
- Angola withdrew its membership effective 1 January 2024.
- Headquarters: Vienna, Austria.

Source: The Times of India

International Organization of Aids to Marine Navigation

Why in the news?

Recently, India elected to the Vice Presidency of the International Organization of Aids to Marine Navigation (IALA) in Singapore.



About International Organization of Aids to Marine Navigation:

- It was established in 1957 as a Non-Governmental Organisation (NGO).
- It officially changed its status from a Non-governmental Organization (NGO) to an Intergovernmental Organization (IGO) based on a Convention ratified by 34 States in 2024.
- Its mandate is to harmonise global maritime navigation systems, promote maritime safety initiatives, and collaborate with member states, international organizations, and industry stakeholders to address emerging challenges in maritime safety and environmental protection.
- Members: It comprises 200 members, 80 of which are national authorities and 60 are commercial firms. India has been a member of this organization since 1957.
- Headquarters: Saint-Germain-en-Laye, France.

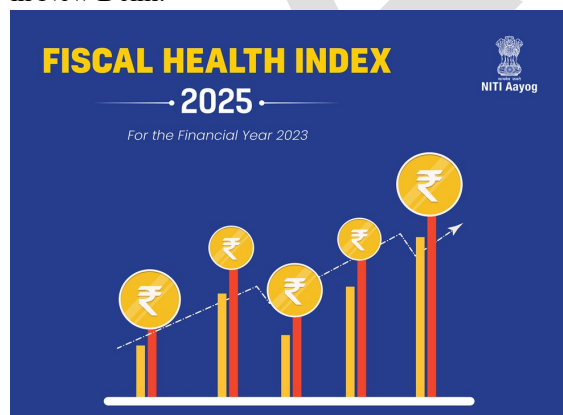
Source: PIB

INDIAN ECONOMY

Fiscal Health Index 2025

Why in the news?

Recently, the Chairman of the 16th Finance Commission launched the inaugural issue of NITI Aayog's report titled "Fiscal Health Index (FHI) 2025" in New Delhi.



About Fiscal Health Index:

- It provides a comprehensive assessment of the fiscal health of 18 major States of India.
- It is based on five key sub-indices: Quality of Expenditure, Revenue Mobilisation, Fiscal Prudence, Debt Index and Debt Sustainability,

along with insights into state-specific challenges and areas for improvement.

- It aims to throw light on the fiscal status at the sub-national level and guide policy reforms for sustainable and resilient economic growth.
- It has been developed using data from the Comptroller and Auditor General (CAG).

Key Highlights of the Report:

- With a cumulative score of 67.8, Odisha tops the ranking, followed by Chhattisgarh and Goa with scores of 55.2 and 53.6, respectively.
- The achiever States display strong fiscal health, excelling in revenue mobilization, expenditure management, and debt sustainability.
- Improvements are seen in States like Jharkhand, which has strengthened fiscal prudence and debt sustainability, while Karnataka faces a decline due to weaker performance in expenditure quality and debt management.
- These interstate disparities highlight the need for targeted reforms to address specific fiscal challenges and ensure sustainable growth.
- Punjab, Andhra Pradesh, West Bengal and Kerala were the worst-performing States in the

Fiscal Health Index (FHI), each facing significant fiscal challenges, and listed under the “aspirational” category.

- It has listed Maharashtra, Uttar Pradesh, Telangana, Madhya Pradesh, Karnataka under the “front-runners” category.
- Tamil Nadu, Bihar, Rajasthan, and Haryana were classified as performers.

Source: PIB

Reserve Bank-Integrated Ombudsman Scheme

Why in the news?

The Reserve Bank of India (RBI) resolved 95 per cent of complaints received under the Reserve Bank-Integrated Ombudsman Scheme (RB-IOS) between April 1, 2023, and March 31, 2024.



About Reserve Bank-Integrated Ombudsman Scheme:

- It was launched on November 12, 2021.
- It adopts the ‘One Nation - One Ombudsman’ approach by making the RBI’s Ombudsman mechanism jurisdiction neutral.
- It integrates the erstwhile three Ombudsman schemes of RBI namely: the Banking Ombudsman Scheme, 2006, the Ombudsman Scheme for Non-Banking Financial Companies, 2018 and the Ombudsman Scheme for Digital Transactions, 2019.

Features of Scheme:

- It defines ‘deficiency in service’ as the ground for filing a complaint, with a specified list of exclusions. A deficiency of service is a shortcoming or an inadequacy in the financial service or some other service related to it that the Regulated Entities (RE) is supposed to provide.
- A Centralised Receipt and Processing Centre has been set up at RBI, Chandigarh, for receipt and initial processing of physical and email complaints in any language.
- The regulated entity will not have any right to appeal in cases where an award is issued by the ombudsman against it for not furnishing satisfactory and timely information.

- Banks covered: It covers all commercial banks, Non-Banking Financial Companies (NBFCs), RRBs, Payment System Participants, most Primary (Urban) Cooperative Banks with a deposit size of ₹50 crore and Credit Information Companies.

Source: Indian Express

When-listed’ Platform

Why in the news?

The Securities and Exchange Board of India (Sebi) is looking to launch a ‘when-listed’ platform.



About ‘When-listed’:

- It has been launched for trading of shares of companies that have finished their Initial Public Offering (IPO) and are yet to be listed on stock exchanges.
- It is aimed at reducing the activity in the grey market, which is unregulated and has a significant influence on listings.
- Present timeline of listing shares in India:
 - Once the IPO is closed, shares have to be listed on trading platforms in trading plus three working days (T+3), with T being the closing day of the offer. The allotment of shares is done on T+1 day.
 - In the period between the allotment of shares and listing day, investors trade in the grey market.

What is Grey Market?

- It refers to an unofficial trading of securities even before they are listed on a stock exchange. This is an unregulated market and works on demand and supply.
- Many investors look at the premium offered in the grey market for stock of a company which has launched an IPO, before considering investing in the offer

Source: The Hindu

Mutual Credit Guarantee Scheme

Why in the news?

Recently, the central government approved the Mutual Credit Guarantee Scheme for micro, small and medium

enterprises (MCGS-MSMEs), guaranteeing loans up to ₹100 crore.



About Mutual Credit Guarantee Scheme:

- It will provide 60 percent guarantee coverage by the National Credit Guarantee Trustee Company Limited (NCGTC) to Member Lending Institutions (MLIs) for financing the eligible MSMEs, needed to purchase the equipment/machinery.
- The Scheme will be applicable to all loans sanctioned under MCGS-MSME during the period of 4 years from the date of issue of operational guidelines of the scheme or till cumulative guarantee of Rs. 7 lakh crores are issued, whichever is earlier.

Salient Features of the Scheme:

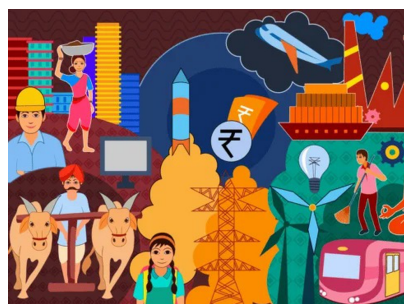
- Borrower should be an MSME with valid Udyam Registration Number;
- It provides a loan guarantee up to Rs 100 crore, with a minimum of 75 percent of the project cost allocated for equipment or machinery.
- Under the scheme for loans up to 50 crore shall have repayment period of up to 8 years with up to 2 years moratorium period on principal installments.
- For loans above 50 crore, higher repayment schedule and moratorium period on principal installments can be considered.
- Upfront (initial) contribution of 5% of the loan amount shall be deposited at the time of application of guarantee cover.
- Annual Guarantee Fee on loan under the Scheme shall be Nil during the year of sanction. During the next 3 years, it shall be 1.5% p.a. of loan outstanding as on March 31 of previous year. Thereafter, Annual Guarantee Fee shall be 1% p.a. of loan outstanding as on March 31 of previous year.

Source: PIB

MSME Trade Enablement and Marketing (TEAM) Initiative

Why in the news?

Recently, the Ministry of Micro, Small, and Medium Enterprises, in partnership with the Open Network for Digital Commerce (ONDC), has announced the launch of an initiative to enable small and micro enterprises to join ONDC.



About the MSME TEAM Initiative:

- It has been launched under the "Raising and Accelerating MSME Productivity (RAMP)" Programme.
- It is aimed to enable MSMEs to embrace digital commerce and expand their market presence.
- Funding: The initiative has a budget of ₹277.35 crore over 3 years.
- Targeted beneficiaries: It will cover 5 lakh micro and small enterprises, with 50 per cent of these being women-led businesses.
- Over 150 workshops will be held across Tier 2 and Tier 3 cities, targeting key MSME clusters, with special attention to women and SC/ST-led enterprises.
- Significance: These workshops will guide businesses through the process of joining the ONDC Network, creating compliant digital catalogues and using the ecosystem to its full potential.
- It will focus on:
 - Connecting MSMEs with the ONDC Network
 - Providing access to digital storefronts, integrated payment systems and logistics support
 - Reducing operational barriers and helps businesses tap into wider customer bases
 - Formalizing operations and establishing digital transaction histories, which will enhance the credibility and trust of participating MSMEs

Source: The Hindu Business line

Controlled Cannabis Cultivation

Why in the news?

Recently, the Himachal Pradesh Cabinet approved a pilot study by two universities on the controlled cultivation of cannabis for medicinal and industrial purposes.



About Controlled Cannabis Cultivation:

- It is the regulated cultivation of specific cannabis varieties having minimal intoxicating properties, along with strict monitoring to prevent misuse. Such varieties are commonly known as
- The tetrahydrocannabinol (THC) cannabinoid content (a kind of chemical that has an intoxicating effect) in controlled cannabis should be less than or equal to 3 per cent.
- Under this, authorities focus on its non-narcotic applications, particularly in the pharmaceutical and industrial sectors.
- Uses of Hemp: Hemp's stalks, leaves, and seeds can also be converted into textile, paper, food, cosmetics, biofuel and more. Additionally, cannabidiol (CBD) compounds in the plant are effective in treating chronic pain.

Laws related to cannabis cultivation in India

- Cannabis cultivation is largely prohibited in India due to its psychoactive properties.
- Section 2 of the Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985, prohibits the production and sale of cannabis resin and flowers.
- It defines charas as the separated resin, in any form (crude or purified), obtained from the cannabis plant. It also includes concentrated preparations such as hashish oil or liquid hashish.
- However, it provides exceptions for cannabis cultivation and use for industrial and medicinal purposes under government regulation.
- Section 10 of the Act allows state governments to regulate, permit, or prohibit cannabis cultivation for medicinal and scientific purposes.
- Additionally, Section 14 grants the Central government the power to authorise and regulate cannabis cultivation for research or other approved purposes.

Source: Indian Express

Household Consumption Expenditure Survey

Why in the news?

Recently, the Ministry of Statistics and Programme Implementation (MoSPI) published the summary findings of the second of the two consecutive surveys on household consumption expenditure survey.



About Household Consumption Expenditure Survey (HCES):

- It is designed to collect information on the consumption and expenditure of households on goods and services.
- The survey provides data required to assess trends in economic well-being and to determine and update the basket of consumer goods and services and weights used for the calculation of the Consumer Price Index. Data collected in HCES is also used to measure poverty, inequality and social exclusion.
- The Monthly Per Capita Consumption Expenditure (MPCE) compiled from HCES is the primary indicator used for most analytical purposes.

Key Highlights of the Survey

- There is a persistent decline in urban-rural consumption difference across India's major States in 2023-24.
- The average MPCE is on the rise across all Household types in rural and urban Areas.
- Among 18 major states, the difference between urban and rural average monthly per capita expenditure (MPCE) of households is the lowest in Kerala, followed by Punjab, Andhra Pradesh (AP) and Bihar.
- Consumption inequality, both in rural and urban areas, for almost all the 18 major states has declined in 2023-24 from the level of 2022-23.
- At the all-India level, the Gini coefficient of consumption expenditure has declined to 0.237 in 2023-24 from 0.266 in 2022-23 for rural areas and to 0.284 in 2023-24 from 0.314 in 2022-23 for urban areas.

Source: PIB

RBI's Digital Payments Index

Why in the news?

The Reserve Bank of India's (RBI) digital payments index (DPI) rose to 465.33 as of September 2024, compared to 445.5 in March 2024, reflecting the rapid adoption of digital payments in the country.



