



TRANSFORM IAS

Transforming Lives with Education

CURRENT AFFAIRS MAGAZINE

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Current Affairs

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Sammed Shikharji on Parasnath hill

Why in News

Members of the Jain community have been protesting in many parts of the country against the Jharkhand government's decision of declaring the hill as a tourist place.

Important Points

- Hundreds of members of the Jain community have been taking out rallies and foot march in several cities including Mumbai, Ahmedabad, Delhi and Ranchi.
- Jains- a community that firmly follow non-violence and usually distance themselves from controversies have perhaps first time in decades came forward to hold protests.



What has upset Jains?

- Jharkhand government's decision to declare 'sacred' Shri Sammed Shikharji a tourist place and incidents of allegedly desecrating the sacred Shetrunjaya Hills in Gujarat's Bhavnagar district have triggered anger among lakhs of people belonging to the Jain community.

Sammed Shikharji

- Shikharji is one of the Holiest pilgrimage sites for Jains, in Giridih district, Jharkhand.
- It is located on Parasnath hill, the highest mountain in the state of Jharkhand.
- The reason that Sammed Shikharji is so important to the community, and why it does not want the place to turn into an eco-tourism spot, is because it is considered to be the biggest pilgrimage site by both the Digambaras and the Svetambaras.
- It is believed that it is the place where 20 of the 24 Jain tirthankaras, who are Jain spiritual leaders, along with many other monks attained 'moksha' or salvation after meditating.
- The word 'Shikharji' in itself means a 'venerable peak'. Interestingly, the word 'Parasnath' comes from 'Parshvanatha', the 23rd Jain tirthankara who attained moksha here.
- According to beliefs of the Jain community, Shikharji is ranked with Ashtapad, Girnar, Dilwara Temples of Mount Abu and Shatrunjaya as the 'Svetambara Pancha Tirth' or the five principal pilgrimage shrines.
- If someone wants to do a pilgrimage of Shikharji, they must start with Palganj on Giridih road, where there is a small shrine dedicated to Parshvanatha.
- Then, they can make some offerings to the temples of Madhuban located at the base of Parasnath hill.
- Pilgrims have to cover a long trek of about 27 km while doing a circumambulation of Shikharji.

Sari Festival "VIRAASAT"

Why in News

The second phase of the Sari Festival "VIRAASAT"- Celebrating 75 handwoven Saris of India has begun.

Important Points

About Sari Festival "VIRAASAT":

- The Ministry of Textiles has organised the festival..
- The second phase, having 90 participants from different parts of the country, brought enhanced attraction by participation of famous Handcrafted varieties of Saris like Tie and Dye, Chikan embroidered Saris, Hand Block Saris, Kalamkari printed Saris, Ajrakh, Kantha and Phulkari.
- The first phase of "VIRAASAT"- Celebrating 75 handwoven Saris of India started on 16th December 2022 and concluded on 30th December 2022.

- Coinciding with the 75 years of Independence, “Azadi ka Amrit Mahotsav” there will be an exhibition-cum-sale of Handloom Saris by 75 handloom weavers. A series of activities are planned to for the visiting public such as:
 - Viraasat - Celebrating the heritage: Curated display of handloom saris.
 - Viraasat-Ek Dharohar: Direct retail of saris by weavers
 - Viraasat Ke Dhage: Live loom demonstration
 - Viraasat–kal se kal tak : Workshops and talks on sari and sustainability
 - Viraasat–Nritya Sanskriti: Famous Folk dances of Indian culture
 - In the 1st Phase from 16th to 30th December 2022, 70 Participants took part in “VIRAASAT” event.



States	Prominent sari varieties
Andhra Pradesh	Uppada Jamdhani Sari, Venkatagiri Jamdani Cotton Sari, Kuppadam Sari, Chirala Silk Cotton Sari, Madhavaram Sari and Polavaram Sari
Kerala	Balaramapuram Sari and Kasavu Sari
Telangana	Pochampally Sari, Siddipet Gollabamma Sari and Narayanpet Sari
Tamilnadu	Kancheepuram Silk Sari, Arni Silk Saris, Thirubuvanam Silk Sari, Vilandai Cotton Sari, Madurai Sari, Paramakudi Cotton Sari, Aruppukottai Cotton Sari, Dindigul Cotton Sari, Coimbatore Cotton Sari, Salem Silk Sari and Coimbatore (Soft) Silk Saris & Kovai Kora Cotton Saris
Maharashtra	Paithani Sari, Karvath Kathi Sari and Nagpur Cotton Sari
Chhattisgarh	Tussar Silk Sari of Champa
Madhya Pradesh	Maheshwari Sari and Chanderi Sari
Gujarat	Patola Sari, Tangaliya Sari, Ashawali sari and Kuchchi Sari/ Bhujodi sari
Rajasthan	Kota Doria Sari
Uttar Pradesh	Lalitpuri Sari, Banaras Brocade, Jangla, Tanchoi, Cutwork, and Jamdani
Jammu & Kashmir	Pashmina Sari
Bihar	Bhagalpuri Silk Sari and Bawan Buti Sari
Odisha	Kotpad Sari and Gopalpur Tassar Sari
West Bengal	Jamdani, Santipuri and Tangail
Jharkhand	Tussar and Gichha Silk Sari
Karnataka	Ilkal Sari
Assam	Muga Silk Sari, Mekhla Chadar (Sari)
Punjab	Embd. & Croch (Phulkari)

Sagol Kangjei

Why in News

The Union Home Minister has inaugurated a 122-foot-tall statue of Sagol Kangjei, a polo player astride a Manipur Pony in Imphal.

Important Points

Sagol Kangjei

- Modern polo is said to have originated from Sagol Kangjei, a sport indigenous to Manipur, in which players ride horses, specifically the Manipur Ponies, which are referenced in records dating back to the 14th century.
- It was reproduced into a formal sports form by King Ningthou Kangba, of Ancient Manipur (Antique Kangleipak).
- The 'PUYAS' or ancient scriptures trace it to the mythological age when the game was played by gods.
- The game is played with 7 players on each side mounted on ponies, which are often not more than 4/5 feet in height.
- Each player is outfitted with a polo stick made of cane having a narrow angled wooden head fixed at the striking end. The ball, 14 inches in circumference is made of bamboo root.
- The mounted players hit the ball into the goal. Extremely vigorous and exhilarating the game is now played in two styles – the PANA or original Manipuri style and the International Style i.e. POLO.
- The fact that Manipur is the birthplace of polo is already supported by the Guinness World Records, by a declaration in the year 1991, as: “Polo can be traced to origins in Manipur state c. 3100 BC, when it was played as Sagol Kangjei.”
- The Marjing Polo Complex has been developed as a way to conserve the Manipur Pony.
- The state government’s Manipur Pony Conservation and Development Policy 2016 refers to the mythology around the Manipur Pony.

Manipur Pony

- The Manipur Pony is one of five recognised equine breeds of India, and has a powerful cultural significance for Manipuri society.
- The Manipuri pony has been indispensable with Manipuri society for its socio-cultural association for centuries. Its antecedents, however, are not clear, as one source stated Tibetan ponies as its ancestors while another source stated its origin to be a cross between Mongolian wild horse & Arabian.
- However, all agreed that it was derived from ancient stock. In some manuscripts, it is referred to as Mangal-sa or Mongolian animal.
- In Manipuri mythology, the Manipuri pony was regarded to have descended from “Samadon Ayangba” the winged steed of Lord Margjing, one of the guardian deities of Manipur.
- According to the Imphal-based curator and author, the Manipur Pony features in mythological stories, and is celebrated in oral tradition, ballads, and rituals. Historically an important part of Manipuri armies, it is used only for cavalry, rituals, and sport, not for working as a draught animal.
- The mythology is that it was created as a winged beast that had to be controlled because of which its wings had to be lopped off and it fell to the ground.
- It was created by Sanamahi, also known as Marjing, who is the older of two brothers in an archetypal sibling mythology. He feels that his birthright is stolen by his younger brother Pakhangba and creates the winged beast
- Samadon Ayangba to try to kill his brother.
- The horse turns out to be really destructive and begins to get out of control. Sanamahi’s father orders him to control it, as a result of which Sanamahi cuts off its wings.
- However, the small and dwindling numbers of the Manipur Pony has been a cause for concern.
- The 17th Quinquennial Livestock Census 2003 had recorded 1,898 Manipur Ponies; the number fell to 1,101 in the 19th Quinquennial Livestock Census in 2012.



Parshuram Kund Festival

Why in News

The Parshuram Kund Festival to be held in Arunachal Pradesh from 12th to 16th January 2023.

Important Points

- Parshuram Kund is a recognized location in Arunachal Pradesh and is tucked away in the lower levels of the Lohit River. The Kund, which lies 13 kilometers to the northeast of Tezu, is a well-known Hindu pilgrimage place that attracts a lot of followers.
- Devotees travel here especially on every Makar Sankranti from various areas of the world.
- It has mythological significance since it is connected to the Hindu sage Parasuram.
- On Makar Sankranti, a significant number of pilgrims go to the Kund to purify themselves of their sins.
- There is also a fair organized there at that time.
- Dedicated to sage Parshuram, the popular site attracts pilgrims from Nepal, from across India, and from nearby states of Manipur and Assam.
- Many devotees and sadhus take a holy dip in its water each year on the occasion of Makar Sankranti, in the month of January.
- The Kund is surrounded by dense forest of Ruddraksha trees, the fruit of which is considered sacred to Hindu ascetics as well as general believers of the faith.
- It is believed that Lord Parashuram the sixth incarnation of Lord Vishnu, on the orders of his father Rishi Jamadagni, beheaded his mother Renuka with his axe.
- Since he had committed one of the worst crimes of killing one's mother, the axe got stuck to his hand.
- His father pleased with his obedience decided to give him a boon to which he asked for his mother to be restored back to life.
- Even after his mother was brought back to life the axe could not be removed from his hand. This was a reminder of the heinous crime he had committed.
- He repented for his crime and on taking the advice of eminent rishis of that time, he arrived at the banks of Lohit River to wash his hands in its pure waters.
- It was a way to cleanse him of all the sins. As soon as he dipped his hands into the waters the axe immediately got detached and since then the site where he washed his hands became a place of worship and came to be known by sadhus as Parashuram Kund.
- Also there are many stories varying from region to region in India that describe the above incident .

About the Festival

- Parshuram Kund Mela is an annual religious fair which is celebrated near Parshuram Kund.
- During the festival pilgrims come to take a dip at the Kund, believed to wash away all sins during the festival.
- It is also known as the Kumbh of Northeast.
- Thousands of devotees visit the sacred shrine of Parshuram in Tezu every year.
- It comes under the PRASAD scheme of the central government.



World's longest river cruise with MV Ganga Vilas

Why in News

The Prime Minister of India will launch the world's longest river cruise, Ganga Vilas, on 13 January 2023 in Varanasi.