About RBI's Digital Payments Index:

- It is a first-of-its kind index to measure the spread of digital payments across the country. It has been constructed by the RBI.
- It was launched in January 2021.
- Base Year: It has been constructed with March 2018 as the base period, i.e., the DPI score for March 2018 is set at 100.
- The DPI index comprises five broad parameters that enable the measurement of deepening and penetration of digital payments in the country over different time periods. The parameters include:
 - Payment enablers (25 percent weightage in the index)
 - Payment Infrastructure Demand-side factors (10 percent)
 - Payment Infrastructure Supply-side factors (15 percent)
 - Payment performance (45 percent)
 - Consumer centricity (5 percent)
- Each of the parameters has sub-parameters, which, in turn, consist of various measurable indicators.

Source: Business standard

Small Modular Reactors (SMRs)

Why in the news?

The Finance Minister recently announced a ₹20,000 crore 'Nuclear Energy Mission' to develop indigenous Small Modular Reactors (SMR).



About Small Modular Reactors (SMRs):

- SMRs are defined as small nuclear reactors with a maximum output of 300 Megawatt electric (MWe) and which can produce 7.2 million kWh per day.
- By comparison, large-size nuclear power plants have an output of over 1,000 MWe and can produce 24 million kWh per day.

- SMRs, which can produce a large amount of low-carbon electricity, are:
 - Small – physically a fraction of the size of a conventional nuclear power reactor.
 - Modular – making it possible for systems and components to be factory-assembled and transported as a unit to a location for installation.
 - Reactors – harnessing nuclear fission to generate heat to produce energy.

Advantages:

- Relatively small physical footprints;
- Reduced capital investment;
- Can be factory-built, unlike the conventional nuclear reactors that are built on-site;
- Ability to be sited in remote locations, not possible for larger nuclear plants;
- Provisions for incremental power additions;
- Power plants based on SMRs may require less frequent refueling, every 3 to 7 years, in comparison to between 1 and 2 years for conventional plants.
- Some SMRs are designed to operate for up to 30 years without refueling.
- It also offers distinct safeguards, security and non-proliferation advantages.
- They are well suited to be integrated into energy hubs in combination with other sources of energy.
- They are adapted to supply electricity and additionally capable of supplying heat for industrial applications, district heating, as well as for the production of hydrogen.

Source: The Hindu

Grameen Credit Score

Why in the news?

Recently, the finance minister of India announced Grameen credit score scheme in the union budget 2025.



About Grameen Credit Score:

- It aims to formalize self-help group (SHG) transactions within the central credit system of India, thereby allowing leading financial institutions to better assess creditworthiness.

- The objective behind this scheme is to promote financial inclusion for self-help group (SHGs) women entrepreneurs.
- It is basically to provide them the much-needed support to grow in life by trying to build businesses.
- This score, hence, represents a significant shift in analysing the creditworthiness of millions of women involved in the SHGs across India's rural areas.
- The introduction of the Grameen credit score is expected to bring several positive changes:
 - Enhanced financial access: It will open up new financial opportunities for rural women. Thus, enabling them to expand their businesses and improve their livelihoods. It will also introduce them with concepts like credit cards, creditworthiness, loan EMIs, loan repayment etc.
 - Customized financial products: It will be supplemented by customized credit cards for micro-enterprises, with limits of up to ₹5 lakh. This will propel grassroot level financial empowerment.
 - Improved credit assessment: By providing a digital framework for assessing creditworthiness, it will bridge existing gaps in the current credit bureau system, which often overlooks SHG members. It will also allow them to check their credit score, credit limits and ways to improve the same.
 - Economic stability: Now with increase in credit availability women led SHGs will be in a position to better contribute more effectively to their houses. This will propel the grow

Source: Livemint

Algorithmic Trading

Why in the news?

Recently, the Securities and Exchange Board of India (SEBI) has mandated stock exchanges to empanel algorithmic trading providers and has also defined rules for using application programming interfaces (APIs).



About Algorithmic Trading:

- It is a method of executing trading orders by providing a predefined set of rules to a computer program.
- This helps in placing share orders at a speed and frequency not possible for human traders.
- Algo trading is already prevalent in India among both institutional as well as retail investors.

New Algo Trading Framework by SEBI:

- It is aimed at spelling out the rights and responsibilities of the main stakeholders of the trading ecosystem such as investors, brokers, algo providers/vendors and Market Infrastructure Institutions (MIIs) so that the retail investors can avail algo facilities with requisite safeguards.
- Under the framework, retail investors will get access to the approved algos only from the registered brokers.
- The facility of algo trading would be provided by the stock broker only after obtaining requisite permission from the stock exchange for each algo.
- All algo orders shall be tagged with a unique identifier provided by the exchange in order to establish audit trail and the broker shall seek approval from the exchange for any modification or change to the approved algos."
- Brokers will be solely responsible for handling investor grievances related to algo trading and the monitoring of APIs for prohibited activities.
- Algos will be categorised into two categories:
 - White box algos, where logic is disclosed and replicable i.e. execution algos.
 - Black box algos, where the logic is not known to the user and is not replicable.

Source: The Economic Times

Asian Fisheries and Aquaculture Forum

Why in the news?

The 14th Asian Fisheries and Aquaculture Forum (14 AFAF) is being organized in New Delhi during February 12-14, 2025.



About Asian Fisheries and Aquaculture Forum:

- It is a triennial event of the Asian Fisheries Society which has a strong legacy of fostering global collaboration in the sector.
- Since its inception, the forum has been successfully hosted in multiple countries across Asia.
- This prestigious event is being hosted in India for the 2nd time after the 8AFAF held at Kochi in 2007.
- The forum will provide a platform to showcase India's contributions, strengthen international partnerships and promote innovative approaches for sustainable, resilient, and economically viable fish production systems.
- With a rapidly expanding blue economy, progressive government policies and significant scientific advancements, India has emerged as a key player in sustainable fisheries and aquaculture.
- Today, India occupies 2nd position in total fish production and also aquaculture production globally.
- Headquarters: Kuala Lumpur, Malaysia.

Key facts about 14th AFAF:

- It has brought together key players from the fisheries and aquaculture sectors and will host around 1,000 delegates from 24 countries, including researchers, policymakers, industry leaders, and stakeholders.
- Theme of 14th AFAF: "Greening the Blue Growth in Asia-Pacific"
- It is being jointly organized by the Asian Fisheries Society (AFS), Kuala Lumpur; Indian Council of Agricultural Research (ICAR), New Delhi; the Department of Fisheries (DoF), Government of India; and the Asian Fisheries Society Indian Branch (AFSIB), Mangalore.

Source: PIB

Market Intervention Scheme

Why in the news?

Recently, the central government has revised the Market Intervention Scheme (MIS) guidelines.



About Market Intervention Scheme:

- It is implemented on the request of the State/UT Government for procurement of various perishable agricultural/horticultural commodities such as tomato, onion and potato etc. for which Minimum Support Price (MSP) is not applicable.
- It is implemented only when there is a minimum reduction of 10% in the prevailing market price as compared to the previous normal year.

Revised Market Intervention Scheme Guidelines:

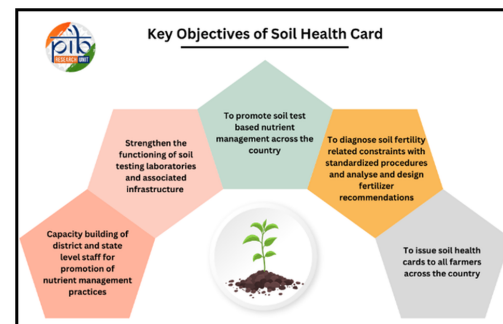
- It made MIS a component of the integrated scheme of PM-AASHA.
- The procurement/coverage limit of production quantity of crops has been increased from the existing 20 percent to 25 percent.
- The States have also been given the option to pay the difference between the Market Intervention Price (MIP) and the selling price directly into the bank account of the farmers in place of physical procurement.
- Reimbursement: The operational cost incurred in storage and transportation of crops from the producing State to other consuming States will be reimbursed by Central nodal agencies like NAFED and NCCF, in the interest of farmers.

Source: Business Standard

Soil Health Card Scheme

Why in the news?

Recently, the soil health card scheme has completed its decade.



About Soil Health Card Scheme:

- The soil health card scheme was launched in 2015 to assist State Governments to issue soil health cards to all farmers.
- It provides information to farmers on nutrient status of their soil along with recommendations on appropriate dosage of nutrients to be applied for improving soil health and its fertility.
- Nodal Agency: Department of Agriculture and Farmers Welfare in (DA & FW).

Key features of the scheme:

- It contains status of the soil with respect to 12 parameters, namely N, P, K, S (Macronutrients); Zn, Fe, Cu, Mn, Bo (Micro - nutrients); and pH (Acidity or Basicity), EC (Electrical Conductivity) and OC (Organic Carbon).
- Soil samples are taken generally two times in a year, after harvesting of Rabi and Kharif Crop respectively or when there is no standing crop in the field.
- A farmer will get the soil card once every 3 years.
- Village Level Soil Testing Labs can be set up to provide test results by individual entrepreneurs i.e. rural youth and community based entrepreneurs, including Self Help Groups (SHGs), Schools, Agriculture Universities etc.
- Soil Health Card scheme has been merged in Rashtriya Krishi Vikas Yojana (RKVY) scheme as one of its components under the name 'Soil Health & Fertility' from the year 2022-23.
- Technological Advancements: To streamline the implementation/monitoring of the scheme and to provide easy access to Soil Health Card to the farmers, SHC Mobile App has been built with additional features.

Benefits of the scheme:

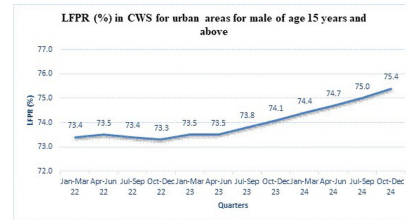
- The scheme monitors the soil of the farmers well and gives them a formatted report. So, they can decide well which crops they should cultivate and which ones they should skip.
- The authorities monitor the soil on a regular basis. One in every 3 years, they provide a report to farmers. So farmers need not worry if the nature of the soil changes due to certain factors. Also, they always have updated data about their soil.

Source: PIB

Periodic Labour Force Survey (PLFS)

Why in the news?

Unemployment rate in urban areas during the third quarter (October-December) of FY25 remained unchanged at 6.4 per cent compared to the preceding quarter, according to the latest quarterly Periodic Labour Force Survey (PLFS) data.



Key Findings of the survey:

- Labour Force Participation Rate (LFPR) in urban areas among persons of age 15 years and above has increased from 49.9% during October - December, 2023 to 50.4% in quarter October - December, 2024.
 - LFPR for male of age 15 years and above in urban areas increased from 74.1% during October - December, 2023 to 75.4% during October - December, 2024 reflecting the overall increasing trend in male LFPR.
- LFPR among females of age 15 years and above for urban areas increased from 25.0% during October - December, 2023 to 25.2% during October - December, 2024.
- Worker Population Ratio (WPR) in urban areas among persons of age 15 years and above has increased from 46.6% during October - December, 2023 to 47.2% in October - December, 2024.
 - WPR for male of age 15 years and above for urban areas increased from 69.8% in October - December, 2023 to 70.9% during October - December, 2024 reflecting the overall increasing trend in male WPR.
- Unemployment Rate (UR) in urban areas among persons of age 15 years and above decreased from 6.5% during October - December, 2023 to 6.4% during October - December, 2024.
 - UR among males of age 15 years and above remained the same as 5.8% during October - December, 2023 and October - December, 2024. UR among females of age 15 years and above decreased from 8.6 % in October - December, 2023 to 8.1% in October - December, 2024.
- The survey further showed that the jobless rate for the youth (15-29 age group) increased to 16.1 per cent in Q3FY25 from 15.8 per cent in the preceding quarter.

About Periodic Labour Force Survey (PLFS):

- Considering the importance of availability of labour force data at more frequent time intervals, National Sample Survey Office (NSSO) has been conducting the Periodic Labour Force Survey (PLFS) since 2017.

The objectives of the survey:

- Primarily to estimate the key employment and unemployment indicators (viz. Worker Population Ratio, Labour Force Participation Rate, Unemployment Rate) in the short time interval of three months for the urban areas only in the 'Current Weekly Status' (CWS).
- PLFS also estimates employment and unemployment indicators in both 'Usual Status' (ps+ss) and CWS in both rural and urban areas annually.
- This survey is conducted by the National Sample Survey (NSO), working under the Ministry of Statistics and Programme Implementation (MoSPI).

Source: Business Standard

Digital Brand Identity Manual

Why in the news?

Recently, the Ministry of Electronics and Information Technology (MeitY) launched the Digital Brand Identity Manual (DBIM) and the inaugural Chief Information Officer (CIO) Conference 2025.



About Digital Brand Identity Manual:

- It aims to establish a standardized and cohesive digital identity across all government ministries and platforms, enhancing accessibility, inclusivity, and citizen engagement.
- The primary objective of the DBIM is to create a unified and consistent digital brand for the Government of India.
- It is part of the "Gov.In: Harmonisation of Government of India's Digital Footprint" initiative.
- The initiative focuses on simplifying and standardizing government websites, ensuring that citizens from diverse backgrounds can easily navigate and access essential government services.

- By standardizing elements such as color palettes, typography, and iconography, the manual not only ensures uniformity in look and feel but also strengthens the integrity of government-hosted data.
- This cohesive approach will enable government departments to present a compelling and trustworthy brand presence, both nationally and globally.
- The guidelines extend beyond websites to cover mobile applications and social media platforms, reinforcing a seamless user experience across all digital touch points.

Features of DBIM initiative:

- DBIM Toolkit for ensuring uniformity in digital identity
- In CMS Platform for streamlined website management
- Central Content Publishing System (CCPS) for centralized content governance
- Social Media Campaign Guidelines to standardize digital communication

Source: PIB

Dinesh Khara Committee

Why in the news?

The Insurance Regulatory and Development Authority of India (IRDAI) recently set up a seven-member committee headed by former chairman of SBI Dinesh Khara to examine proposed amendments to the Insurance Act, 1938, and suggest a framework for its implementation.



About Dinesh Khara Committee:

- It is a high-powered seven-member committee set up by the Insurance Regulatory and Development Authority (IRDAI).
- Purpose: To review proposed amendments to the Insurance Act of 1938 and recommend a regulatory framework for their implementation.
- The committee is formed as the Union government prepares to introduce the Insurance Amendment Bill to Parliament.
- The proposed amendments include increasing the foreign direct investment (FDI) cap in the insurance sector from 74% to 100%, reducing paid-up capital requirements, introducing a

composite licence system, and streamlining regulatory processes.

- The committee's mandate is strictly limited to reviewing the proposed changes and determining their implementation through regulations and circulars, without suggesting additional amendments.

Insurance Act, 1938:

- It serves as the primary regulatory framework for the country's insurance industry and led to the establishment of IRDAI.
- The Act defines the scope of life, general, and health insurance in the country and regulates the role of insurance agents.
- It regulates the relationship between an insurer, its policyholders, shareholders, and the regulator - IRDAI.

Source: The Times of India

Electronic Personnel License

Why in the news?

Recently, the Union Civil Aviation Minister launched the Electronic Personnel License (EPL) for pilots.



About Electronic Personnel License:

- It is a digital version of a personnel license that will replace traditional physical licenses for pilots.
- It will be securely accessible via the eGCA Mobile Application, ensuring a seamless and transparent process in alignment with the Government of India's "Ease of Doing Business" and "Digital India" initiatives.

- The introduction of EPL follows International Civil Aviation Organization's (ICAO) Amendment 178 to Annex 1 – Personnel Licensing, which encourages Member States to adopt electronic licenses for improved security and efficiency.
- With this advancement, India becomes the second country globally to implement this advanced system, following approval from the International Civil Aviation Organization (ICAO).
- It is implemented by the Directorate General of Civil Aviation (DGCA).

International Civil Aviation Organization:

- It is an intergovernmental specialized agency associated with the United Nations (UN).
- It was established in 1947 by the Convention on International Civil Aviation (1944) known as Chicago Convention.

Functions:

- It is dedicated to developing safe and efficient international air transport for peaceful purposes and ensuring a reasonable opportunity for every state to operate international airlines.
- It sets standards and regulations necessary for aviation safety, security and facilitation, efficiency, and economic development of air transport as well as to improve the environmental performance of aviation.
- It also serves as a clearinghouse for cooperation and discussion on civil aviation issues among its member states.
- It also promotes regional and international agreements aimed at liberalizing aviation markets.
- Headquarters: Montreal, Canada

Source: The Economic Times

Eurodrone Programme

Why in the news?

Recently, India has joined Eurodrone programme as an observer state.



About Eurodrone:

- Eurodrone or Medium Altitude Long Endurance Remotely Piloted Aircraft System (MALE RPAS) is a twin-turboprop MALE Unmanned Aerial Vehicle (UAV).

Features of the Eurodrone:

- It has a maximum mission payload of 2.3 tonnes and an endurance period, maximum time an aircraft can stay in the air using a single load of fuel, of up to 40 hours.
- It offers superior capabilities compared to other existing remotely piloted aircraft systems.
- Equipped with a twin-engine configuration, the drone is designed for operations in diverse environments, including severe weather conditions.
- Uses: It is a remotely piloted aircraft system (RPAS) designed for long-endurance missions such as intelligence, surveillance, target acquisition, and reconnaissance (ISTAR), maritime surveillance, anti-submarine warfare and airborne early warning.
- It is the first RPAS natively designed for integration into civil airspace.

What is Eurodrone Programme?

- It is part of Europe's collective defence strategy, reducing reliance on US and Israeli platforms such as the Reaper and Heron drones, respectively.
- It is a 4-nation development programme of Germany, France, Italy and Spain, led by

the Organisation for Joint Armament Cooperation (OCCAR).

- Airbus Defence and Space (GER) is the Industrial Prime together with Leonardo (ITA), Dassault Aviation (FRA) and Airbus Defence and Space (SPA) acting as Major Subcontractors (MSC).
- Germany takes the role of Lead Nation for the programme.

Source: The Print

Guillain-Barre Syndrome (GBS)

Why in the news?

Around 59 people in Pune have been recently affected with Guillain-Barre Syndrome.

About Guillain-Barre Syndrome (GBS):

- It's a neurological disorder in which the body's immune system attacks the peripheral nervous system.
 - Peripheral nervous system is the part of the nervous system outside the brain and spinal cord.
 - It controls muscle movement, pain signals, and temperature and touch sensations.
- GBS is also called acute inflammatory demyelinating polyradiculoneuropathy (AIDP).
- It can occur at any age, but it most commonly affects people between 30 and 50.



Causes of the Syndrome :

- The exact cause of the disease remains unclear, but it is often observed following a viral or bacterial infection, vaccination or major surgery.
- At such times, the immune system becomes hyperactive, leading to this rare condition.

Symptoms of the Syndrome :

- Patients often begin with an unknown fever, followed by weakness and other nervous system-related symptoms.
- It can increase in intensity over a period of hours, days, or weeks until certain muscles cannot be used at all.
- Some cases of GBS are very mild and only marked by brief weakness. Others cause nearly devastating paralysis, leaving the person unable to breathe on their own.

Treatment of the Syndrome :

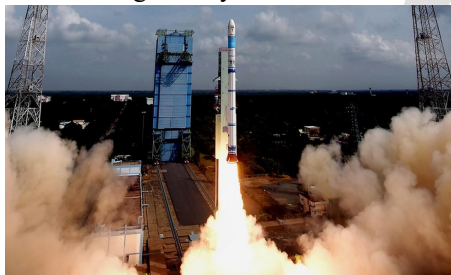
- There is no known cure for this syndrome.
- The most commonly used treatment is intravenous immunoglobulin (IVIG), which is made from donated blood that contains healthy antibodies.
- This helps calm down the immune system's attack on the nerves.

Source: India Today

NVS-02 Satellite

Why in the news?

India's space agency, Indian Space Research Organisation (ISRO), has rolled out its Geosynchronous Satellite Launch Vehicle (GSLV) rocket, carrying the NVS-02 satellite, as part of the NavIC navigation system.



About NVS-02 Satellite:

- It is the second of the 5 second-generation satellites developed by the space agency to replace the existing satellites in the country's navigation constellation Indian Regional Navigation Satellite System.
- It will be placed in a Geosynchronous Transfer Orbit by GSLV-F15.
 - NVS-01 was launched on board GSLV-F12 in 2023 and for the first time, an indigenous atomic clock was flown in NVS-01.
- It will replace an older NavIC satellite, IRNSS-1E, and be positioned at 111.75°E in orbit.
- It is designed, developed, and integrated at the U R Satellite Centre (URSC).

- Significance: By incorporating new L1 band signals, it improves NavIC's compatibility with global navigation systems, ensuring wider adoption and better service.

Features of the Satellite :

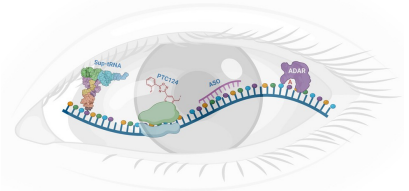
- It is of 2,250 kg and has a power capacity of around 3 kW.
- It is configured with navigation payload in three frequency bands L1, L5 and S bands in addition to ranging payload in C-band like its predecessor-NVS-01
- It also has a precise atomic clock called the Rubidium Atomic Frequency Standard (RAFS) for accurate timekeeping.
- It has a longer lifespan of 12 years and also equipped with indigenously developed, more accurate atomic clocks.

Source: Indian Express

RNA Therapy

Why in the news?

In recent days RNA-based precision therapeutics are emerging as a game-changer for genetic disorders, including inherited retinal diseases (IRDs).



About RNA Therapy:

- It is a term used to describe the use of RNA-based molecules to modulate biological pathways to cure a specific condition.
- Unlike gene-editing therapies, RNA-based therapies offer a safer alternative as they make temporary changes that do not carry over to future generations, reducing the risk of unintended long-term effects.

Applications of RNA based Therapies:

- RNA-editing with ADAR enzymes: It can correct specific genetic mutations at the RNA level. This method has the potential to restore protein production in retinal cells without altering the underlying DNA, offering a new way to treat retinal degenerative diseases caused by single-point mutations.
- Using of suppressor tRNAs: It is to bypass stop-codon mutations, which can prematurely halt protein synthesis in retinal cells. By enabling the production of full-length proteins, this approach could help restore proper retinal function in IRD patients.
- PTC124 Method: It is also known as ataluren, which is already being used to treat patients with cystic fibrosis and Duchenne muscular dystrophy.

- Antisense oligonucleotides (ASOs) have already been used successfully to treat diseases such as spinal muscular atrophy and Duchenne muscular dystrophy.

Source: The Hindu

Silicon carbide

Why in the news?

Researchers at IIT-Madras have tasted success in extracting silicon carbide from (simulated) moon soil.



About Silicon carbide:

- It is a synthetically produced crystalline compound of silicon and carbon.
- Its chemical formula is SiC and it is the most widely used non-oxide ceramic.
- It was discovered by the American inventor Edward G. Acheson in 1891.

Properties of the Silicon carbide:

- It is the hardest ceramic material and has excellent thermal conductivity but low thermal expansion.
- It has excellent mechanical properties and excellent resistance to wear and oxidation.
- It is also classed as a semiconductor, having an electrical conductivity between that of metals and insulating materials.

Applications of the Silicon carbide:

- Its primary application is as an abrasive because of its high hardness, which is surpassed only by diamond, cubic boron nitride, and boron carbide.
- It is a promising ceramic material with excellent thermo mechanical characteristics.
- It is used in refractory linings and heating elements for industrial furnaces, in wear-resistant parts for pumps and rocket engines.
- It is also used in semiconducting substrates for light-emitting diodes.

Source: The Hindu businessline

The Axiom-4 Mission (Ax-4)

Why in the news?

Shubhanshu Shukla, an Indian Air Force (IAF) officer and ISRO astronaut, was recently named the pilot for Axiom Mission 4 (Ax-4).

About Axiom-4 Mission (Ax-4):

- It is the fourth private astronaut mission to the International Space Station (ISS).



- It is organized by Axiom Space in collaboration with
- The Ax-4 crew will launch aboard a SpaceX Dragon spacecraft to the ISS from NASA's Kennedy Space Center in Florida.
- Once docked, the private astronauts plan to spend up to 14 days aboard the ISS.
- During their time aboard the ISS, the crew will conduct scientific experiments, perform technology demonstrations, and engage in educational outreach.
 - Research areas include materials science, biology, Earth observation and more, with the potential to yield groundbreaking discoveries and innovations.
- The mission will send the first Indian astronaut to the station as part of a joint effort between NASA and the Indian space agency.
- The private mission also carries the first astronauts from Poland and Hungary to stay aboard the ISS.

Source: Hindustan Times

National Geospatial Mission

Why in the news?

Recently, the Finance Minister announced the launch of a National Geospatial Mission in the Budget 2025-26.



About National Geospatial Mission:

- This initiative will leverage the existing PM Gati Shakti framework to develop foundational geospatial infrastructure and data, facilitating improved design and execution of infrastructure projects.
- It will be aimed at modernising land records and enhancing urban planning across

- The initiative also aims to address challenges related to land disputes and inefficient land use, which have long hindered growth in various regions.
 - Geospatial refers to data or information that is associated with a specific location on the Earth's surface.
- By creating a robust geospatial database, the government aims to streamline processes involved in land reforms, making them more efficient and transparent.
- This move is anticipated to benefit not only government agencies but also private stakeholders, including geospatial and drone companies, which will likely see increased demand for their services.
- Significance: The National Geospatial Mission is expected to significantly impact various sectors, particularly in urban development and land management.
- The focus on geospatial technology is seen as a critical component in achieving the government's broader goals of improving efficiency and accountability in public services.