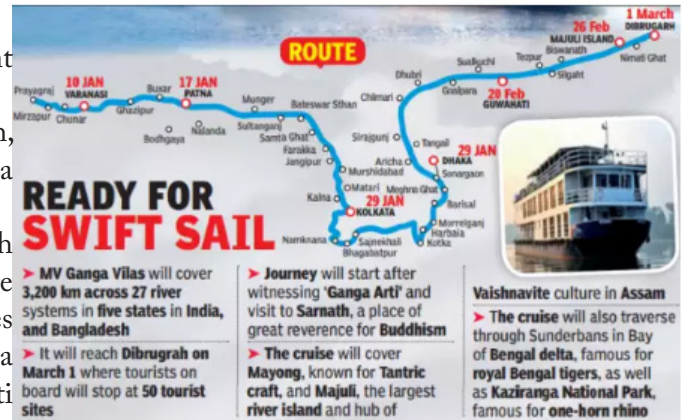
Important Points

- Prime Minister flagged off the world's longest river cruise, MV Ganga Vilas in Varanasi.
- MV Ganga Vilas will begin its journey from Varanasi, PM Modi's constituency, and sail around 3,200 km in 51 days to reach Dibrugarh in Assam via Bangladesh, traversing across 27 river systems in the two countries.
- This will expand trade and tourism and employment opportunities in eastern India.
- PM Modi also inaugurated a 'Tent City' on the banks of the Ganga river in Varanasi via video conferencing.

- The global River cruise market has grown at ~5% over the last few years and is expected to constitute ~37% of cruise market by 2027.
- Europe has been driving growth with approx. 60% share of river cruise vessels in the world. In India, 8 river cruise vessels are operational between Kolkata and Varanasi while cruise movement is also operation on National Waterways 2 (Brahmaputra).
- Tourism activities like river rafting, camping, sightseeing, kayaking and so on are operation in many spots in the country.
- The construction of 10 passengers terminals across NW2 are going on which will further bolster the prospect of river cruise.
- At present, four river cruise vessels are operational in NW2 while it is operating in limited capacity in NW3 (West Coast Canal), NW8, NW 4, NW 87, NW 97, and NW 5.

MV GANGA VILAS CRUISE

- The cruise, flagged off will make its route to Sant Ravidas Ghat from the Ramnagar port.
- The MV Ganga Vilas vessel is 62 meters in length, 12 meters in width and comfortably sails with a draft of 1.4 meters.
- The cruise will undertake a 51-day journey, with visits to 50 tourist spots, including World Heritage Sites, National Parks, river Ghats, and major cities like Patna in Bihar, Sahibganj in Jharkhand, Kolkata in West Bengal, Dhaka in Bangladesh and Guwahati in Assam.
- The cruise will have a capacity of 80 passengers with 18 suites.
- The Ganga Vilas Luxury Cruise will pass through Bangladesh and will go to Dibrugarh along the Brahmaputra river in Assam.
- On the 51-day journey, the cruise will pass through a total of five states in India and Bangladesh.
- A distance of more than 3,200 kms will be covered by the cruise.
- The cruise will pass through a total of 27 river systems of UP, Bihar, West Bengal, Bangladesh, and Assam. It will also cover three major rivers - Ganga, Meghna and Brahmaputra.
- The cruise will enter the Bhagirathi, Hooghly, Bidyavati, Malata, and Sundarbans river systems in Bengal.
- In Bangladesh, it will pass through Meghna, Padma, and Jamuna in Bangladesh and then enter the Brahmaputra in Assam.



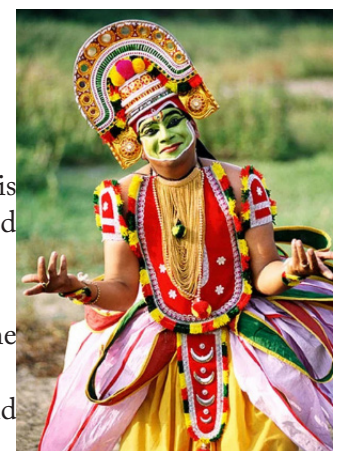
Ottanthullal dance

Why in News

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

Important Points

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



Corbusier contribution to Chandigarh

Why in News

The Supreme Court recently directed the Centre and the Chandigarh administration to take a number of steps to preserve Le Corbusier's Chandigarh.

Important Points

Le Corbusier's vision for Chandigarh

- Corbusier's Chandigarh wasn't built in a day. Conceived at the time of Partition, it came from a need to create a new city for Punjab that would hold the potent promise of creativity and potential.
- Its scale and site were decided at the national level, not at the local administrative level.
- In 1949, then Prime Minister Jawaharlal Nehru brought in American architect-planner Albert Mayer and Polish architect Matthew Nowicki to plan a modern city.
- Mayer and Nowicki envisioned superblocks with green spaces, while being sensitive to the natural gradient of the land and scope for drainage and water.
- However, after Nowicki's death in a plane crash in 1950, Swiss-French architect-planner Le Corbusier was commissioned for the project.
- While Corbusier stayed close to their early plans, he turned their curving road network into a rectangular grid, with straight lines that would privilege the automobile.
- However, he was keen on keeping to the "Garden City" idea, where high-rise buildings were unacceptable in commercial areas.
- He employed a grid street pattern, European-style boulevards and raw concrete buildings – a distillation of ideas formed across his lifetime.
- Corbusier's plan would have a heart and a head, where the "head" would contain the Capital Complex and the "heart" the commercial area.
- The "hands" would host recreational spaces and academic institutions. His rectangular grid encouraged self-sufficient units, dividing the city into different sectors.
- This urban idea of a city would fulfill four functions — living, working, movement and recreation, or "care for the body and spirit".
- It was an idea presented at the 1933 Athens Charter, formulated by Congress International d'Architecture Modern (CIAM), an organisation that spearheaded the Modern Movement in the world.

The Indians who contributed to the making of Chandigarh

- The then-chief engineer of Punjab, Mr PL Varma (Parmeshwari Lal Varma), is one of the most important figures in the history of the making of Chandigarh.
- He not only served as a direct associate to Le Corbusier during the making of Chandigarh's iconic structures but also was instrumental, along with Mr. P.N. Thapar, the chief administrator of the Chandigarh project, in the selection of the team appointed for this monumental task of creating a new capital under the patronage of the then prime minister Pt. Jawahar Lal Nehru.
- The team of engineers working with him on the designs of Le Corbusier went on to be instrumental in the making of the image of a post-Independence Indian architecture genre.
- One of such pioneers was Mr. Mahendra Raj Mehndiratta who was responsible for the structural design of Corbusier's Secretariat Building in the Capitol Complex.
- M.N. Sharma, the first Indian chief architect of Chandigarh, had worked directly under Corbusier and Jeanerette.



About Le Corbusier

- He was an influential architect and city planner whose designs combined functionalism with bold sculptural expressionism.
- He belonged to the first generation of the so-called International school of architecture, which promoted such characteristics as clean geometric forms and open efficient spaces.
- Le Corbusier was also a recognized writer and artist.
- Some of Le Corbusier's most well-known projects were the buildings Villa Savoye, Colline Notre Dame du Haut, and the Unité d'Habitation at Marseille, France; the unbuilt prototype for mass housing, Maison Dom-ino; the master plan for Chandigarh, India; and the book *Toward a New Architecture* (1923) wherein he famously declared "a house is a machine for living in."

161st birth anniversary of Swami Vivekananda

Why in News

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

Important Points

Swami Vivekananda

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

His teachings & philosophy

Vedantic Humanism

- Swami Vivekananda believed that there is only one Self in the universe. There is only one Existence. He saw the entire universe as a manifestation of the absolute One.
- On the coexistence of various faiths, he believed religious acceptance, and not tolerance was important.
- For Vivekananda, the most desirable path for self-realisation was the selfless service of man.
- He believed that some ways through which the essential unity of all human beings can be realised are unconditional love for all, judicious detachment, and expansion of self through service of fellow humans despite any sectarian difference.
- He was an exponent of vedantic humanism. He did not propagate a world-negating concept of spirituality, rather he said that each and every chore of your life should be done with divinity.
- He articulated that external rituals of religion are of secondary importance but the spiritual essence of a religion should be preserved and accepted.



Divinity within ourselves

- He said that infinite power is in the soul of man, whether he knows it or not. Its manifestation is only a question of being conscious of it. With the full consciousness of his infinite power and wisdom, the giant will rise to his feet.
- He asserted that each soul is potentially divine. The goal of human beings should be to manifest this divinity within, which can be done by controlling nature, external and internal.

Faith in oneself

- He emphasises that the ideal of faith in ourselves is of the greatest help to us as whatever "you think, that you will be. If you think yourselves weak, weak you will be; if you think yourselves strong, strong you will be."

- He said that one has to know that all knowledge, power, purity, and freedom are in oneself.
- He also urges people to not shy away from taking responsibility for their actions.

Four pathways of attaining moksha

- Swami Vivekananda spelt out the four pathways of attaining moksha from the worldly pleasure and attachment in his books — Raja-yoga, Karma-yoga, Jnana-yoga and Bhakti-yoga.
- **Karma-yoga**, or the yoga of selfless action tells that through the correct actions, the ‘troublemaker’ ego can turn into the ‘troubleshooter’ ego. It says that even if you do not believe in God, just focus on your work with utmost honesty, dedication and power of your mind. Be non-attached and keep working for work’s sake. Instead of worrying about the results, leave the fruits of your work to the Lord.
- **Bhakti-yoga** is the process of inner purification. Love is the vital element for all human beings, it teaches. Love is pure and cosmic, but ego pollutes it and gives out negative elements like lust, greed, jealousy and anger. God is the only one who truly loves us. Pour holy thoughts into the mind with prayer, chant holy words, study holy books and keep the holy company close to your heart.
- **Raja-yoga** seeks to attain the divine by igniting the flame of knowledge of the self within. Most seekers do not have the patience and perseverance to follow this path for the sacrifices that it calls for. Raja-yoga dispels that the mind is perverted to follow the path of reason. Teaching the process of meditation and concentration, it tells you to confront the restlessness of the mind and uproot it.
- **Jnana-yoga** is the path of knowledge. Weeding out the darkness of ignorance through the light of knowledge, it brings the ‘fire’ and ‘light’ alive by burning all the impurities of the mind. The mind does not give up its attachment to worldly pleasures unless it has tasted something greater and higher. Self-knowledge, according to jnana-yoga, is true liberation.

National Youth Festival

- The Ministry of Youth Affairs & Sports has been celebrating it with an objective of providing a platform to bring the youth of the country together in an attempt to provide them an opportunity to showcase their talents in various activities.
- The 26th National Youth Festival was held in Hubballi-Dharwad, Karnataka.

Harappan necropolis in Gujarat reveal death rituals

Why in News

Excavations at one of the biggest necropolises of the Harappan era at Juna Khatiya village in Gujarat have shown ancient humans buried the dead with afterlife items like personal artefacts, sacred animals, and pots of food and water.