Source: India Today

Iran's New Missiles

Why in the news?

Iran recently unveiled two missiles, named Etemad and Ghadr-380.



About Etemad Missile:

- It is a new ballistic missile built by the Iranian Defence Ministry.
- Dubbed Etemad, or "trust" in Persian, it has a maximum range of 1,700 kilometres.
- With a length of 16 meters and a diameter of 1.25 meters, the missile is equipped with a precision-guided warhead.

About Ghadr-380:

- It is an anti-warship cruise missile developed by Iran.
- It has a range of over 1,000 kilometers.

- It has anti-jamming capability.

Ballistic Missile vs. Cruise Missile:

- Ballistic missiles are powered initially by a rocket or series of rockets in stages, but then follow an unpowered projectile trajectory that arches upwards before descending to reach its intended target.
- Ballistic missiles can carry both nuclear and conventional
- Cruise missiles are propelled by jet engines, much like an airplane. They are self-propelled for the majority of their time in the air, flying in a relatively straight line and at lower altitudes, as low as a few meters off the ground.
- Flying low to the surface of the earth, they use more fuel but they are very difficult to detect.

Source: The Times of India

Brucellosis Disease

Why in the news?

Recently, an eight-year-old girl from Kottakkal in Malappuram district of Kerala died after undergoing around two months of treatment for brucellosis.



About Brucellosis Disease:

- It is a bacterial disease caused by various Brucella species, which mainly infect cattle, swine, goats, sheep and dogs.
- Humans can acquire it through direct contact with infected animals, by eating or drinking contaminated animal products or by inhaling airborne agents.
- Most cases are caused by ingesting unpasteurised milk or cheese from infected goats or sheep.
- Human-to-human transmission is very rare, as per the World Health Organization (WHO).
- Symptoms of Brucellosis Disease:
 - Fever, weakness, weight loss, and in general a feeling of discomfort
- In many patients, they can be mild and may not get diagnosed at all.
- The incubation period can vary from one week to two months, but it usually lasts between two and four weeks.

Who is at risk?

- It affects people of all ages.
- The WHO says that people who work with animals and are in contact with their blood, placenta, foetuses and uterine secretions have an increased risk of contracting the disease.
- This method of transmission primarily affects farmers, butchers, hunters, veterinarians and laboratory personnel.
- Treatment: It is usually treated with antibiotics.
- Prevention: Vaccination of cattle, goats and sheep is among the prevention options. Pasteurisation of milk for direct consumption and for creating derivatives such as cheese is an important step to prevent its transmission from animals to humans.

Source: The Hindu

Ranikhet Disease

Why in the news?

Suspected highly virulent Ranikhet disease is said to have caused the death of nearly 1.5 lakh chickens in Eluru, Guntur, Prakasam, and the twin Godavari districts in Andhra Pradesh recently.



About Ranikhet Disease:

- It is a highly contagious viral disease that affects birds, particularly poultry such as chickens, turkeys, and ducks.
- It is caused by infections with virulent Avian avulavirus 1 (AAvV-1), commonly known as Newcastle disease virus (NDV) and designated as avian paramyxovirus-1 (APMV-1).
- It attacks the respiratory, nervous and digestive systems of birds.
- It causes production drops/fertility problems.
- Morbidity is usually high, and mortality varies from 50 to 100 percent.
- It is a minor zoonosis (disease of animals that can also infect humans) and can cause conjunctivitis in humans, but the condition is generally very mild and self-limiting.

Transmission of the Disease:

- Direct contact with secretions, especially faeces, from infected birds

- Contaminated feed, water, implements, premises, human clothing, etc.
- Newcastle disease viruses can survive for several weeks in the environment, especially in cool weather.

Symptoms of the Disease:

- The symptoms vary according to the age of the affected birds.
- The first symptoms usually observed in young birds are sneezing, gasping, and often droopiness. It is in this stage of the disease that the manifestations rather closely resemble those of infections bronchitis.
- Within a short time after the appearance of respiratory symptoms, deaths occur in a flock in quick succession and in increasing numbers from day to day.

Treatment of the Disease:

- At present there is no effective treatment.
- Proper housing and general good care are indicated in an effort to shorten the duration and severity of the infection.

Source: The Times of India

Jevons Paradox

Why in the news?

Recently, Microsoft CEO Satya Nadella discussed Jevons Paradox, noting that improved efficiency in AI may boost its demand and make it a commodity.



About Jevons Paradox:

- It is the idea that technological progress that makes a resource cheaper or more efficient to use often leads to an increase in demand for that resource.
- This refers to a form of induced demand wherein efficiency improvements in the use of a resource causes increased consumption of the resource rather than a decrease in its use.

Origin of Jevons Paradox:

- It was proposed by the English economist, William Stanley Jevons, in his 1865 book The Coal Question.

- Jevons observed that the efficient use of coal made possible by technology actually caused more coal to be extracted and consumed rather than allowing the preservation of existing reserves.
- Technological progress, in other words, only allows people to satisfy demands that could not be satisfied earlier in the absence of an appropriate technology.

Examples of Jevons Paradox:

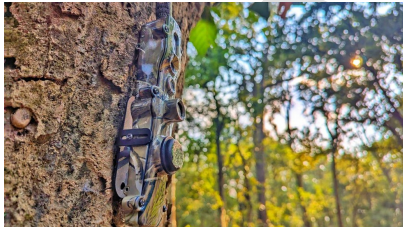
- **Fuel Efficiency and Vehicle Usage:** Vehicle fuel efficiency improvements can also increase consumption. When cars become more fuel-efficient, the cost of driving per mile decreases, making it more affordable for individuals to use their vehicles — often increasing vehicle miles travelled, offsetting any energy conservation benefits from improved fuel efficiency.
- **Digital Technology and Energy Consumption:** The rise of digital technology and the internet has undoubtedly brought numerous benefits to society. Yet, the proliferation of intelligent devices and data centres has substantially increased energy consumption.

Source: Livemint

TrailGuard AI System

Why in the news?

Similipal Tiger Reserve is the first reserve where TrailGuard AI system has shown success as an 'anti-poaching tool'.



About TrailGuard AI System:

- It is an end-to-end, camera-based alert system designed for enhancing wildlife conservation and promoting human-wildlife coexistence in remote areas.
- Its battery lasts for 6 months to one year based on the number of photos it sends
- It autonomously detects target objects, and transmits real-time alerts that can trigger rapid-response to entry by poachers or illegal loggers, wildlife entering agricultural or pastoral lands, or status of endangered or exotic invasive species.

- It transmits human and wildlife activities in remote areas in under 30 seconds, enabling real-time interventions.

Features of the AI system:

- The system combines durable outdoor hardware, on-the-edge AI algorithms, and real-time transmission capabilities, and can be deployed along trails or access points in areas of interest.

Working of TrailGuard AI System:

- They operate on a low-power mode by default but switch to a high-power mode when they sense movement, and capture an image.
- The camera then performs AI inference on the edge, meaning it uses the chip inside to sort between various object classes such as 'animals', 'humans', and 'vehicles' in the image.
- If the AI deems it necessary, it autonomously transmits an image using the cellular system attached to the camera to an end-user in 30-40 seconds.

Source: The Hindu

Bacterial Cellulose

Why in the news?

Recently, researchers reported in a study that Bacterial cellulose can be used as a bandage to significantly improve healing and regeneration in plants.



About Bacterial Cellulose:

- It is a natural polymer produced by certain bacteria.
- It has been identified as an effective material for plant wound care. Its unique properties facilitate improved healing and regeneration in plants.

Advantages of Bacterial Cellulose bandages

- It offers a sustainable solution to plant injuries, potentially reducing the reliance on chemical treatments.
- This method not only promotes healthier plant growth but also aligns with eco-friendly agricultural practices.
- By enhancing the natural healing processes of plants, farmers can expect improved crop

yields and resilience, contributing to food security and environmental conservation.

Key facts about Cellulose:

- It is a molecule, consisting of hundreds of carbon, hydrogen and oxygen atoms.
- Cellulose is the main substance in the walls of plant cells, helping plants to remain stiff and upright.
- Humans cannot digest cellulose, but it is important in the diet as fiber.

Source: Indian Express

Vertical Propellant Mixer

Why in the news?

Recently, Indian Space Research Organisation has announced the successful development of a 10-tonne 'vertical planetary mixer', the largest of its kind for solid propellants globally.



About Vertical Propellant Mixer:

- It is the largest solid propellant mixing equipment globally.
- It is developed and designed by Satish Dhawan Space Centre in collaboration with Central Manufacturing Technology Institute, a Bengaluru-based research and development organisation under the Ministry of Heavy Industries.
- A propellant mixer is a machine that mixes the ingredients of rocket propellants, specifically fuel and oxidiser, to ensure a uniform and reliable mixture for solid rocket motors.
- The quality of the mixed propellant directly impacts the performance and reliability of the rocket motor.

Key Features of Vertical Propellant Mixer

- It has high-capacity mixing of propellant ingredients in a single batch.

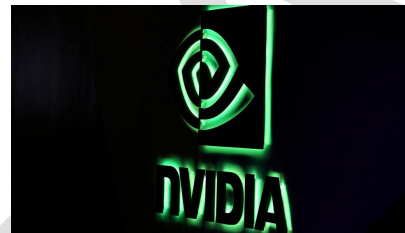
- It has precision and control for quality consistency & performance.
- Safety and Reliability for handling highly hazardous materials.
- World's Largest: It is of approximately 150 tonnes of weight.
- Advanced Technology: It is equipped with multiple agitators which are hydrostatic driven and will be remotely operated using PLC based control systems with SCADA stations.

Source: The Times of India

Evo 2 AI System

Why in the news?

AI chipmakers Nvidia have unveiled a powerful AI system for genetic research created a new AI called Evo 2.



About Evo 2 AI System:

- It is a powerful new foundation model that understands the genetic code for all domains of life.
- It is the largest publicly available AI model for genomic data.
- It was built on the NVIDIA DGX Cloud platform in a collaboration led by nonprofit biomedical research organization Arc Institute and Stanford University.
- The model was built using 2,000 Nvidia H100 processors on Amazon's cloud infrastructure.
- It is trained on an enormous dataset of nearly 9 trillion nucleotides pieces of genetic information taken from over 128,000 different organisms on a wide array of species across domains of life — including plants, animals and bacteria.
- In early tests, it accurately identified 90% of potentially harmful mutations in BRCA1, a gene linked to breast cancer.

Potential applications of Evo 2 AI System:

- It can be applied to biomolecular research applications including predicting the form and function of proteins based on their genetic sequence, identifying novel molecules for healthcare and industrial applications, and evaluating how gene mutations affect their function.

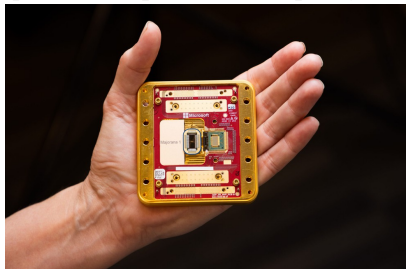
- The model can be applied to scientific fields such as healthcare, agricultural biotechnology and materials science.

Source: The Hindu

Majorana 1

Why in the news?

Microsoft released Majorana 1, the world's first quantum chip built on a topological core, recently.



About Majorana 1:

- It is the quantum computing chip developed by Microsoft.
- The Majorana 1 is designed to make quantum computing more practical, faster, and reliable.
 - Quantum computers process information differently from traditional computers, using quantum bits (qubits) instead of regular bits.

- Qubits can exist in states 0, 1, or both simultaneously (superposition).
- This allows them to solve complex problems much faster, but qubits are extremely fragile and prone to errors.

- Majorana 1 leverages a new material called a topoconductor or a topological superconductor, which helps create a special kind of qubit that is more stable and less prone to losing information.
- Majorana 1 relies on a subatomic particle called the Majorana fermion, which was theorised as existing by scientist Ettore Majorana in 1937.
- The Majorana 1 chip is made of a material made from indium arsenide and aluminum to create what Microsoft calls the “world’s first topoconductor.”
- This could finally allow quantum computers to scale up to millions of qubits and help solve real-world problems like designing better medicines, reducing pollution, and creating materials that can repair themselves.

Source: Hindustan Times

HEALTH

Rhodamine B

Why in the news?

A recent ban issued by the Food and Drug Administration (FDA) reinforces restrictions, prohibiting the use of Rhodamine B in any food-related applications due to increasing evidence of its carcinogenic properties.



About Rhodamine B:

- It is a water-soluble, fluorescent synthetic dye known for its bright pink hue.
- It appears green in powder form, turns vivid fluorescent pink when it comes in contact with water.

- It is commonly utilised in industries such as food, textiles, paper and leather.
- It has been banned in India by the Food Safety and Standards Authority of India (FSSAI). However, it is found in many food items sold by the street vendors due to its low cost. It is used as the colorant in chili powder or chili oil.
- Its application extends to scientific research due to its fluorescent properties.

Impacts on human health:

- Its use in consumable products is fraught with health risks.
- It can cause oxidative stress on cells and tissues if ingested.
- It can cause DNA damage, leading to mutations and potentially triggering cancerous growths.
- Animal research has demonstrated tumor development in organs like the liver and bladder following prolonged exposure to the dye.
- In sensitive individuals, it can lead to allergic reactions such as itching, redness and skin thickening.

- Long-term exposure to synthetic dyes like Rhodamine B can result in chronic allergic reactions and permanent skin pigmentation changes.

Source: The Hindu

Paraquat

Why in the news?

Recently, a 24-year old woman was awarded the death sentence by a Thiruvananthapuram court which found her guilty of poisoning her boyfriend in 2022 with a chemical herbicide called paraquat.



About Paraquat:

- Also known as paraquat dichloride or methyl viologen, it is one of the world's most-used herbicides.
- It is primarily used to control the growth of weeds and desiccate crops like cotton before harvest.
- The WHO classifies paraquat as Category 2 (moderately hazardous and moderately irritating) chemical.
- Its sale is banned in over 70 countries, including China and the European Union, due to its potent toxicity. It is widely used in the US and in India.

Mode of the transmission:

- Ingestion is the most common route of exposure.
- It may also be transferred and absorbed through prolonged skin contact.

Symptoms:

- It depends on the amount, means and length of exposure to the chemical.
- If ingested in a small amount, a person would display signs of damage to the heart, kidneys, liver and lungs over several days or weeks.
- If ingested in large amounts then the person could face acute kidney failure, rapid heart rate, failure of the heart and liver, seizures and respiratory failure.
- The person would immediately display abdominal pain, swelling and pain in the mouth and throat, bloody diarrhoea and nausea.

Treatments:

- There are no known antidotes for paraquat poisoning but some studies mentions that immunosuppression and Charcoal Hemoperfusion (CHP) can be used.
- CHP uses activated charcoal to remove toxins from the blood.

Source: Indian Express

Chronic Pulmonary Aspergillosis

Why in the news?

Recently, a new research paper has identified a life-threatening fungal infection called chronic pulmonary aspergillosis (CPA), mostly in the damaged lungs of tuberculosis survivors among Assam's tea plantation workers.

About Chronic Pulmonary Aspergillosis:

- It is an infection caused by *Aspergillus fumigatus*, a fungus that strikes individuals with immunodeficiency.
- It is a chronic lung disease that occurs commonly in pre-existing lung cavities.
- It mostly occurs in post-TB or active TB patients and shares similar clinical features with tuberculosis.
- It is not contagious, meaning it cannot be passed from person to person.

Symptoms of the disease:

- It doesn't always cause symptoms in the early stages. When symptoms do occur, they can vary from person to person. The most common symptom of CPA is coughing up blood.
- Other symptoms can include: unintentional weight loss, fatigue, shortness of breath, wheezing, etc.

Treatment of the disease:

- Antifungal medications are the most common treatment for CPA.
- Surgery is an option to remove the fungal mass.

About Aspergillus:

- Aspergillus species are filamentous fungi that are commonly found in soil, decaying vegetation, and seeds and grains, where they thrive as saprophytes.
- They are found in a wide variety of environments and substrates on the Earth throughout the year.
- Only a few well-known species are considered as important opportunistic pathogens in humans.

Source: Indian Express

Fentanyl

Why in the news?

Recently, the US President Donald Trump said his administration was discussing a 10% punitive duty on Chinese imports as fentanyl is being sent from China to the US via Mexico and Canada.



About Fentanyl:

- It is a potent synthetic opioid drug approved by the Food and Drug Administration for use as an analgesic (for pain relief) and anesthetic (for surgery).
- It is approximately 100 times more potent than morphine and 50 times more potent than heroin as an analgesic.
- Its overdoses can cause stupor, changes in pupil size, clammy skin, cyanosis (blue skin), coma and respiratory failure leading to death.

What are Opioids?

- These are a class of drugs that derive from, or mimic, natural substances found in the opium poppy plant.

- Some common opioids include oxycodone, morphine, codeine, heroin and fentanyl.
- An opioid overdose can be identified by a combination of three signs and symptoms: pinpoint pupils, unconsciousness and difficulties with breathing.
- Their overuse can lead to death due to the effects of opioids on the part of the brain which regulates breathing.

Impacts on human body:

- They activate an area of nerve cells in the brain and body called opioid receptors that block pain signals between the brain and the body.
- They produce a variety of effects, including pain relief and euphoria and are highly addictive.

Source: Indian Express

Organophosphate

Why in the news?

Recently, doctors treating patients from J&K's Baddal village said that organophosphate could be behind the 17 deaths that had spread panic in the village.



About Organophosphate:

- It is a chemical that is used in pesticides and insecticides, and absorbed through inhalation and ingestion.
- It is formed through the esterification process involving phosphoric acid and alcohol.
- It is generally used to protect crops from pests and even to control the spread of disease by insects and have extensive application in manufacturing plastics and solvents.

Impact on human Health:

- It disrupts the transmission of nerve signals in exposed organisms, which is fatal.
- Certain organophosphates have caused a different kind of neurotoxicity consisting of damage to the afferent fibers of peripheral and central nerves and associated with inhibition of "neuropathy target esterase".

What is Esterification?

- It is a chemical reaction in which alcohol and acid combine to create an ester as the main product.

Source: Indian Express

GARBH-INi-DRISHTI

Why in the news?

India's commitment to cutting-edge biomedical research and innovation took a significant leap forward with the dedication of the nation's first Ferret Research Facility, the launch of the GARBH-INi-DRISHTI data repository, and the execution of a key technology transfer agreement.



About GARBH-INi-DRISHTI:

- It is a data dashboard that provides a comprehensive overview of one of South Asia's largest pregnancy cohort datasets.
- This groundbreaking platform, developed under the GARBH-INi program, provides access to an unprecedented wealth of clinical data, images, and specimens collected from over 12,000 pregnant women, newborns, and postpartum mothers.
- It will empower researchers worldwide to conduct transformative research aimed at improving maternal and neonatal health outcomes.
- It serves as a gateway for researchers to explore the depth and diversity of the data, enabling a deeper understanding of the cohort.
- The platform also provides clear guidance on accessing the dataset for approved research purposes, fostering collaboration and impactful discoveries.

What is GARBH-INi program?

- It promotes Maternal and Child Health and develops prediction tools for preterm birth.
- It is an initiative under the Department of Biotechnology of the Union Ministry of Science and Technology as a collaborative interdisciplinary programme.
- This program is led by the Translational Health Science and Technology Institute (THSTI), NCR Biotech cluster, Faridabad.

- It is part of the Atal Jai Anusandhan Biotech Mission - Undertaking Nationally Relevant Technology Innovation (UNaTI).

Source: PIB

Rheumatoid Arthritis

Why in the news?

Recently, researchers have developed an innovative "self-actuating" drug delivery system that could revolutionize the treatment of rheumatoid arthritis (RA) by targeting inflammation directly within the joints so that therapeutic agents are released only when needed.

About Rheumatoid Arthritis:

- It is an autoimmune and inflammatory disease, wherein the immune system attacks healthy cells in the body by mistake, and causes inflammation in the affected parts of the body. The specific causes of RA are unknown.
- It mainly attacks the joints, usually many joints at once. RA commonly affects joints in the hands, wrists, and knees.
- Symptoms: In a joint with RA, the lining of the joint becomes inflamed, causing damage to joint tissue. This tissue damage can cause long-lasting or chronic pain, unsteadiness (lack of balance), and deformity (misshapeness).
- It can also affect other tissues throughout the body and cause problems in organs such as the lungs, heart, and eyes.
- Treatment: Its treatment usually includes the use of medications that slow disease and prevent joint deformity, called disease-modifying antirheumatic drugs (DMARDs).



Key points of the research:

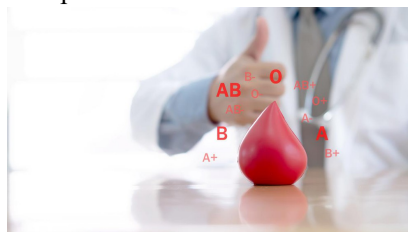
- Researchers have developed a smart system that responds directly to the biochemical signals in the inflamed synovial environment.
- The system uses specially designed microspheres loaded with methotrexate, a commonly used anti-rheumatic drug.
- The formulation consists of polymer-lipid hybrid micro-composites, where the lipid component (soya lecithin) ensures high drug encapsulation efficiency, and the polymer component (gelatin) provides responsiveness to Matrix metalloproteinases (MMP).

Source: PIB

Bombay Blood Group

Why in the news?

Recently, in a rare and complex medical procedure, a 30-year-old woman with the extremely rare 'Bombay' (hh) blood group underwent a successful kidney transplant in India.



About Bombay Blood Group:

- The Bombay, also known as HH, blood group is a rare blood group first discovered in Mumbai in 1952 by Y.M. Bhende.
- The Bombay blood group lacks A, B and H antigens, which are found in the common ABO blood groups.
- In normal individuals, the H antigen serves as the base structure for building A and B antigens. In Bombay blood group individuals, the gene responsible for producing the H antigen is mutated or absent, so neither A nor B antigens can be formed.
- Consequently, the people with Bombay Blood Group are incompatible with all standard blood types, including O-negative, complicating both transfusions and organ transplants.
- They can only receive blood from another Bombay blood group donor. Its prevalence is about 0.0004% (one in 4 million) of the total human population.
- While it drops to one in a million in the European population and one in 10,000 in Mumbai, the act of finding a donor is still daunting.

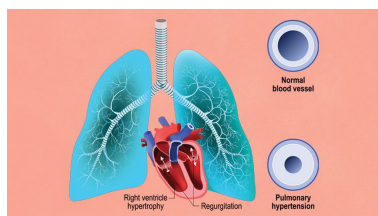
Source: The Hindu

Pulmonary Arterial Hypertension

Why in the news?

Recently, Natco Pharma has received U.S. Food and Drug Administration final approval for Bosentan tablets for oral suspension, its generic version of

Actelion Pharmaceuticals US Inc.'s pulmonary arterial hypertension



RACE IAS

(PAH) drug Tracleer.

About Pulmonary Arterial Hypertension:

- It is a specific type of pulmonary hypertension that is caused when the tiny arteries in your lung become thickened and narrowed.
- This blocks the blood flow through the lungs which raises the blood pressure in the lungs and causes the heart to work harder to pump blood through those narrowed arteries.
- Symptoms: Blue fingers or lips, Chest pain, Dizziness or fainting, Fatigue, Shortness of breath that gets worse over time etc.
- Treatment: While there are treatment options for PAH, there is no known cure.

Causes of the Pulmonary Arterial Hypertension:

- The exact cause of PAH is unknown but it is believed that PAH occurs when there is injury to the cells that line the blood vessels of the lung, which over time results in this blood vessel disease.
- It can also develop in association with other medical conditions including congenital heart disease, liver disease, HIV and connective tissue diseases — such as scleroderma and lupus.
- PAH can even be associated with past or present drug use, such as the use of methamphetamine or certain diet pills.

Source: The Hindu

Srjanam Rig

Why in the news?

Recently, the Union Minister launched India's first indigenous Automated Bio Medical Waste Treatment Plant Srjanam at AIIMS New Delhi.



About Srjanam Rig:

- It is an innovative, automated biomedical waste treatment rig, developed by CSIR-NIIST (National Institute for Interdisciplinary Science and Technology).

Features of Srjanam Rig:

- It can disinfect pathogenic biomedical waste such as blood, urine, sputum, and laboratory

disposables, without the use of costly and energy-intensive incinerators.

- The rig imparts a pleasant fragrance to the otherwise foul-smelling toxic waste.
- It has a daily capacity of 400 kg, the equipment is capable of handling 10 kg of degradable medical waste per day in the initial phase.