Important Points

- The digging of this site in Kutch district began in 2019 and archaeologists found rows of graves with skeletal remains, ceramic pots, plates and vases, beaded jewellery, and animal bones that piqued their interest.
- Over time, it emerged as one the biggest Harappan burial sites, with the possibility of 500 graves, of which about 125 have been found so far.
- These are from 3,200 BCE to 2,600 BCE, predating Dholavira—a Unesco world heritage site—and several other Harappan sites in the state.
- The site is important because others like Dholavira have a cemetery in and around the town, but no major habitation has been discovered near Juna Khatiya.
- The site demonstrates the transition from earth-mound burials to stone graves.
- The pottery from the site have features and style similar to those excavated from early Harappan sites in Sindh and Balochistan.
- The artefacts can put the site in perspective of other pre-urban Harappan sites in Gujarat.
- The rectangular graves were made of shale and sandstone, which are common rocks in the area, and other than items like clay bowls and dishes, prized possessions like beads and bangles of terracotta, seashells, and lapis lazuli were interred with dead.

CONNECTING TO A LOST WORLD

Recent excavations in the Ghaggar basin sites of Bhirrana, Girawad, Farmana and Rakhigarhi have pushed the date for the beginning of the Harappan Civilization to 5500 BCE

The civilization's geographical extent spanned southeastern Afghanistan and Pakistan, NW and western states of India (Source: Shinde et al)

ANCIENT HARAPPAN CIVILIZATION SITE

Among the most enigmatic events in human history

In 1963, the Archaeological Survey of India discovered Rakhigarhi, a village in Haryana

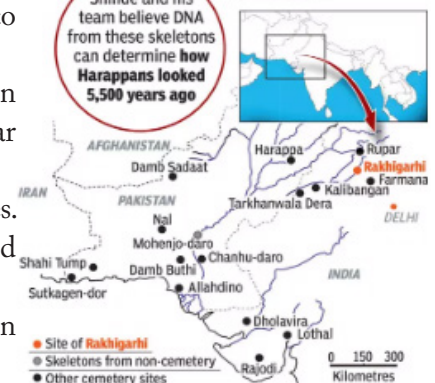
It was more ancient and much larger than the other Harappa and Mohenjo-daro sites

Vasant Shinde of Deccan College Deemed University, Pune is heading the Rakhigarhi excavation

In April 2015, four complete human skeletons were excavated at this site

These skeletons belonged to two male adults, a female adult and a child

Shinde and his team believe DNA from these skeletons can determine how Harappans looked 5,500 years ago



- The majority of burial pits had five to six pots. In one, 62 pots were found. They have not found any metal artefact from the site so far.
- Some of the burial structures have boulders of basalt as coverings. Pebbles of local rock, basalt, soil, sand, etc were used for construction, and clay was used to bind them together.

What is a necropolis?

- A necropolis is a large, designed cemetery with elaborate tomb monuments. The name stems from the Ancient Greek word which literally meaning “city of the dead”
- The term usually implies a separate burial site at a distance from a city, as opposed to tombs within cities, which were common in various places and periods of history.



Burial practices in the Indus Valley Civilization

- Across the Indus Valley, specific individuals, communities, and societies had their own normative methods of burial, suggesting religious and cultural diversity.
- There were three known types of burial customs within the Indus Valley Civilization;
 1. Complete burial of intact bodies.
 2. Full cremation, and
 3. Partial burials, containing only the bones of the deceased.
- Post cremation (burial of bones or ashes) was the most common form of burial custom in the Indus Valley.
- Even so, most cremation urns in Mohenjo-daro (Sindh, Pakistan) did not contain human bone remains, but rather ornaments that were possessed during life, animal bones, ash and charcoal.

1200-year-old miniature votive stupas discovered

Why in News

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

Important Points

About miniature votive stupas

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

About the Nalanda Mahavihara

- The Nalanda Mahavihara site comprises the archaeological remains of a monastic and scholastic institution dating from the 3rd century BCE to the 13th century CE.
- It includes stupas, shrines, viharas (residential and educational buildings) and important art works in stucco, stone and metal.
- Nalanda stands out as the most ancient university of the Indian subcontinent. It engaged in the organized transmission of knowledge over an uninterrupted period of 800 years.
- It presents a key archaeological evidence of a truly international centre for organised learning.
- Nalanda Mahavihara was founded by Kumargupta I of the Gupta dynasty in 5th century CE.
- It was patronized by various rulers including King Harshavardhana of Kannauj (7th century CE) and the Pala rulers (8th – 12th century CE) as well as various scholars.
- Later, number of factors spread over centuries caused the decline of this famed institution.
- The same region, later, saw emergence of a number of reputed educational institutions like Vikramshila and Odantpuri but the eminence of Nalanda remains unrivaled.
- About six centuries after Nalanda’s decline, the site was first discovered and reported by Sir Francis Buchanan.



- The site was systematically excavated and consolidated by Archaeological Survey of India from 1915 to 1937 and again from 1974 to 1982.
- Built ensembles in Nalanda are physical manifestation of influence of ancient Indian pedagogy where planning, architecture and artistic traditions of Indian sub-continent and beyond developed into subsequent architectural and artistic prototypes.
- Nalanda distinguished itself as the earliest planned university of the Indian subcontinent. Thematic and iconographic assimilation of features from major art-centres of the sub-continent with local practices is evident in art of Nalanda.
- While Nalanda stucco influenced practices in Thailand, its metal art influenced art of the Malayan archipelago, Nepal, Myanmar and Tibet travelling out through scholars.

Maghi Mela

Why in News

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

Important Points

Maghi Mela

- Maghi Mela has been celebrated in the city of Sri Muktsar Sahib in Punjab for centuries in memory of 40 Sikh warriors who were killed fighting the Mughals in the Battle of Khidrana in 1705.
- It was after this battle that Khidrana was named Muktsar, or the pool of liberation.
- The story of the Battle of Khidrana goes like this: in 1704, during the siege of Anandpur Sahib by the Mughals, 40 Sikh soldiers deserted their posts and fled.
- Upon arriving at their village near Amritsar, a woman named Mai Bhago scolded them and rallied the fighters to return to Anandpur Sahib in the service of their Guru.
- The freshly motivated soldiers along with Mai Bhago set off towards Anandpur Sahib to help Guru Gobind Singh hold fort against the Mughals.
- They met the Guru at Khidrana where they took on a large Mughal army, sacrificing their lives in the process.
- Interestingly, the actual martyrdom day of 40 Sikh soldiers (Muktas) falls in the month of Vaisakh, approximately in the first week of May – Gurdwaras continue to pay tributes to the martyrs in that month.
- About a century ago, however, due to the scarcity of water in the region, the mela started being organised on the Sankranti of Magh month. This tradition has continued, giving the festival its present name.
- People from different parts of the state and even outside come to Muktsar take a holy dip in the sarovar (lake) of Gurdwara Darbar Sahib and enjoy the festivities.
- Back in the day, people would arrive in the city days before the actual Maghi day. In the evenings, there would be kavi darbars (poetry sessions) where politicians would speak
- . This is likely how the political conferences, which can be traced back to the mid-1950s, started.
- Over time, the conferences were increasingly organised in the daytime, during the actual mela. Lengthy, overnight stays became less common due to changing lifestyles and priorities.



Chapter- 2

POLITY & GOVERNANCE

Supreme Court expands ambit of Article 19

Why in News

By ruling that a citizen can seek enforcement of the fundamental rights to freedom of speech not just against the state, the Supreme Court has, effectively, extended the ground for seeking these rights against other citizens.

Important Points

- It has ruled that a fundamental right under Article 19/21 can be enforced even against persons other than the State or its instrumentalities.
- The court took this view while ruling that the right of free speech and expression guaranteed under Article 19(1)(a) cannot be curbed by any additional grounds other than those already laid down in Article 19(2).
- One of the questions before the court was whether “a fundamental right under Article 19 or 21 of the Constitution of India be claimed other than against the ‘State’ or its instrumentalities?”
- Article 19 which guarantees freedom of speech and expression is a right invoked against the state.
- Some fundamental rights such as those prohibiting untouchability, trafficking and bonded labour are explicitly against both the state and other individuals.
- The court, extending free speech against private citizens, opens up a range of possibilities in Constitutional law.



What can be the possible impact of recent judgement?

- This interpretation could also bring an obligation on the state to ensure private entities also abide by Constitutional norms.
- These questions could hypothetically range from seeking enforcement of privacy rights against a private doctor to seeking the right to free speech against a private social media entity.
- The Court relied on the 2017 verdict in Puttaswamy where a nine-judge bench unanimously upheld privacy as a fundamental right.
- One of the key arguments by the government was that privacy is a right enforceable against other citizens and, therefore, cannot be elevated to the status of a fundamental right against the state.
- The Court also referred to several foreign jurisdictions, contrasting the American approach with the European Courts.
- Referring to the landmark New York Times vs. Sullivan, in which the US Supreme Court found that defamation law, as applied by the state against The New York Times, was inconsistent with the Constitutional guarantee of the freedom of speech and expression, the SC noted a shift in US law from a “purely vertical approach” to a “horizontal approach.”

What is the vertical and horizontal approach of rights?

- No jurisdiction in the world appears to be adopting, at least as on date, a purely vertical approach or a wholly horizontal approach.
- A vertical approach provides weightage to individual autonomy, choice and privacy, while the horizontal approach seeks to imbibe
- Constitutional values in all individuals. These approaches which appear to be bipolar opposites, raise the age-old question of ‘individual vs. society’.
- A vertical application of rights would mean it can be enforced only against the state while a horizontal approach would mean it is enforceable against other citizens.
- For example, a horizontal application of the right to life would enable a citizen to bring a case against a private entity for causing pollution, which would be a violation of the right to a clean environment.

Alderman

Why in News

Recently, Delhi's Lt. Governor, VK Saxena, nominated 10 aldermen amidst significant controversy.

Important Points

- The Aam Aadmi Party (AAP) accused the 10 aldermen nominated to the Municipal Corporation of Delhi (MCD) ahead of mayoral poll of being BJP workers and alleged that the civic body sent their names directly to the Delhi Lieutenant Governor VK Saxena without keeping the city government in the loop.
- The AAP attacked Delhi L-G alleging the illegal appointment of 10 aldermen in the MCD, terming the move unconstitutional.
- The party has alleged that while bypassing the elected Delhi government, the L-G unconstitutionally notified the names of the nominated councillors of MCD, also known as the aldermen.

What is an alderman?

- “Alderman” refers to a member of a city council or municipal body, with exact responsibilities depending on the location of its usage.
- Etymologically, the word comes from the combination Old English words for “old” (Anglian, ald or West Saxon, eald) and “man” (monn in Mercian/Anglian or mann in West Saxon).
- “Ald/eald” referred to “antique, of ancient origin, belonging to antiquity, primeval; long in existence or use; near the end of the normal span of life; elder, mature, experienced,” according to the Online Etymology Dictionary. The term “ald” itself is derived from “al” meaning “to grow, nourish.”
- The term for man has a more contested origin, with similar root words found in languages from Sanskrit (manuh) to Russian (muzh).
- “Aldormonn” (Mercian) or “ealdormann” (West Saxon) originally referred to elders of a clan or tribe, though soon it became a term for king’s viceroys, regardless of age.
- Soon, it denoted a more specific title – “chief magistrate of a county,” having both civic and military duties.
- As time passed, it became particularly associated with guilds with chiefs/leaders being referred to as aldormonn.
- In the 12th century CE, as guilds became increasingly associated with municipal governments, the term came to be used for officers of municipal bodies. This is the sense in which it is used till date.