Advantages:

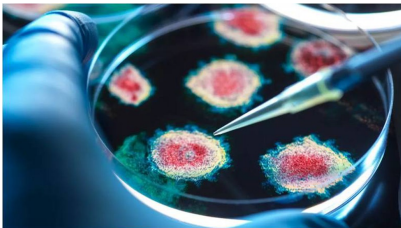
- It offers a safer and more efficient approach, eliminating the risks associated with human exposure to harmful waste and minimizing the chances of spills and accidents.
- The technology has been third-party validated for its antimicrobial action, and studies have shown that the treated material is safer than organic fertilizers like vermin-compost.
- It offers a significant advancement in the sustainable management of biomedical waste.
- It is an environmentally responsible alternative to traditional incineration methods.

Source: PIB

Sudan Virus Disease

Why in the news?

Recently, the Ugandan government and the World Health Organization confirmed an outbreak of Sudan virus disease.



About Sudan Virus Disease:

- It is a viral hemorrhagic fever disease, belonging to the same family as Ebola virus disease.

- It was first identified in southern Sudan in June 1976.
- It is caused by Sudan virus (SUDV). SUDV is enzootic and present in animal reservoirs in the region.
- It is a severe disease with high case fatality.
- Transmission: Person-to-person transmission occurs by direct contact with blood, other bodily fluids, organs, or contaminated surfaces and materials with risk beginning at the onset of clinical signs and increasing with disease severity.
- Treatment: There are no approved treatments or vaccines for Sudan virus, but early initiation of supportive treatment has been shown to significantly improve health conditions.

Symptoms of the Disease:

- It is typically characterized by acute onset of fever with non-specific symptoms/signs (e.g., abdominal pain, anorexia, fatigue, malaise, myalgia, sore throat) usually followed several days later by nausea, vomiting, diarrhoea, and occasionally a variable rash. Hiccups may occur.
- Severe illness may include hemorrhagic manifestations (e.g., bleeding from puncture sites, ecchymoses, petechiae, visceral effusions), encephalopathy, shock/hypotension, multi-organ failure

Source: Down to earth

Exercise Ekuverin

Why in the news?

Recently, the 13th edition of joint military exercise 'Ekuverin' between the Indian Army and the Maldives National Defence Force has commenced.



About Exercise Ekuverin:

- It is a bilateral annual military exercise, conducted alternatively in India and Maldives since 2009.
 - Ekuverin means 'Friends' in Dhivehi language.
- It is aimed at enhancing interoperability in counter insurgency and counter terrorism operations, and carry out joint humanitarian assistance and disaster relief operations.
- It is being conducted in Maldives this year. In 2023, it was conducted at Chaubatia in Uttarakhand.
- Both nations have very close and friendly relations in economic, cultural and military cooperation. 'Ex. Ekuverin' will assist in further bolstering these ties between the two nations.

Other exercise between India and Maldives:

- Exercise Ekatha is an annual exercise conducted between the navies of India and Maldives.

Source: The Times of India

TROPEX-25

Why in the news?

The 2025 edition of Indian Navy's capstone Theatre Level Operational Exercise (TROPEX), is currently underway in the Indian Ocean Region.



About TROPEX-25:

- It is an operational level exercise that is conducted biennially with participation by all operational Indian Naval units along with substantial participation of Indian Army, Indian Air Force and Coast Guard assets.
- TROPEX 25 is aimed at validating Indian Navy's core warfighting skills, and ensuring a synchronised, integrated response to preserve and protect national maritime security interests in a contested maritime environment against conventional, asymmetric as well as hybrid threats.
- The exercise is being conducted in various phases - both in Harbour and at Sea, integrating various facets of combat operations, cyber and electronic warfare operations, live weapon firings during Joint Work Up Phase and Amphibious Exercise (AMPHEX).
- During the exercise, the combined fleets comprising approximately 65 Indian Naval Ships, 09 Submarines and over 80 Aircrafts of different types, are put through complex maritime operational scenarios.
- It is witnessing participation of platforms like indigenous aircraft carrier Vikrant, state-of-the-art Visakhapatnam and Kolkata-class destroyers, Kalvari-class submarines and aircraft fleet comprising MiG 29K, P8I, HALE Sea Guardian and MH-60R helicopters.
- Towards enhancing synergy and jointness amongst the Services, IA, IAF and Indian Coast Guard have also been integrated into the exercise, with participation of Sukhoi-30, Jaguar, C-130, Flight Refueller, AWACS aircraft.
- TROPEX 25 is a step forward in coordinated planning, precise targeting, combat effectiveness and credible joint operations in a dynamic environment, towards safeguarding India's national maritime interests.

Source: PIB

Exercise Cyclone 2025

Why in the news?

India and Egypt will hold Exercise Cyclone 2025 from February 10 to 23 in Rajasthan.

About Exercise Cyclone 2025:



- It is a joint military exercise held between India and Egypt army.
- This is the third edition of Cyclone exercise. The first edition of the exercise was conducted in 2023 (In India) and second edition (In Egypt) was in 2024.
- Goal: The goal of the exercise is to improve coordination between the two armies. Training will include real-world scenarios and tactical drills.
- Motto of Exercise Cyclone 2025: "Together we train, together we excel"
- The exercise will involve the special forces of both countries. The Indian Army and the Egyptian Army would train together in desert conditions. The focus will be on counter-

terrorism, high-intensity combat, and survival techniques.

- Military cooperation between India and Egypt has strengthened in recent years. Both countries have emphasised the need to strengthen security efforts. The exercise will allow both forces to operate together in simulated combat situations.

Source: India Today

AWARENESS IN IT, COMPUTING, ROBOTICS & CYBER SECURITY

SANJAY Surveillance System

Why in the news?

Recently, the Minister of Defence flagged-off 'SANJAY - The Battlefield Surveillance System (BSS)' from South Block, New Delhi.



About SANJAY Surveillance System:

- It is a battlefield automated surveillance system which integrates the inputs from all ground and aerial battlefield sensors, processing them to confirm their veracity, preventing duplication and fusing them to produce a Common Surveillance Picture of the battlefield over secured Army Data Network & Satellite Communication Network.

Features of the SANJAY Surveillance System:

- It is equipped with state-of-the-art sensors and cutting-edge analytics.
- It will monitor the vast land borders, prevent intrusions, assess situations with unparalleled

accuracy and prove to be a force multiplier in Intelligence, Surveillance & Reconnaissance.

- It would enable commanders to operate in both conventional & sub-conventional operations in a Network Centric Environment.
- These systems will be inducted to all operational Brigades, Divisions & Corps of the Indian Army in three phases.
- Developed by: It has been indigenously & jointly developed by the Indian Army and Bharat Electronics Limited (BEL).

Significance of the SANJAY Surveillance System:

- Its induction will be an extraordinary leap towards data and network centricity in the Indian Army.
- It will enhance battlefield transparency and transform the future battlefield through a Centralised Web Application which will provide inputs to Command & Army Headquarters, and the Indian Army Decision Support System.

Source: PIB

Yashas

Why in the news?

Hindustan Aeronautics Limited (HAL) recently renamed its flagship HJT-36 jet training aircraft as 'Yashas', following significant upgrades.



About Yashas:

- It is the flagship jet training aircraft of the Hindustan Aeronautics Limited (HAL).
- The aircraft, previously known as Hindustan Jet Trainer (HJT)-36, has undergone extensive modifications aimed at improving its departure characteristics and spin resistance across the aircraft envelope, leading to its rechristening as 'Yashas.'
- It is fully equipped for Stage II pilot training, which includes a variety of specialized operations such as counter-insurgency, counter-surface force operations, and armament training.

Features of the aircraft:

- It has been upgraded with state-of-the-art avionics and a modern cockpit, enhancing both the training effectiveness and operational efficiency of the aircraft.

- The modifications also include a reduction in weight and the replacement of imported equipment with Indian-made Line Replaceable Units (LRUs), ensuring a more self-reliant and sustainable system.
- Its capabilities extend to aerobatics and armament carriage, supporting up to 1,000 kg of payload.
- It is powered by a Full Authority Digital Engine Control (FADEC)-controlled AL551 Jet engine, providing best-in-class thrust-to-weight ratio, optimised thrust management, and reliability.
- Additionally, the aircraft boasts a stepped-up rear cockpit with a drooped nose, providing improved all-around vision and enhanced situational awareness.

Source: The Hindu Business line

YOJANA / SCHEMES

National Manufacturing Mission

Why in the news?

Recently, the Union Minister for Finance announced the National Manufacturing Mission while presenting the Union Budget 2025-26 in Parliament.



About National Manufacturing Mission:

- It covers small, medium and large industries for furthering "Make in India".
- It will lay emphasis on five focal areas Ease and cost of doing business; future ready workforce for in-demand jobs; a vibrant and dynamic MSME sector; availability of technology; and quality products.
- Under this mission, the government will provide policy assistance, implementation roadmaps, and governance and monitoring structures for central ministries and states.

- It aims to enhance domestic value addition and build a robust ecosystem for solar PV cells, electric vehicle (EV) batteries, motors and controllers, electrolysis, wind turbines, high-voltage transmission equipment, and grid-scale batteries, supporting Clean Tech manufacturing.
- It will support design capacity, component manufacturing, and machinery required for production of non-leather quality footwear, besides the support for leather footwear and products.
- In addition to the mission, the credit guarantee cover is to be enhanced for MSMEs to Rs 10 crore from Rs 5 crore and investment and turnover limit for classification of all MSMEs will be enhanced to 2.5 and 2 times.

Source: PIB

Pradhan Mantri Dhan Dhanya Krishi Yojana

Why in the news?

The Finance Minister recently announced the Pradhan Mantri Dhan Dhanya Krishi Yojana, or the developing agri-districts programme, in her record 8th Union Budget presentation.



About Pradhan Mantri Dhan Dhanya Krishi Yojana:

- It is a new initiative aimed at supporting farmers in 100 regions facing challenges in agriculture.
- The scheme, in collaboration with the state government, aims to cover 100 districts in the country, and around 1.7 crore farmers will benefit from it.
- The scheme aims to generate opportunities in rural areas so that migration is an option and not a necessity.
- The scheme focuses on five key areas including:
 - Enhance agricultural productivity
 - Improve irrigation facilities
 - Improve credit availability
 - To adopt crop diversification and sustainable agriculture practices
 - To augment post-harvest storage at Panchayat and block levels.

Source: The Hindu

SwaRail Application

Why in the news?

Recently, the Ministry of Railways has introduced the SuperApp 'SwaRail', a one-stop solution for seamless railway services.

About SwaRail:

- It integrates various railway services, eliminating the need for multiple applications and reducing space consumption on user devices.
- A key focus of the App is enhancing user experience with a seamless and clean user interface (UI).
- The App caters to a wide range of user needs, including:
 - Reserved and Unreserved ticket bookings
 - Parcel and Freight Enquiries
 - Train and PNR status enquiries
 - Food Orders on Trains
 - Rail Madad for Complaint Management, etc.
- It has been developed by the Centre for Railway Information Systems (CRIS).

Centre for Railway Information Systems:

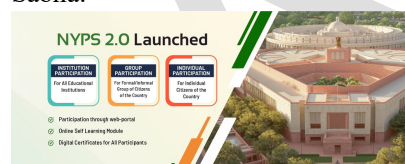
- It is an organization under the Ministry of Railways.
- It is a unique combination of competent IT professionals and experienced Railway personnel enabling it to successfully deliver complex Railway IT systems in core areas.
- It develops and maintains software for the key functional areas of the Indian Railways.

Source: PIB

National Youth Parliament Scheme (NYPS) 2.0

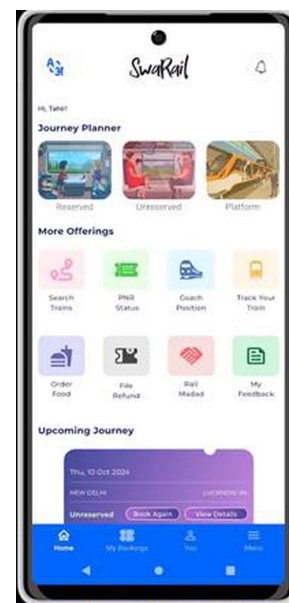
Why in the news?

Recently, the Minister of State in the Ministry of Parliamentary Affairs provided information about the National Youth Parliament Scheme 2.0 to the Rajya Sabha.



About National Youth Parliament Scheme (NYPS) 2.0:

- Its key objectives are to strengthen the roots of democracy, inculcate healthy habits of discipline, and tolerance of the views of others and to enable the student community to know about practices and procedures of the Parliament and to enhance their knowledge of the functioning of the Government, Constitutional values and for living their life in a democratic way.
- The web-portal of NYPS 2.0 enables all the citizens of the country to participate in the Youth Parliament programme through 3 different ways:
 - Institution Participation: All educational institutions can participate in this category by organizing the Youth Parliament sittings as per the guidelines available on the portal.
 - The students from classes VI to XII may be selected for the "Kishore



Sabha” sub-category and Undergraduate and Postgraduate level students may be selected for the “Tarun Sabha” sub-category.