Different locations, different meanings

- Today, an alderman has different roles in different places.
- Until the 19th century, there was no one role/definition of an alderman in Britain.
- Under the Municipal Reform Act 1835, municipal borough corporations consisted of councillors and aldermen. Aldermen would be elected not by the electorate, but by the council (including the outgoing aldermen), for a term of six years, which allowed a party that narrowly lost an election to retain control by choosing aldermen.
- The Local Government Act of 1972 finally abolished Aldermen with voting rights, with effect from 1974, except in the Greater London Council and the London borough councils, where they remained a possibility until 1978.
- In the US, depending upon the jurisdiction, an alderman could have been part of the legislative or judicial local government.
- A “board of aldermen” is the governing executive or legislative body of many cities and towns in the United States.
- Historically, in Canada, the term “alderman” was used for those persons elected to a municipal council to represent the wards.
- As women were increasingly elected to the municipal office, the term “councillor” slowly replaced “alderman”, although there was some use of the term “alderperson”. Today the term is rarely used.
- Australia and Ireland have also abolished the term and specific post of an alderman whereas, in South Africa, the term alderman refers to senior members of municipal councils.
- In the Netherlands, the term refers to members of the municipal executive (rather than the council).

Special Summary Revision (SSR) 2023 of ECI

Why in News

The Election Commission's annual exercise to revise the electoral roll concluded recently with the publication of the final electoral roll with January 1, 2023 as the qualifying date.

Important Points

- The Election Commission's annual exercise to revise the electoral roll concluded with the publication of the final electoral roll with January 1, 2023 as the qualifying date.
- Additions, deletions and changes to entries on the rolls were incorporated during the Special Summary Revision (SSR) 2023 that started in July last year.
- This revision was the first one since the government amended the election laws to allow four qualifying dates every year — January 1, April 1, July 1 and October 1.
- Those who turn 18 after January 1 were also asked to submit their registration forms during the SSR so they may be included in the rolls as and when they qualify.
- These new electors would be included during quarterly updation.
- As on now, the final electoral rolls were available on most state Chief Electoral Officers' websites for electors to search their names on.
- The Indian Express found the websites of 23 states and UTs had been updated with the final electoral roll: Andhra Pradesh, Arunachal Pradesh, Chhattisgarh, Haryana, Jharkhand, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Odisha, Punjab, Rajasthan, Sikkim, Tamil Nadu, Telangana, Tripura, West Bengal, Chandigarh, Delhi, and Puducherry.
- For these states and UTs, electors can visit the respective CEOs' website to either look for their names on the roll of their polling station, if they know it, or search with the name, age, date of birth and other details or Voter ID number.
- The websites of the CEOs of Bihar, Goa, Mizoram, Uttarakhand, and Dadra and Nagar Haveli and Daman & Diu still had the draft electoral rolls that were published in November 2022.
- Gujarat, Himachal Pradesh, and Jammu and Kashmir had been left out of the SSR 2023 as the EC had ordered revision of the electoral rolls earlier in 2022 in anticipation of elections.

Election Commission of India

- The Election Commission of India is an autonomous constitutional authority responsible for administering Union and State election processes in India.
- The body administers elections to the Lok Sabha, Rajya Sabha, State Legislative Assemblies in India, and the offices of the President and Vice President in the country.
- Part XV of the Indian constitution deals with elections, and establishes a commission for these matters.
- The Election Commission was established in accordance with the Constitution on 25th January 1950.
- Article 324 to 329 of the constitution deals with powers, function, tenure, eligibility, etc of the commission and the member.



18+? COME OUT & REGISTER YOURSELF AS A VOTER

WHY STAND IN LINE WHEN IT'S EASIER TO DO IT ONLINE

UGC norms for Foreign Universities

Why in News

The University Grants Commission (UGC) has announced draft norms for facilitating foreign universities and educational institutions to set up campuses in India.

Important Points

- The University Grants Commission (UGC) has announced draft norms for facilitating foreign universities and educational institutions to set up campuses in India which allow them autonomy in determining fees, as well as a 90-day approval process.
- The final norms will be notified by the end of the month after feedback from all stakeholders.
- A foreign university with a rank among the top 500 global rankings or a foreign educational institution of repute in home jurisdiction can apply to the UGC to set up a campus in India.

- The new National Education Policy [NEP], 2020 has envisioned that top universities in the world will be facilitated to operate in India.
- The application will be considered by a standing committee appointed by the UGC which will submit its recommendations within 45 days after examining the institution's credibility, programmes offered, their potential to strengthen educational opportunities in India, proposed academic infrastructure.
- Subsequently, within 45 days, the UGC may grant in-principle approval to the foreign institution to set up campuses in India within two years.
- The initial approval will be for 10 years, which can be extended.
- Governments in the past have made several attempts to enact legislation for the entry, operation and regulation of foreign universities in the country.
- The first was in 1995 when a Bill was introduced but could not go forward. In 2005-06, too, the draft law could only go up to the Cabinet stage.
- The last attempt was by UPA-II in 2010 in the shape of the Foreign Educational Institutions Bill, which failed to pass muster in Parliament and lapsed in 2014 since the BJP, Left and Samajwadi Party opposed it.
- One of the main reservations against foreign universities operating in India was that they would raise the cost of education (high tuition fees, faculty poaching from public universities), rendering it out of reach for a large part of the population.
- The latest UGC draft regulations try to address the latter by promising foreign universities complete autonomy in operating their Indian branch, including academic matters, governance, admission policy, tuition fee, faculty hiring, and remuneration.
- More significantly, repatriation of funds to the parent institution abroad, which was prohibited under the UPA-era Bill and had emerged as a major sticking point, has also been allowed.
- There's also no requirement for foreign education providers to maintain a corpus fund to operate in India. The UPA Bill insisted on an undertaking from universities to maintain a corpus fund of at least Rs 50 crore.

▶ WHAT DRAFT REGULATIONS SAY		
<ul style="list-style-type: none"> These varsities will have the freedom to decide on admission criteria and fee structure The commission has advised keeping the fees "reasonable and transparent" The foreign institution shall have the autonomy to recruit faculty/staff from India/abroad The varsity to ensure that the foreign faculty stay at the campus for a reasonable period 	<p>WHAT IT ENVISAGES</p> <p>The regulatory framework allowing the entry of higher-ranked foreign varsities will provide an international dimension to higher education, enable Indian students to obtain foreign qualifications at affordable cost, and make India an attractive global study destination</p>	<p>WHO ARE ELIGIBLE</p> <p>Two categories can apply. Universities that have secured a position within the top 500 of overall or subject-wise global ranking or a reputed institution in its home jurisdiction</p>
<p>FUNDS AND FUNDING</p> <ul style="list-style-type: none"> Cross-border movement of funds and maintenance of foreign currency accounts, mode of remittance, repatriation, and sale of proceeds shall be as per the Foreign Exchange Management Act (FEMA) The operation of foreign HEIs shall not be contrary to the sovereignty and integrity of India, the security of the state, friendly relations with foreign states, public order, decency, or morality An audit report shall be submitted annually to the commission certifying that the operations of the FHEIs in India are in compliance with the Act and related rules, the draft said 		

NCPCR guidelines on preliminary assessment

Why in News

NCPCR has come up with draft guidelines on the preliminary assessment of whether certain minors are to be tried under law as adults in particular cases.

Important Points

Preliminary assessment as per the JJ Act

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

About the guidelines

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



Section 6A of the Citizenship Act

Why in News

Constitution Bench take up Section 6A of Citizenship Act for preliminary determination

Important Points

- The Supreme Court Constitution Bench while hearing petitions challenging Section 6A of the Citizenship Act said that it will first decide whether the provision is constitutionally valid before proceeding to other issues raised in the pleas.

Section 6A of the Citizenship Act

- Section 6A deals with "special provisions as to the citizenship of persons covered by the Assam Accord".
- It says that all those who came to Assam on or after January 1, 1966, but before March 25, 1971, from the specified territory (it includes all territories of Bangladesh at the time of commencement of the Citizenship (Amendment) Act, 1985), and since then are residents of Assam, must register themselves under Section 18 for citizenship.
- The provision was introduced in 1985 following the signing of the Assam accord between the Government of India and agitating groups in the state.
- Assam is the only state in India to have an exclusive cut-off date for citizenship. For the rest of the country, the cut-off date is July 19, 1949.
- Though Section 6A of the Act differentiates between those who came till January 1, 1966 and those till March 24, 1971, the updated NRC does not. The NRC authorities accepted any one of the listed documents under list A and from list B till March 24, 1971.
- The NRC was updated as per the Rule 4A of the Citizenship (Registration of Citizens and Issue of National Identity Cards) Rules, 2003.
- Section 3 of the Act principally states that those who were born on or after January 26, 1950 in India but before July 1, 1987 would be an Indian citizen.

About the National Register of Citizens (NRC)

- NRC is the register containing names of Indian citizens .
- The only time that a National Register of Citizens (NRC) was prepared was in 1951 when after conduct of the Census of 1951, the NRC was prepared by recording particulars of all the persons enumerated during that Census.
- It is mandated by the 2003 amendment of the Citizenship Act, 1955. Its purpose is to document all the legal citizens of India so that the illegal immigrants can be identified and deported.
- It has been implemented for the state of Assam starting in 2013–2014.
- The Government of India announced plans to implement it for the rest of the country in 2021, but it has not yet been implemented.

Three new Multi-state cooperative bodies formed

Why in News

The Union Cabinet has recently approved setting up of three new multi-state cooperative bodies.

Important Points

Multi-state cooperative bodies

Three new multi-state cooperative bodies under the Multi-State Cooperative Societies (MSCS) Act, 2002 are:

- o National multi-state cooperative export society
- o National multi-state cooperative organic society and
- o National multi-state cooperative seed society

Multi-state cooperative organic society

- It will manage various activities related to the organic sector by providing certified and authentic organic products.
- It will help in unlocking demand and consumption potential of organic products in domestic as well as global markets.
- It will also help cooperatives and ultimately their farmer members in getting benefits of high price of organic products through aggregation, branding and marketing on a large scale by facilitating testing and certification at affordable cost.



CABINET DECISIONS
11 JANUARY 2023

Multi-State Cooperative Organic Society

Cabinet approves setting up of a national level multi-state cooperative society for organic products

Benefits:

- Help in unlocking demand and consumption of organic products in domestic and global markets
- Help cooperatives and farmer members in getting high price of organic products through aggregation, branding & marketing
- Provide institutional support for aggregation, certification, storage, processing & more
- Manage entire supply chain of organic products



CABINET DECISION
11 JANUARY 2023

Multi-State Cooperative Export Society

Cabinet approves setting up of national level Multi-state cooperative export society

- To be registered under **Multi State Cooperative Societies (MSCS) Act, 2002**
- Will act as an umbrella organization for export of surplus goods/services.
- Primary to national level cooperatives societies including primary societies, district, state and national level federations and multi state cooperative societies can become its Member.
- All these cooperatives will have their elected representatives in the **Board of society** as per its bye-laws.

Multi-state seed cooperative society

- It will act as an apex organisation for production, procurement, processing, branding, labelling, packaging, storage, marketing and distribution of quality seeds; strategic research and development; and to develop a system for preservation and promotion of indigenous natural seeds; through various cooperative societies across the country with support from relevant ministries.

- It will help to increase the seed replacement rate, varietal replacement rate, ensuring the role of farmers in quality seed cultivation and seed variety trials.

Multi-state cooperative export society

- It will provide thrust to exports from the cooperative sector by acting as an umbrella organisation for carrying out and promoting exports.
- It will also help cooperatives in getting benefits from various export-related schemes and policies of different ministries of the central government in a focused manner.
- Basically, it will help unlock the export potential of Indian cooperatives in the global market.

Kollam declared India's first Constitution literate district

Why in News

Kollam in Kerala has been declared as the first Constitution literate district in the country.

Important Points

- This feat was achieved through The Citizen, a Constitution literacy campaign jointly launched by the Kollam district panchayat, District Planning Committee and Kerala Institute of Local Administration (KILA).
- This ambitious campaign aimed to educate people (above the age of 10) in the district on the Constitution, and the impact it has on their daily lives.
- The campaign was a remarkable success in educating citizens, who were unaware of the Constitution, on their rights and the importance of the document.
- It is an ongoing effort to ensure that all citizens are aware of the Constitution and their rights as citizens.
- As part of the campaign, the entire population of Kollam above the age of 10 were briefed on the preamble of the Constitution and the historical background of the document, its basic principles, fundamental rights of citizens, and legal remedies. Everyone, including government institutions, private establishments, socio-cultural organisations, and educational institutions.
- Around 20 to 25 individuals from each municipality and 10 to 15 persons from each grama panchayat were selected for training and they are called senators. The Kollam Corporation will have 100 to 150 senators.



What is Constitution literacy?

- It means knowledge and education on and about the Constitution and the laws set in place for citizens of a nation.

Euthanasia and a living will

Why in News

Recently, a five-judge Bench of the Supreme Court agreed to significantly ease the procedure for passive euthanasia in the country by altering the existing guidelines for 'living wills', as laid down in its 2018 judgment in Common Cause vs. Union of India & Anr case.

Important Points

What is euthanasia?

- Euthanasia refers to the practice of an individual deliberately ending their life, oftentimes to get relief from an incurable condition, or intolerable pain and suffering. Euthanasia, which can be administered only by a physician.
- Different countries have different euthanasia laws.
- Euthanasia is categorized in different ways, which include voluntary, non-voluntary, or involuntary.
- Voluntary euthanasia is when a person wills to have their life ended and is legal in a growing number of countries.
- Non-voluntary euthanasia occurs when a patient's consent is unavailable and is legal in some countries under certain limited conditions, in both active and passive forms.
- Involuntary euthanasia, which is done without asking for consent or against the patient's will, is illegal in all countries and is usually considered murder.

What is 'living wills'?

- A living will—also known as an advance directive—is a legal document that specifies the type of medical care that an individual does or does not want in the event they are unable to communicate their wishes.



Practice of Euthanasia in India & across the world

- The Supreme Court allowed passive euthanasia while recognising the living wills of terminally-ill patients who could go into a permanent vegetative state, and issued guidelines regulating this procedure.
- A five-judge Constitution Bench headed by then Chief Justice of India (CJI) Dipak Misra said that the guidelines would be in force until Parliament passed legislation on this.
- However, this has not happened, and the absence of a law on this subject has rendered the 2018 judgment the last conclusive set of directions on euthanasia.
- As of 2006 euthanasia had become the most active area of research in bioethics.
- In some countries divisive public controversy occurs over the moral, ethical, and legal issues associated with euthanasia.
- Netherlands, Luxembourg, Belgium allow both euthanasia and assisted suicide for anyone who faces “unbearable suffering” that has no chance of improvement.
- Switzerland bans euthanasia but allows assisted dying in the presence of a doctor or physician.
- Canada had announced that euthanasia and assisted dying would be allowed for mentally ill patients by March 2023; however, the decision has been widely criticised, and the move may be delayed.
- United States has different laws in different states. Euthanasia is allowed in some states like Washington, Oregon, and Montana.
- United Kingdom considers it illegal and equivalent to manslaughter.

What changes after the SC's order this week?

- The petition was filed by a nonprofit association submitted that the 2018 guidelines on living wills were “unworkable”. Though the detailed judgement is yet to be released, the Court dictated a part of their order in open court.
- As per 2018 guidelines, a living will was required to be signed by an executor (the individual seeking euthanasia) in the presence of two attesting witnesses, preferably independent, and to be further countersigned by a Judicial Magistrate of First Class (JMFC).
- Also, the treating physician was required to constitute a board comprising three expert medical practitioners from specific but varied fields of medicine, with at least 20 years of experience, who would decide whether to carry out the living will or not.
- If the medical board granted permission, the will had to be forwarded to the District Collector for his approval.
- The Collector was to then form another medical board of three expert doctors, including the Chief District Medical Officer.
- Only if this second board agreed with the hospital board's findings would the decision be forwarded to the JMFC, who would then visit the patient and examine whether to accord approval.
- This cumbersome process will now become easier.
- Instead of the hospital and Collector forming the two medical boards, both boards will now be formed by the hospital.
- The requirement of 20 years of experience for the doctors has been relaxed to five years. The requirement for the Magistrate's approval has been replaced by an intimation to the Magistrate.
- The medical board must communicate its decision within 48 hours; the earlier guidelines specified no time limit.
- The 2018 guidelines required two witnesses and a signature by the Magistrate; now a notary or gazetted officer can sign the living will in the presence of two witnesses instead of the Magistrate's countersign.
- In case the medical boards set up by the hospital refuses permission, it will now be open to the kin to approach the High Court which will form a fresh medical team.

Law on lawyers advertising their work in India

Why in News

Recently, the Supreme Court lawyers have condemned a ‘legal powerlist’ published by Forbes India. Bar Council of India Rules prohibit lawyers from advertising themselves, but that’s not the case in other countries.

Important Points

- In India, lawyers and legal practitioners are not allowed to advertise their work.
- Section 49(1)(c) of the Advocates Act, 1961 empowers the Bar Council of India (BCI) to make rules with respect to “the standard of professional conduct and etiquette to be observed by advocates”.
- Rule 36 in Chapter II (“Standards of Professional Conduct and Etiquette”) of Part VI (“Rules Governing Advocates”) of the BCI Rules published in 1975 prohibits lawyers from advertising their work.
- The Rule reads: “An advocate shall not solicit work or advertise, either directly or indirectly, whether by circulars, advertisements, touts, personal communications, interviews not warranted by personal relations, furnishing or inspiring newspaper comments or producing his photographs to be published in connection with cases in which he has been engaged or concerned.”
- Rule 36 also requires that an advocate’s signboard or nameplate “should be of a reasonable size”.
- It further states that the signboard/ nameplate or stationery should not indicate that he is or has been President or Member of a Bar Council or of any Association or that he has been associated with any person or organisation or with any particular cause or matter or that he specialises in any particular type of work or that he has been a Judge or an Advocate General.
- An advocate who violates this rule can face punishment for professional or other misconduct under Section 35 of the Advocates Act.
- This section empowers the State Bar Council to refer the case to a disciplinary committee that can, after giving the advocate an opportunity to be heard, suspend him for some time, remove his name from the state’s roll of advocates, or reprimand him — or dismiss the complaint altogether.

What is the basis for having such a rule?

- In a 1975 ruling, Justice Krishna Iyer of the Supreme Court in ‘Bar Council of Maharashtra vs. M V Dabholkar’ provided the rationale for this: “Law is no trade, briefs no merchandise, and so the leaven of commercial competition or procurement should not vulgarise the legal profession.”
- In 1995, in ‘Indian Council Of Legal Aid & Advice vs Bar Council Of India & Anr’, the SC said that the functions of the Bar Council include the laying down of standards of professional conduct and etiquette which advocates must follow to maintain the dignity and purity of the profession.
- Law, the SC said, was a “noble profession”, and those engaged in it have certain obligations in society as the practice of law has a “public utility flavour”.



Changes in 2008

- Following a challenge in the SC to the constitutional validity of Rule 36 in ‘VB Joshi vs Union of India’, the restrictions were somewhat relaxed.
- In 2008, Rule 36 was amended, and advocates were allowed to provide their names, contact details, post qualification experience, enrollment number, specialisation, and areas of practice on their websites.
- A provision to Rule 36 inserted in 2008 said the rule “will not stand in the way of advocates furnishing website information as prescribed in the Schedule under intimation to and as approved by the Bar Council of India”.
- With the proliferation of web portals and apps offering legal services on the Internet, legal practitioners have been finding indirect and more subtle ways to advertise themselves while staying within the confines of Rule 36.
- Many of them post about their work on LinkedIn, organise and speak at webinars and seminars, write columns for newspapers, and appear on TV programmes and debates.

What is the situation in other countries?

- Lawyers can legally advertise their services in the United States, the United Kingdom, Australia, and the European Union.
- UK: Rule 7 of the Solicitors Code of Conduct 2007, allows lawyers in the UK and Wales to advertise their practice, business or firm as long as it's not done in a "misleading" or "false" way. Rule 7 reads: "You are generally free to publicize your firm or practice, subject to the requirements of this rule."
- US: The American Bar Association's Model Rules of Professional Conduct (MRPC) issued in 1908 prohibited advertising for lawyers. Ordinance 27 reiterated the prohibition by construing "soliciting" as unprofessional. However, after the US Supreme Court's landmark 1977 decision in 'Bates vs Arizona', lawyers can advertise their services. Bar associations of states are free to make laws in this regard
- EU: Section 2.6 of the Council of Bars and Law Societies of the Europe Code of 2006 discusses the aspect of "Personal Publicity". Section 2.6.1 allows a lawyer to inform the public about his services as long as the information is accurate and not misleading, respectful of confidentiality obligations and other core values of the legal profession.