- Group Participation: A group of citizens can participate in this category by organizing the Youth Parliament sittings as per the guidelines available on the portal.
- Individual Participation: An individual citizen can participate in this category by attempting a quiz on the theme of ‘Bhartiya Democracy in Action’.
- The e-training material viz. Literature on Youth Parliament, Model Debate, Model Questions, Model List of Business, Model Scripts, Video Tutorials, etc. are available as training resources on the web-portal of NYPS 2.0.

Source: PIB

GREAT Scheme

Why in the news?

Recently, the central government has approved 04 Start-Ups with a grant under the ‘Grant for Research & Entrepreneurship across Aspiring Innovators in Technical Textiles (GREAT)’ scheme.



About GREAT Scheme:

- It was launched in August 2023 with the aim to develop the Startup Ecosystem in Technical Textiles in India.
- It has evolved under the Research, Development, and Innovation Component of National Technical Textiles Mission (NTTM).
- It encourages young innovators, scientists/technologists, and startup ventures in the field of Technical Textiles to translate their ideas into commercial technologies/products and make India self-reliant.
- It supports individual entrepreneurs or start-ups for functional prototypes or commercialization of their technologies for Technical Textile.
- It supports innovations under application areas in all segments of Technical Textiles such as Agro-textiles, Building-textiles, Cloth-textiles, Geotextiles, Home-textiles, Industrial-textiles, Medical-textiles, Mobile-textiles, Oeko-textiles, Packaging-textiles, Protective-textiles, Sports-textiles, etc.

- Funding: A grant-in-aid of up to Rs 50 lakh for up to a period of 18 months will be provided.

Key facts about the National Technical Textiles Mission:

- It was launched to increase the penetration level of technical textiles in India while leveraging the extraordinary growth rate of the sector.
- The mission aims to position India as a global leader in Technical Textiles.

Components:

- Research, Innovation and Development
- Promotion and Market Development
- Export Promotion
- Education, Training, Skill Development
- Nodal Ministry: Ministry of Textiles

Source: PIB

Swavalambini Programme

Why in the news?

Recently, the union Ministry of Skill Development and Entrepreneurship launched the Swavalambini programme.

About Swavalambini Programme:

- It was launched by the Ministry of Skill Development and Entrepreneurship (MSDE) through Indian Institute of Entrepreneurship (IIE), in collaboration with NITI Aayog in Assam, Meghalaya and Mizoram.
- This initiative is aimed at empowering female students in select Higher Education Institutions (HEIs) in the northeast by equipping them with the essential entrepreneurial mind-set, resources, and mentorship they need to succeed in their entrepreneurial journey.
- Those who successfully build their ventures will be recognized and awarded, ensuring that their success stories inspire others. This initiative will define a clear process for how we nurture and scale women-led enterprises in India.
- The initiative aims to provide structured training through the Entrepreneurship Awareness Programme (EAP) which introduces 600 female students to entrepreneurship as a viable career option.



- For 300 selected students, the Women Entrepreneurship Development Programme (EDP) offers an intensive 40-hour training covering crucial business aspects such as training and skilling, access to finance, market linkages, compliance and legal support, business services, and networking opportunities.
- This will be followed by six months of mentorship and handholding support to help participants translate their ideas into sustainable prospects.

Source: PIB

Restructured National Bamboo Mission

Why in the news?

Recently, the Minister of State for Agriculture and Farmers Welfare informed the Lok Sabha about the restructured National Bamboo Mission.



About Restructured National Bamboo Mission:

- The restructured National Bamboo Mission was launched as a Centrally Sponsored Scheme in 2018-19.
- It provides assistance to both the Government & private sectors for the propagation and cultivation of bamboo in non-forest land, bamboo treatment, establishment of markets, incubation centers, value added product development & processing and development of tools & equipment.
- Funding Pattern: The funding pattern is 60:40 between Centre and State Government for all States except NE & Hilly States, where it is 90:10 and 100% in case of Union Territories/Bamboo Technology Support Groups (BTSGs) and National Level Agencies.

Major objectives:

- To increase the availability of quality planting materials, area expansion of bamboo cultivation.
- To improve post-harvest management, primary treatment and seasoning, preservation technologies, market infrastructure, product development,

promote skill development and re-align efforts to reduce dependency on import of bamboo and bamboo products.

- Implementation: It is being implemented through the state nodal department which is nominated by the State/UT governments concerned.

Source: PIB

MITRA Platform

Why in the news?

Recently, the Securities and Exchange Board of India introduced a new digital platform called MITRA.

About MITRA Platform:

- Mutual Fund Investment Tracing and Retrieval Assistant (MITRA) will assist investors in tracking and reclaiming inactive or unclaimed mutual fund folios.
- It is developed by the Registrar and Transfer Agent (RTAs) to provide investors with a searchable database of inactive and unclaimed mutual fund folios at an industry-level which will empower the investors.
- The criteria for classifying a folio as inactive include an absence of investor-initiated transactions, financial or non-financial, for a period of ten years, despite having a unit balance.
- SEBI has also revised the mandate of the Unit Holder Protection Committee (UHPC) under Mutual Funds rules.
- The UHPC will now be responsible for reviewing inactive folios along with unclaimed dividends and redemptions, ensuring proactive steps are taken to reduce such cases.



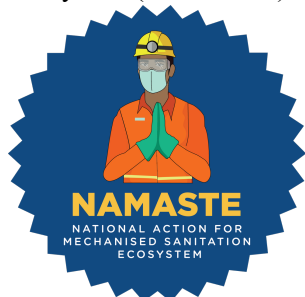
Features of the Platform:

- The platform addresses a growing concern wherein investors, over time, lose track of their mutual fund investments, lack of updated contact information, or unawareness of investments made in their name.
- It will allow investors to identify the overlooked investments or any investments made by any other person for which he/she may be rightful legal claimant and also encourage them to do KYC as per the current norms thus reducing the number of non-KYC compliant folios.

NAMASTE Scheme

Why in the news?

Recently, the union Minister for Social Justice and Empowerment (SJ&E) distributed Personal Protective Equipment (PPE) kits and Ayushman health cards to Sewer and Septic Tank Workers under the flagship scheme of National Action for Mechanized Sanitation Ecosystem (NAMASTE).



About NAMASTE Scheme:

- The objective of the “National Action for Mechanised Sanitation Ecosystem” (NAMASTE) scheme is to formalize and institutionalize the persons engaged in hazardous cleaning of sewers and septic tanks and promoting safe and mechanized cleaning through trained sanitation workers.
- It is jointly supervised by the Ministry of Social Justice and Empowerment (MoSJE) and the Ministry of Housing and Urban Affairs (MoHUA).
- Implementing agency: It is implemented by the National Safai Karmacharis Finance Development Corporation (NSKFDC) under the Ministry of Social Justice and Empowerment (MoSJE).
- Duration: It would be implemented for three years from FY 2023-24 to FY 2025-26.
- Target Groups: Sewer and septic tank sanitation workers (SSWs) and waste pickers in urban areas of India

What are the Aims of NAMASTE Scheme?

- Zero fatalities in sanitation work in India
- All sanitation work is performed by skilled workers
- No sanitation workers come in direct contact with human fecal matter
- Sanitation workers are collectivized into SHGs and are empowered to run sanitation enterprises
- All Sewer and Septic tank sanitation workers (SSWs) have access to alternative livelihoods

Source: PIB

NAKSHA Programme

Why in the news?

The Union Minister of Rural Development and Agriculture & Farmers' Welfare is inaugurating the NAKSHA Programme at Raisen, Madhya Pradesh.

About NAKSHA Programme:

- The National Geospatial Knowledge-based Land Survey of Urban Habitations (NAKSHA) programme aims to create and update land records in urban areas to ensure accurate and reliable documentation of land ownership.
- This initiative will empower citizens, improve ease of living, enhance urban planning, and reduce land-related disputes.
- This IT-based system for property record administration will foster transparency, efficiency and support sustainable development.
- The Survey of India is the technical partner for NAKSHA programme, which is responsible for conducting aerial surveys and providing orthorectified imagery, through third party vendors, to State and Union Territory governments.
- The end-to-end web-GIS platform will be developed by the Madhya Pradesh State Electronic Development Corporation (MPSEDC) and storage facilities will be provided by the National Informatics Centre Services Inc. (NICS).
- States and Union Territory governments are scheduled to conduct field surveys and ground truthing using the orthorectified imagery, ultimately leading to the final publication of urban and semi-urban land records.

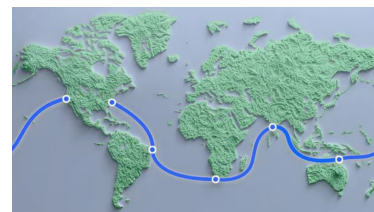


Source: PIB

Project Waterworth

Why in the news?

Recently, Meta announced its most ambitious subsea cable endeavour ever – Project Waterworth.



About Project Waterworth:

- It stretches over 50,000 km long cable which connects India, US, Brazil, South Africa and other “key regions”.
- Its cable will reach depths of up to 7,000 meters in deep waters.
- The project is using AI to enhance subsea cable infrastructure to improve global connectivity.
- It focuses on enhancing cable deployment and maintenance, ensuring reliable and efficient internet access worldwide.
- It uses enhanced burial techniques in high-risk fault areas, such as shallow waters near the coast, to avoid damage from ship anchors and other hazards.

What will Project Waterworth do?

- Project Waterworth, by leveraging advanced machine learning models, aims to predict and

mitigate potential disruptions, enhancing the resilience of subsea networks.

- The initiative will bring industry-leading connectivity to the US, India, Brazil, South Africa, and other key regions.
- This will facilitate greater economic cooperation, digital inclusion, and open opportunities for technological development in these regions.
- It would provide "industry-leading connectivity" to five major continents and help support its AI projects.

Source: Indian Express

MISCELLANEOUS

Enhanced Certificates of Origin 2.0 System

Why in the news?

Recently, the Directorate General of Foreign Trade (DGFT) has launched the enhanced Certificate of Origin (eCoO) 2.0 System.

About Enhanced Certificates of Origin 2.0 System:

- It is an upgrade designed to simplify the certification process for exporters and enhance trade efficiency.
- It offers several user-friendly features, such as multi-user access, which enables exporters to authorize multiple users under a single Importer Exporter Code (IEC).
- Additionally, the system now supports Aadhaar-based e-signing alongside digital signature tokens, providing greater flexibility.
- An integrated dashboard offers exporters seamless access to enhanced Certificate of Origin (eCoO) services, Free Trade Agreement (FTA) information, trade events, and other resources.
- The platform also introduces an in-lieu Certificate of Origin feature, allowing exporters to request corrections to previously issued certificates through an easy online application process.

- The platform processes over 7,000 eCoOs daily, including both preferential and non-preferential certificates, connecting 125 issuing agencies which includes 110 national and regional chambers of commerce & industry



- Certificates of Origin is a single access point for all exporters, for all FTAs/PTAs and for all agencies concerned.
- The electronic filing of Non-Preferential Certificates of Origin has become mandatory via the eCoO 2.0 platform, and is available to exporters at <https://trade.gov.in> under the “Get Certificate of Origin” section.
- The platform has been designed and developed by DGFT and Regional & Multilateral Trade Relations (RMTR) Division, Department of Commerce, Ministry of Commerce and Industry.

Source: PIB

Etikoppaka Toys

Why in the news?

Recently, Andhra Pradesh's eco-friendly wooden Etikoppaka Toys earned accolades at the Republic Day parade.



About Etikoppaka Toys:

- Known as Etikoppaka Bommalu, they are the exquisite wooden toys rooted in a 400-year-old tradition of craftsmanship.
- They originated in Etikoppaka village in Andhra
- The toys are renowned for their smooth contours and vibrant colours, coloured with natural dyes derived from seeds, lacquer, bark, roots and leaves.
- The artisans mainly use the wood from trees known as 'ankudu' (Wrightia tinctoria) that is soft in nature.
- These toys have no sharp edges. They are rounded on all sides.
- In 2017, the toys received the Geographical Indication (GI) tag, a hallmark of their authenticity and cultural significance.

Key facts about the GI tag:

- It is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin.
- In India, GI registration is administered by the Geographical Indications of Goods (Registration and Protection) Act, 1999.
- The first product in India to be accorded with GI tag was Darjeeling tea in the year 2004-05.

Source: Indian Express

Annual Status of Education Report (ASER) 2024

Why in the news?

After a prolonged decline due to learning losses during the COVID-19 pandemic, there has now been a modest recovery in foundational literacy and numeracy (FLN) among school students, according to the ASER 2024, released recently.