Rural Health Statistics 2021-2022

Why in News

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

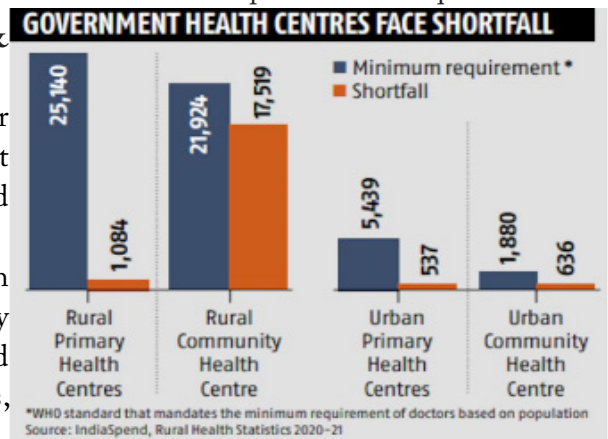
Important Points

- It provides data on health infrastructure including manpower up to 31st March of every year.
- In order to identify the deficiencies in the present healthcare infrastructure and human resources in rural, urban, and tribal sections of the nation, it would function as a vision document.
- As per this report, India's rural healthcare system continues to be plagued by shortfall on two critical fronts — doctors and infrastructure.
- There is a shortage of 83.2 percent of surgeons, 74.2 percent of obstetricians and gynaecologists, 79.1 percent of physicians and 81.6 percent of paediatricians.
- Less than half the Primary Health Centres (PHC) function on a 24×7 basis. Of the 5,480 functioning Community Health Centres (CHC), only 541 have all four specialists.
- In the Indian healthcare system, sub-centres (SC) are the first point of contact for a patient, catering to a population of 3,000-5,000. This is succeeded by a PHC, which is required to look after the daily needs of 20,000-30,000 people.
- CHCs provide referrals and access to specialists, catering to 80,000-120,000 people. These facilities are overburdened across the board, with SCs currently looking after more than 5,000 people, PHCs catering to 36,049 people and CHCs to 164,027 people. This, coupled with a human resource shortage, plagues access to adequate and quality healthcare.
- SCs, PHCs and CHCs had more staff in 2021, at the height of the deadly second wave of COVID-19, as compared to now.
- The number of auxiliary nurse midwives at SCs has decreased in 2022. The shortage was most pronounced in Uttar Pradesh, Gujarat, Himachal Pradesh, Odisha and Uttarakhand.
- The number of doctors at PHCs has shrunk to 30,640 in 2022 from 31,716 in 2021.
- Lab technicians, nursing staff and radiographers at PHCs and CHCs have all recorded a marginal increase between 2021 and 2022.
- Uttar Pradesh, Rajasthan, Madhya Pradesh, Gujarat and Odisha face the highest shortage in surgeons, obstetricians / gynaecologists, paediatricians and radiographers at CHCs across the country.
- Urban PHCs, part of the National Health Mission's efforts to set up multi-tier health centres catering to a population of 50,000-75,000, also face severe shortages. These facilities currently face a shortage of 18.8 percent of doctors, 16.8 percent of pharmacists, 16.8 percent of lab technicians and 19.1 percent of staff nurses.
- Urban CHCs encounter a shortfall of 46.9 percent of total specialists, 14.7 percent of General Duty Medical Officers, 49.3 percent of radiographers, 3.9 percent of pharmacists, 7.2 per cent of lab technicians and 5.3 per cent of staff nurses.

- While there has been a decline in the past year, a huge improvement has been recorded as compared to 2005, when the government launched the National Rural Health Mission.
- The allopathic doctors at PHCs have increased in 2022, about 50.9% increase. There is a shortfall of 3.1% of allopathic doctors at PHC, out of the total requirement at all India level.
- The number of specialist doctors at Community Health Centers (CHCs) have also increased in 2022.
- Moreover, compared to the requirement for existing infrastructure, there is a shortfall of 83.2 percent of surgeons, 74.2 percent of obstetricians and gynaecologists, 79.1 percent of physicians and 81.6 percent of paediatricians.
- Overall, there is a shortfall of 79.5 percent of specialists at the CHCs as compared to the requirement.

Health Management Information System (HMIS) 2020-21 & 2021-22 report

- The report offers a detailed analysis of the major performance indicators for patient care, adolescent health, immunisation, family planning coverage, and maternal and child health.
- The compendium includes selected research studies on maternal health, child health, family planning, non-communicable diseases (NCDs), and communicable diseases (CDs), among other topics, done by PRCs in the years 2021–2022.



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Chapter- 3

ENVIRONMENT AND ECOLOGY

Dwarf Boa

Why in News

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

Important Points

- The snake from the Tropidophiidae family was found in the cloud forest in northeastern Ecuador and was up to 20 centimetres long.
- Tropidophis cacuangoae can be identified from other reptiles in the same genus based on its external features and bone structure.
- The scientists found two verified specimens of the species.
- Its colouring is primarily light brown with darker brown or black blotches — similar to a boa constrictor.
- The species inhabits eastern tropical piedmont and lower evergreen montane forests in the Amazon tropical rainforest biome and the researchers suspect it to be an Ecuadorian endemic.
- Both specimens were found within 50 kilometres of each other — Colonso Chalupas national reserve and in the private Sumak Kawsay park.
- The species is unusual for having a “vestigial pelvis”, which is characteristic of primitive snakes. This could be evidence that snakes descended from lizards that lost their limbs over millions of years.
- The snake’s name honours Dolores Cacuango, an early 20th-century pioneer in the fight for indigenous and farmers’ rights in Ecuador.
- The researchers also talk about the relationships of the new species with South American tropidophiids and provide the key to the identification of mainland South American dwarf boas.
- Their morphological evidence provides support against the recognition of the posterior extension of the maxilla suborbital ramus, the posterior extent of maxillary teeth rows and dentary teeth count as synapomorphic characters of Tropidophiidae.
- The discovery of T cacuangoae demonstrates that small and cryptic vertebrates can undergo large periods of time without being detected.



Airglow can make sky colourful

Why in News

Even though the night sky is dark, due to airglow it illuminates with a mixture of red, yellow, and green colours.

Important Points

- The sky isn’t actually blue ,it just appears that way.
- The sky, after all, is just transparent air, “a stage upon where all colors dance.”
- On a clear sunny day the sky as blue.
- There are many misconceptions and incorrect answers bandied about — because it reflects the ocean; because oxygen is a blue-colored gas; because sunlight has a blue tint — while the right answer is often thoroughly overlooked.

What is airglow?

- Airglow occurs when atoms and molecules in the upper atmosphere, excited by sunlight, emit light to shed their excess energy. Or, it can happen when atoms and molecules that have been ionized by sunlight collide with and capture a free electron.
- In both cases, they eject a particle of light — called a photon — in order to relax again.

- The phenomenon is similar to auroras, but where auroras are driven by high-energy particles originating from the solar wind, airglow is energized by ordinary, day-to-day solar radiation.
- This phenomenon originates with self-illuminated gases and has no relationship with Earth's magnetism or sunspot activity.
- The Sun produces a broad spectrum of visible light, which we see as white but it includes all the colours of the rainbow.
- When sunlight passes through the air, atoms and molecules in the atmosphere scatter blue light in all directions, far more than red light.
- This is called Rayleigh scattering, and results in a white Sun and blue skies on clear days.
- At sunset we can see this effect dialled up, because sunlight has to pass through more air to reach us.
- When the Sun is close to the horizon, almost all the blue light is scattered (or absorbed by dust), so we end up with a red Sun with bluer colours surrounding it.
- If you look at the night sky, it is obviously dark, but it isn't perfectly black. Yes, there are the stars, but the night sky itself glows. This isn't light pollution, but the atmosphere glowing naturally.
- On a dark moonless night in the countryside, away from city lights, you can see the trees and hills silhouetted against the sky.
- This glow, called airglow, is produced by atoms and molecules in the atmosphere.
- In visible light, oxygen produces green and red light, hydroxyl (OH) molecules produce red light, and sodium produces a sickly yellow.
- Nitrogen, while far more abundant in the air than sodium, does not contribute much to airglow.
- The distinct colours of airglow are the result of atoms and molecules releasing particular amounts of energy (quanta) in the form of light.
- For example, at high altitudes ultraviolet light can split oxygen molecules (O₂) into pairs of oxygen atoms, and when these atoms later recombine into oxygen molecules they produce a distinct green light.
- Sodium atoms make up a minuscule fraction of our atmosphere, but they make up a big part of airglow, and have a very unusual origin – shooting stars.
- One can see shooting stars on any clear dark night. They are teeny tiny meteors, produced by grains of dust heating up and vaporising in the upper atmosphere as they travel at over 11 kilometres per second.
- As shooting stars blaze across the sky, at roughly 100 kilometres altitude, they leave behind a trail of atoms and molecules.
- Sometimes one can see shooting stars with distinct colours, resulting from the atoms and molecules they contain.
- Very bright shooting stars can even leave visible smoke trails. And among those atoms and molecules is a smattering of sodium.
- Airglow or nightglow is a type of chemiluminescence that makes the atmosphere glow.
- Light is produced when atoms and molecules in air absorb radiation and release photons.
- The most common color of airglow is green, but red and blue also occur.

Airglow Color and Causes

- The most common airglow colors are green, red, and blue.
- However, other colors also occur. The colors are characteristic of photochemical reactions occurring at different levels of the atmosphere.
- Most of the effect comes from oxygen in air



Airglow on Other Planets

- Earth isn't the only world with airglow. The Venus Express spacecraft detected near-IR light from the upper atmosphere of Venus. The light comes from the interaction between radiation and molecular oxygen and nitric oxide (NO).
- Ultraviolet emissions were also detected.
- NASA's Mars Atmosphere and Volatile Evolution (MAVEN) probe photographed nightglow on Mars.
- The glow is in the ultraviolet region of the spectrum and caused by nitric oxide emission.

Protein found in Zebrafish can regenerate aged discs in human vertebrae

Why in News

Pune scientists have found that a protein in zebrafish which helps in disc maintenance and promotes regeneration in aged discs between vertebrae can have potential therapeutic implications for degenerated human discs

Important Points

- The protein plays a positive role in disc maintenance and promotes regeneration in aged discs between vertebrae can have potential therapeutic implications to promote regeneration in degenerated human discs.
- In humans, discs degenerate naturally, leading to many related health concerns, including low back, neck, and appendage pain.
- Currently, only symptomatic treatments for disc degeneration are available, including pain relievers or anti-inflammatories. In severe cases, disc replacement or disc fusion surgery is performed.
- Thus, there is an urgent need to develop a treatment either to suppress disc degeneration or to promote disc regeneration in humans.
- Medical examinations have given insights into the stages of degenerating human discs, but limited information is available about the cellular and molecular processes playing a role in the maintenance of the discs.
- Most importantly, no medical procedures or treatments have been known to suppress disc degeneration or induce disc regeneration.
- A study by Agharkar Research Institute (ARI), Pune, an autonomous institute of the Department of Science and Technology, discovered that a protein called Cellular communication network factor 2a (Ccn2a) secreted from intervertebral disc cells induces disc regeneration in aged degenerated discs by promoting cell proliferation and cell survival by modulating the pathway called the FGFR1-SHH (Fibroblast growth factor receptor-Sonic Hedgehog) pathway.
- The study which used Zebrafish as a model organism is the first in vivo study showing that it is possible to induce disc regeneration in a degenerated disc by activating an endogenous signaling cascade.
- The scientists also found that the Ccn2a-FGFR1-SHH signaling cascade takes a positive role in disc maintenance and augmenting disc regeneration.
- The study used genetic and biochemical approaches and is likely to help design a novel strategy to suppress disc degeneration or induce disc regeneration in degenerated human discs.

Ozone hole

Why in News

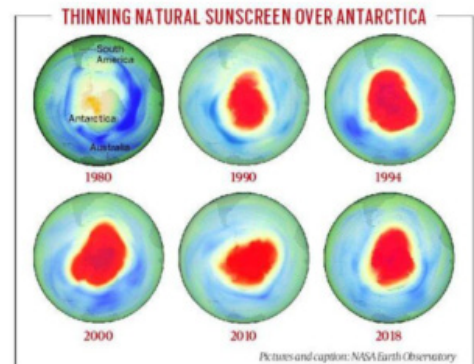
A scientific assessment has suggested that the ozone 'hole', once considered to be the gravest danger to planetary life, is now expected to be completely repaired by 2066.

Important Points

- The depletion of the ozone layer, first noticed in the early 1980s, used to be the biggest environmental threat before climate change came along.
- Ozone (chemically, a molecule having three Oxygen atoms, or O₃) is found mainly in the upper atmosphere, an area called stratosphere, between 10 and 50 km from the Earth's surface.
- It is critical for planetary life, since it absorbs ultraviolet rays coming from the Sun. UV rays are known to cause skin cancer and many other diseases and deformities in plants and animals.
- Though the problem is commonly referred to as the emergence of a 'hole' in the ozone layer, it is actually just a reduction in concentration of the ozone molecules. Even in the normal state, ozone is present in extremely low concentrations in the stratosphere. Where the 'layer' is supposed to be the thickest, there are no more than a few molecules of ozone for every million air molecules.
- In the 1980s, scientists began to notice a sharp drop in the concentration of ozone. This drop was much more pronounced over the South Pole, which was later linked to the unique meteorological conditions — temperature, pressure, wind speed and direction — that prevail over Antarctica. The ozone hole over Antarctica is the biggest during the months of September, October, and November.
- By the middle of 1980s, scientists had figured out that the chief cause of ozone depletion was the use of a class of industrial chemicals that contained chlorine, bromine or fluorine.
- The most common of these were the chlorofluorocarbons, or CFCs, that were used extensively in the airconditioning, refrigeration, paints, and furniture industries.

Improvement in the situation

- The ozone hole has been steadily improving since 2000, thanks to the effective implementation of the Montreal Protocol.
- The latest scientific assessment has said that if current policies continued to be implemented, the ozone layer was expected to recover to 1980 values by 2066 over Antarctica, by 2045 over the Arctic, and by 2040 for the rest of the world.
- The recovery of the ozone layer has been made possible by the successful elimination of some harmful industrial chemicals, together referred to as Ozone Depleting Substances or ODSs, through the implementation of the 1989 Montreal Protocol.
- The assessment has reported that nearly 99 per cent of the substances banned by the Montreal Protocol have now been eliminated from use, resulting in a slow but definite recovery of the ozone layer.
- In fact, it is only the ozone layer over Antarctica — where the hole is the most prominent — which will take a long time to heal completely. Over the rest of the world, the ozone layer is expected to be back to where it was in 1980 by 2040 itself.
- The elimination of ozone-depleting substances has an important climate change co-benefit as well.
- These substances also happen to be powerful greenhouse gases, several of them hundreds or even thousands of times more dangerous than carbon dioxide, the most abundant greenhouse gas and the main driver of global warming.
- The report said that global compliance to the Montreal Protocol would ensure the avoidance of 0.5 to 1 degree Celsius of warming by 2050.
- This means that if the use of CFCs and other similar chemicals had continued to grow the way it did before they were banned, the world would have been 0.5 to 1 degree Celsius warmer than it already is.
- In fact, it was with this climate change objective in mind that the Montreal Protocol was amended in 2016 to extend its mandate over hydrofluorocarbons, or HFCs, that have replaced the CFCs in industrial use.
- HFCs do not cause much damage to the ozone layer — the reason they were not originally banned — but are very powerful greenhouse gases.
- The Kigali Amendment to the Montreal Protocol seeks to eliminate 80-90 per cent of the HFCs currently in use by the year 2050.
- The success of the Montreal Protocol in repairing the ozone hole is often offered as a model for climate action. It is argued that emissions of greenhouse gases can also similarly be curtailed to arrest rapidly rising global temperatures.
- However, the parallels of elimination of ODSs with greenhouse gases are limited. The use of ODSs, though extensive, was restricted to some specific industries. Their replacements were readily available, even if at a slightly higher cost initially.
- The impact of banning these ozone-depleting chemicals was therefore limited to these specific sectors. With some incentives, these sectors have recovered from the initial disruption and are thriving again.



Cold wave

Why in News

Delhi and other parts of northwest India have been reeling under a cold wave spell.

Important Points

- In Delhi, the Safdarjung weather station, which provides representative figures for the city, has recorded cold wave conditions for five consecutive days so far this month, making it the longest such spell in a decade.
- The lowest minimum temperature recorded this month was 1.9 degrees Celsius and the second-lowest minimum temperature in January in 15 years.
- While lower-than-normal temperatures were recorded over parts of Northwest India, these conditions intensified in the first week of January.
- Fog and low cloud coverage brought severe cold day conditions to the region, when temperatures remained below normal over parts of Delhi, Punjab, Haryana, Chandigarh, Himachal Pradesh, Rajasthan, Uttar Pradesh and Madhya Pradesh.

About cold wave

- A cold wave is a weather phenomenon that is distinguished by a cooling of the air.
- The India Meteorological Department (IMD) marks a cold wave in terms of minimum temperatures – when the minimum temperature in the plains is 4 degrees or less or when the minimum temperature is less than 10 degrees and 4.5 to 6.4 degrees below the normal.
- One of the major factors contributing to colder than normal temperatures over north India this month is the large-scale fog cover.
- While westerly and northwesterly winds of around 5 to 10 kmph in the afternoon have also been contributing to the dip in temperature, an important factor this month is fog, which has been lasting for longer durations, preventing sunlight from reaching the surface and affecting the radiation balance.
- Light winds and high moisture near the land surface have been contributing to the formation of a blanket of fog over large swathes of the Indo-Gangetic plains in the morning.
- Since there has not been any significant impact of western disturbances over the region, cold northwesterly winds have also been contributing to low temperatures.
- Western disturbances, which are storms from the Mediterranean region, are associated with a change in wind direction, bringing easterly winds to northwest India.
- Delhi usually records cold wave spells in December and January. Over the past decade, the number of cold wave days in January has ranged from none to seven.



Its impact on Health

- An increase in blood pressure in the cold and blood clotting can be fatal for the heart and the brain.
- The cold causes the blood vessels to contract. This is known as vasoconstriction or the narrowing of blood vessels by small muscles in their walls and leads to high blood pressure.
- Heart attacks occur due to blood clot formation in coronary arteries. The fibrinogen levels in our body increase up to 23 per cent during winters. The platelet count increases as well. This can cause the blood to form clots and lead to a heart attack.
- Hypothermia is caused by prolonged exposure to very cold temperatures as the human body begins to lose heat at a faster pace than it is produced.
- When the human body's internal temperature drops to below 35 degrees Celsius, it will experience the symptoms of mild hypothermia.
- In case of severe hypothermia (below 28 degrees Celsius), the body may be unconscious and may not seem to have a pulse or be breathing. It will be dangerously close to death.

What is heat wave?

- A heatwave is a condition of air temperature, which becomes fatal to human body when exposed. It is also defined based on the temperature threshold over a region in terms of the actual temperature or its departure from normal. In certain countries, it is defined in terms of the heat index based on temperature or humidity or based on extreme percentile of the temperatures.

Pineapple Express

Why in News

California and other parts of the West Coast of the US have been hit with a series of what meteorologists call atmospheric rivers caused by a "true Pineapple Express".

Important Points

- The Pineapple Express is a well-known atmospheric river which brings moisture from the tropical Pacific, near Hawaii, to the West Coast of the United States and Canada.
- It is a specific example of a common atmospheric phenomenon that resembles a conveyor belt for moisture.
- These rivers in the sky occur often on the West Coast but can happen in other locations, including the eastern United States, where they often channel moisture from the Caribbean. And they carry a lot of moisture — enough water vapor to equal or sometimes exceed the average flow of the Mississippi River at the point where it flows into the Gulf of Mexico.

- When this moisture begins to interact with land, it can fall as rain or snow. Often, as is the case lately in California, the precipitation is abundant because these atmospheric rivers provide a continuous flow of moisture.
- Although atmospheric rivers come in different shapes and sizes, for one to be a “true Pineapple Express,” location matters.
- The tail end, where the moisture is pulled into the atmosphere, must start near Hawaii. Then the river must stretch continuously through the atmosphere to the U.S. West Coast.
- Whether an atmospheric river is a Pineapple Express or not, the result is something like a conveyor belt for precipitation.
- When the rivers are particularly strong or come back-to-back in what are called “atmospheric river families” the effects can be serious, like the extensive flooding that California is experiencing now.



Neelakurinji a protected plant now

Why in News

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

Important Points

- According to MoEF, those who uproot or destroy the plant will invite a fine of Rs 25,000 and three years’ imprisonment.
- According to the order, the cultivation of Neelakurinji and its possession is not allowed.
- Neelakurinji was included on the list when the Centre expanded the earlier protected list of six plant species to 19.
- Normally, the Chief Wildlife Warden issues a statement to the effect that destroying Neelakurinji plants and flowers is a punishable offence under the Wildlife Protection Act and action will be taken accordingly.

About Neelakurinji

- Neelakurinji or *Strobilanthes kunthiana* means ‘Blue Mountain’, literally the mountain where the flower blooms and turns into a blue/ purple colour.
- These flowers belong to a shrub that is particularly found in the Shola forests of the Western Ghats in Karnataka, Kerala, and Tamil Nadu.
- Most of these species have a unique flowering cycle, resulting from an annual to a 16-year blooming cycle.
- The purplish blue flower blossoms only once in 12 years, and gave the Nilgiri Mountains its name, from the Tamil language Kurinji (flower). a small shrub, blooms once in twelve years, covering the hillsides with bluish flowers, giving the Nilgiris its name.
- *Strobilanthes kunthiana* is the most rigorously demonstrated, with documented bloomings in 1838, 1850, 1862, 1874, 1886, 1898, 1910, 1922, 1934, 1946, 1958, 1970, 1982, 1994, 2006 and 2018, these have no match to Solar cycles.
- The Paliyan tribal people living in Tamil Nadu used it as a reference to calculate their age.
- The plant is endemic to a small stretch in the Western Ghats from the Mangaladevi hills to the Nilgiris hills.
- In the Western Ghats region, nearly 70 varieties of Neelakurinji plants have been identified. The most popular Neelakurinji is *Strobilanthes kunthiana* which blooms once in 12 years.
- However, some other rare varieties of Neelakurinji are also found in the Western Ghats region.
- The most recent blooming of Neelakurinji was over a vast area on the Kallippara hills at Santhanpara in Idukki. An expert team had identified six varieties of the plant across the mountains.
- The Eravikulam National Park, near Munnar, is known for widespread blooming of the kurinji, with the next flowering season expected in 2030.