About Annual Status of Education Report (ASER):

- It is an annual citizen-led survey that provides reliable estimates of children's schooling and learning levels in rural India.
- It is published by the Pratham, an NGO, and the survey has been conducted every year since 2005.
- In 2016, ASER switched to an alternate-year model where the 'basic' ASER is conducted in all rural districts of the country every other year rather than annually.
- In the gap years, a smaller survey (typically 1-2 districts per state) focuses on other age groups and domains.
- The 'basic' ASER survey tracks enrollment for children aged 3-16 and assesses basic reading and arithmetic of children aged 5-16.
- ASER is a household-based rather than school-based survey.

- This design enables



bles all children to be included those who have never been to school or have dropped out; those who are in government schools, private schools, religious, or other types of schools; and those who are absent from school on the day of the assessment.

Highlights of ASER 2024:

- During the pandemic years, there was a big jump in government school enrolment, with the proportion of 6–14-year-old children enrolled in government schools rising from 65.6 percent in 2018 to 72.9 per cent in 2022. This number is back to 66.8 percent in 2024.
- Private school enrolment has been steadily rising since 2006 in rural India.
 - The proportion of 6-14-year-olds enrolled in private schools rose from 18.7 percent in 2006 to 30.8 percent in 2014 and stayed at that level in 2018.
- The report also noted that not only has there been a full recovery from the pandemic-induced

learning loss, the learning levels in the primary grades are higher than past levels in some cases.

- The percentage of Class 3 children who can perform at least subtraction at the basic arithmetic level was 33.7% in 2024, up from 25.9% in 2022 and higher than the pre-pandemic rate of 28.2% in 2018.
- While private schools saw a rise of about 4 percent, government schools saw a sharper 7 percent surge in this field.
- The percentage of Class 5 children who can now read a text at the Class 2 level was 44.8% in 2024, up from 38.5% in 2022 and nearly matching the 2018 rate of 44.2%.
- However, this percentage has not yet reached pre-pandemic levels at private schools; in 2024, it was 59.3%, up from 56.8% in 2022, but still less than 65.1% in 2018.
- More than 82 percent of children in the 14-16 age group know how to use a smartphone, but only 57 percent of them use it for educational purposes.
- The data in the report shows that both teacher and student attendance in government elementary schools has increased.
 - From 72.4% in 2018 to 73% in 2022 to 75.9% in 2024, the average student attendance rose.
 - Meanwhile, from 85.1% in 2018, the average teacher attendance rose to 86.8% in 2022 and 87.5% in 2024.
- In pre-primary schools for children aged 5, Karnataka, Gujarat, Maharashtra, Kerala, and Nagaland are among the states with enrollment rates above 90%.

Source: The Hindu

e-Shram Microsite and Occupational Shortage Index

Why in the news?

Recently, the Union Minister for Labour & Employment launched two significant initiatives – State and Union Territory Microsites under the e-Shram initiative and the Occupational Shortage Index (OSI).

About e-Shram Microsite:

- It is a transformative initiative aimed at ensuring that unorganised workers have seamless access to both State and Central government welfare programs.

Features of the initiative:

- These microsites are state-specific digital platforms seamlessly integrated with the national e-Shram database.
- It will facilitate two-way integration between State portals and the eShram portals and will facilitate simplified registration of unorganised workers.
- This will provide a one-stop solution for seamless access to both Central and State welfare programs for unorganised workers, employment opportunities, skilling programmes, etc.
- For States/UTs, the microsites provide a ready-to-use digital infrastructure, reducing the need for costly and time-consuming development processes. With real-time analytic dashboards, they facilitate better policy decision-making and allow States to include tools specific to their labour market requirements.
- It offers a seamless registration process and access to a wide range of social security benefits.
- The platform ensures multilingual accessibility, enabling workers from different regions to access information and services in their preferred language.
- Through two-way integration with the e-Shram database, workers receive real-time updates on welfare schemes and employment opportunities.
- Significance: It will enhance transparency and efficiency in welfare service delivery.



About Occupational Shortage Index (OSI):

- It provides data-driven insights into occupations facing shortages, helping align job seekers' skills with industry demands.
- It will support policymakers, training institutions, and businesses in bridging skill gaps in high-demand sectors.
- The index is designed to enable more effective decision-making in workforce planning and skill development initiatives, optimizing job matching and guiding State governments and employers in creating targeted skill development programs.

Source: PIB

Kashmir Hand-knotted Carpet

Why in the news?

Recently, the Geographical Indications Registry Chennai has granted a new logo for the Kashmir hand-knotted carpet in order to preserve the exclusivity of the famed Kashmir carpets.

About Kashmir Hand-knotted Carpet:

- The origin of hand knotted carpets, locally known as "Kal baffi" dates back to the 15th century after which it progressively attained the high degree of perfection.
- It is said that Sultan Zain-ul-Abidin brought carpet weavers from Persia and central Asia into Kashmir to train the local inhabitants.
- The loom used in Kashmir carpet weaving is composed of two horizontal wooden beams between which the wrap threads are stretched, one beam in front of the weaver and the second behind the first.
- The difference between a carpet and other hand woven rugs lies in the fact that short lengths of the thread or yarn are tied to wrap chains to form the pile of the carpet. These are commonly called knots though it is a loop rather than an actual knot.
- In Kashmir, the primary type of knot used in carpet weaving is called the "Farsi baff" or the "Sehna" knot, which is a Persian system of knotting.
- Very simple tools are used to thread these knots - a wood or a metal comb to push knots and weft tightly together and a pair of short scissors to cut the pile of the carpet to an even form once it is finished.

Other GI tagged Kashmir crafts:

- Apart from the hand-knotted carpet, six other crafts have already been GI registered, which include Papier Mache, Kashmir Pashmina, Kani, Sozni, Khatamband and Walnut Wood Carving.

Source: The New Indian Express

J. C. Bose Grant

Why in the news?

Recently, the Anusandhan National Research Foundation

(ANRF) has announced the launch of the new scheme J. C. Bose Grant (JBG).



About J. C. Bose Grant:

- It is a restructured form of the J. C. Bose Fellowship running under the erstwhile Science and Engineering Research Board (SERB).
- It recognizes the outstanding performance and contributions of senior Indian scientists and engineers to enhance their research in cutting-edge scientific and technological areas.
- It is designed to support senior-level researchers who have demonstrated exceptional achievements, with evidence of excellence such as publications records and research outcomes, patents, technology transfers, awards, and grants etc. across various domains of science and technology (S&T) including agriculture, medicine, as well as humanities and social sciences at the interfaces of S&T.
- Eligibility: Participants must be active, senior Indian scientists or researchers with a proven track record of excellence, holding at least a Professor-level position or equivalent at an Indian institution/university.
- Selection: The process of selection for J. C. Bose grants will be conducted once a year by a Search-cum-Selection Committee specially constituted for the purpose and as per the broad guidelines of the grant.



Grants:

- This grant provides an annual research funding of 25 lakhs for a duration of five years.
- Additionally, an annual overhead of Rs. 1.0 lakh will be provided to the implementing institution.
- If the Principal Investigator (PI) superannuates, during the term of the grants, it can be continued subject to the host institution's willingness to host the PI. The grant can be availed until the age of 68.

Key facts about the Anusandhan National Research Foundation:

- It is an apex body to provide high-level strategic direction of scientific research in the

country as per recommendations of the National Education Policy (NEP) aims to seed, grow and promote research and development (R&D) and foster a culture of research and innovation.

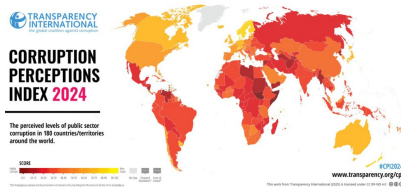
- It will support capacity building at all levels to strengthen the research ecosystem of the country.

Source: PIB

Corruption Perceptions Index

Why in the news?

According to the Transparency International report India ranked 96 out of 180 countries in the Corruption Perceptions Index (CPI) for 2024.



About Corruption Perceptions Index:

- It is the most widely used global corruption ranking in the world. It has been published annually by the non-governmental organisation Transparency International since 1995.
- It is an index which ranks countries "by their perceived levels of public sector corruption, as determined by expert assessments and opinion surveys."
- It generally defines corruption as an "abuse of entrusted power for private gain". It uses a scale of zero to 100, where "zero" is highly corrupt and "100" is very clean.
- It measures how corrupt each country's public sector is perceived to be, according to experts and business people.
- The score for each country is derived from a minimum of three data sources, selected from 13 distinct corruption surveys and assessments. These sources are gathered by a range of reputed organisations, such as the World Bank and the World Economic Forum.

Highlights of Corruption Perceptions Index (CPI) for 2024:

- The index, which lists countries by their perceived levels of public sector corruption, ranked Denmark at the top, followed by Finland, and Singapore.
- This year's Index highlighted the connection between climate action and corruption, linking it to the broader theme of climate financing.

- It gave India a CPI score of 38. In 2023, India's overall score was 39 while in 2022, it was 40. There is a decline in the score of India on CPI. In the Asia-Pacific region, the average score for the region has dropped by one point to 44 as the countries are still failing to deliver on anti-corruption pledges.
- Corruption not only undermines development in a country but is also a key cause of declining democracy, instability, and human rights violations as highlighted by the report.

Source: The Hindu

Prime Minister's Yoga Award

Why in the news?

Recently, the Ministry of Ayush announced the opening of nominations for the prestigious Prime Minister's Yoga Awards for the 2025 edition of the International Day of Yoga (IDY2025).



About Prime Minister's Yoga Award:

- It recognizes individuals and organizations that have made significant and sustained contributions to the promotion and development of Yoga, both nationally and internationally.
- It was established to honor the profound impact of Yoga on society and aim to celebrate exemplary contributions to the field, reinforcing Yoga's role in disease prevention, health promotion, and the management of lifestyle-related disorders.
- The awards will be conferred in the National Individual, National Organization, International Individual, and International Organization categories, with each winner receiving a Trophy, Certificate, and a Cash Award of Rs. 25 lakh.
- Eligibility: Individuals applying must be 40 years or older and should have at least 20 years of dedicated service in Yoga promotion.
- Entities can apply directly or be nominated by a prominent Yoga organization. Each applicant/nominee can apply for only one category (National or International) per year.
- Selection committee: A Screening Committee constituted by the Ministry of Ayush will review all applications and recommend a maximum of 50 names per award category to the Evaluation Jury.

- The Jury, comprising eminent personalities from various fields, will be the apex decision-making body

Source: PIB

PRACTICE QUESTIONS FOR MAINS EXAM

- Describe the effects of climate change in Uttar Pradesh and suggest possible solutions.
- "The Ganga River is not just a water source but also a cultural heritage." Write a brief comment on this statement.
- How successful has women's reservation been under the Panchayati Raj system in Uttar Pradesh? Has it truly led to grassroots empowerment? Discuss with examples.
- How has the 'Ek Parivar, Ek Rozgar' scheme, launched in Uttar Pradesh in 2024, impacted the state's unemployment rate? Assess its successes and challenges.
- "The folk arts of Uttar Pradesh are its cultural soul." Explain this statement.
- What new schemes have been implemented to promote tourism in Uttar Pradesh?
- What is the historical and cultural significance of Ayodhya?
- Which regions of Uttar Pradesh are developing as industrial hubs?
- What are the key economic reforms proposed in the recent budget of Uttar Pradesh?
- What efforts are being made to promote a startup culture in Uttar Pradesh?
- Internal security is not just the responsibility of the police and administration; citizens also play a crucial role. In the context of recent events in Uttar Pradesh, analyze the effectiveness of community-based security initiatives.
- Why is cultural diversity in Uttar Pradesh important for Indian society? Explain with examples.
- Analyze the successes and criticisms of the Police Commissionerate System in Uttar Pradesh. Should this model be implemented across the entire state?
- How effective have the special fast-track courts been in ensuring safety and justice for women in Uttar Pradesh? Have they been successful in delivering speedy justice?
- Which regions of present-day Uttar Pradesh were part of the ancient Mahajanapadas? Which Mahajanapada was the most politically and economically influential? Justify your answer.
- What steps have been taken by the government to strengthen the rural economy of Uttar Pradesh?
- Analyze the effects of increasing urbanization in Uttar Pradesh.
- Discuss the major reforms in the education policy of Uttar Pradesh.
- In 2024, the Uttar Pradesh government launched 'Operation Bhediya' to control the increasing wolf attacks in Bahraich district. Discuss the key objectives and outcomes of this operation.
- Discuss the major healthcare schemes implemented by the Uttar Pradesh government to strengthen the public health system. Analyze their objectives, challenges, and impact.