Schedules of the Wildlife (Protection) Act, 1972

- It has six schedules which give varying degrees of protection. Schedule I and part II of Schedule II provide absolute protection – offences under these are prescribed the highest penalties.
- Species listed in Schedule III and Schedule IV are also protected, but the penalties are much lower.
- Animals under Schedule V, e.g. common crows, fruit bats, rats and mice, are legally considered vermin and may be hunted freely.
- The specified endemic plants in Schedule VI are prohibited from cultivation and planting.

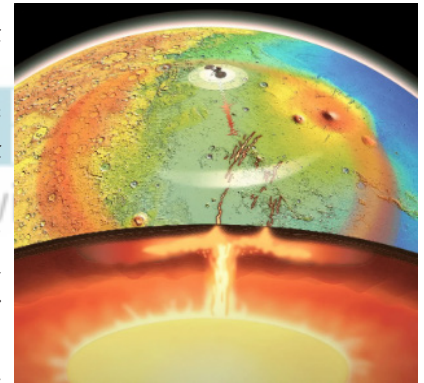
Evidence of mantle plume beneath the surface of the red planet

Why in News

A new study shows evidence of what could be an active mantle plume beneath the surface of the red planet.

Important Points

- Scientists have often considered Mars to be a dead planet due to the lack of the geological activity that rocks Earth and Venus.
- The study presents multiple lines of evidence that reveal the presence of a giant active mantle plume on present-day Mars.
- According to the evidence found by the scientists, the mantle plume is situated underneath a low-lying area called Elysium Planitia that lies north to the equator.
- Though an otherwise indistinctive area, scientists found unexpected evidence of geological activities in Elysium in the recent past.
- Mantle plumes are large blobs of molten rock that rise towards the surface from the interiors of a planet.
- They push through the intermediate or mantle layers and accumulate at the base of the crust.
- This geological phenomenon can be witnessed on Earth in Hawaii where the warm materials from the plume ooze out of fissures to create great volcanic plains.
- The researchers have noted that the predominant view is that Mars is essentially dead today as most of its geological activity, which created some of the tallest volcanoes in the solar system, happened three to four billion years ago.
- Though there is little activity in the form of quakes (marsquakes) or volcanic eruptions now, these have mostly been attributed to the passive processes on a cooling planet.
- As compared to the otherwise silent planet, Elysium Planitia has experienced large eruptions in the last 200 million years. It holds evidence of the youngest volcanic eruption on Mars.
- It created a small explosion of volcanic ash around 53,000 years ago.
- Studying the data from NASA's InSight lander, scientists found that the volcanic eruptions at Elysium Planitia originate from a set of fissures called Cerberus Fossae that stretch for more than 1278 kilometres (800 miles) across the planet's surface.
- They also found that most marsquakes emanate from this region.
- According to the data from Elysium Planitia, the force of the mantle plume is thought to have raised the surface by more than a mile, making it one of the highest points in the lowlands of Mars' northern hemisphere.
- They also applied a tectonic model to the region and discovered that the creation of the Cerebrus Fossae could only be explained by the existence of a massive mantle plume that was 4,023 km (2,500 miles) wide.
- The floor of impact craters being tilted in the direction of the plume also supported the hypothesis that something pushed the craters to the surface well after their formation.



Energy Technology Perspectives 2023

Why in News

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

Important Points

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



What is green steel?

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

Remains of four species of dinosaurs found in Chilean valley

Why in News

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

Important Points

- The fossils were found in Cerro Guido, in southern Chile's Las Chinas valley near the border with Argentina, and taken to a laboratory in 2021.
- The researchers said they belong to dinosaurs that have not previously been identified in the area.
- Inach collaborated with the University of Chile and the University of Texas on the expedition.
- They identified the remains including teeth and postcranial bone pieces -of four species of dinosaur including the megaraptor, which belongs to the theropod family.
- These carnivorous dinosaurs had raptor claws, small teeth for tearing, and large upper limbs which, according to the research, put them at the top of the food chain in the region, which they inhabited between 66 and 75 million years ago, at the end of the Cretaceous period.
- They also identified two specimens of Unenlagiinae, closely related to velociraptors and which have a “novel evolutionary character, which would indicate that this is a new species of unenlagine or perhaps a representative of a different clade (group).
- They also found remains of two bird species: an Enantiornithe, the most diverse and abundant group of birds of the Mesozoic; and Ornithurinae, a group directly related to present-day birds.
- Theropods are the classic bipedal carnivorous dinosaurs, from Coelophysis to Tyrannosaurus, and also include birds. Sauropodomorphs include the enormous quadrupedal, herbivorous long-necked, long-tailed sauropods (Brachiosaurus, Diplodocus) and their cousins the “prosauropods”.



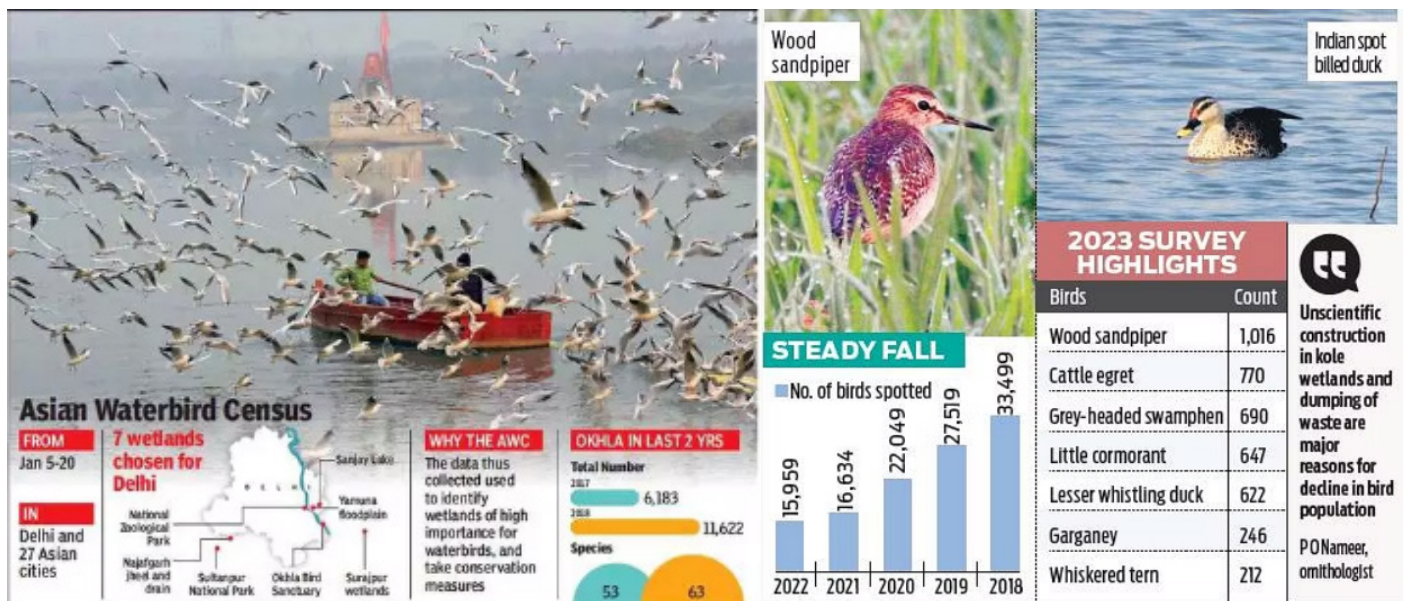
Asian WaterBird Census 2023

Why in News

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

Important Points

- A shift in migration patterns of waterbirds appears to be taking place as revealed by a recent survey conducted in the northern parts of Alappuzha.
- It showed that the populations of some migratory waterbirds, especially duck species, visiting the region are falling.
- The survey jointly organised by the Social Forestry wing of the Forest department and Birders Ezhupunna, a birdwatching group, recorded 15,335 birds of 117 species. Last year, the survey sighted some 9,500 birds.
- The most shocking aspect was that duck species like Northern Shoveler, Common teal and Eurasian wigeon, sighted in the previous surveys, were totally missing this time around.
- Climate change has affected the number of birds visiting the region.
- The survey was also conducted at Soor Sarovar Wildlife Sanctuary and found that lesser migration of winter migratory water birds from far Central Asia and North Asia, including Russia and Siberia, was recorded this year in comparison to previous years.
- Agra Both Great White Pelicans and Dalmatian Pelicans arrived at Soor Sarovar Wildlife Sanctuary in a lesser number this year compared to the previous year.
- Soor Sarovar is one of 467 IBA Sites (Important Bird & Biodiversity Area) in India having rich birdlife diversity.



About the Asian Waterbird Census(AWC)

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

Wetlands International

- It is the only global not-for-profit organisation dedicated to the conservation and restoration of wetlands.
- Its vision is a world where wetlands are treasured and nurtured for their beauty, the life they support and the resources they provide.

- It is dedicated to maintaining and restoring wetlands— for their environmental values as well as for the services they provide to people.
- It works through our network of offices, our partners and experts to achieve our goals. Most of our work is financed on a project basis by governments and private donors.
- It is also supported by government and NGO membership.

Global Risk Report-2023

Why in News

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

Important Points

- The WEF report has been released ahead of the organisation’s flagship annual meeting. This year, it is titled as Cooperation in a Fragmented World and will be held from January 16-20, 2023 at the Swiss resort of Davos.
- According to this report, ‘Natural disasters and extreme weather events’ is the second-most severe risk that the world needs to be prepared for in the next two years.
- It alerted that over the next 10 years or by 2033, the interconnections between biodiversity loss, pollution, natural resource consumption, climate change and socioeconomic drivers will make for a dangerous mix.
- In the meantime, the current global pandemic and war in Europe has been held responsible for the energy, inflation and food crises. In fact, ‘cost of living’ ranks as the top most serious global risk in the short term (over the next two years).
- ‘Global risk’ is defined as the possibility of the occurrence of an event or condition which, if it occurs, would negatively impact a significant proportion of global gross domestic product, population or natural resources, according to the WEF.
- The findings by the WEF are concerning since the impact of natural disasters or extreme weather events disproportionately affects low- and middle-income countries.
- Such events figure among the top five risks in 25 countries, especially developing coastal countries across Latin America, Africa and South-East Asia including India.
- In 10 countries, natural disasters and extreme weather events were perceived to be the top most severe risk in the short term or in the next two years.
- The world has struggled to make the required progress on climate change despite 30 years of global climate advocacy and diplomacy, the WEF report flagged.
- This has been reflected in the WEF Global Risks Report itself for a decade now. ‘Failure on climate action to address climate change’ has continued to figure among the top risks in the report since 2011.
- It also warned that the world may see a ‘polycrisis’ centred around natural resource shortages by 2030.
- The report was produced in partnership with Marsh McLennan and Zurich Insurance Group.

Global Risks Report 2023

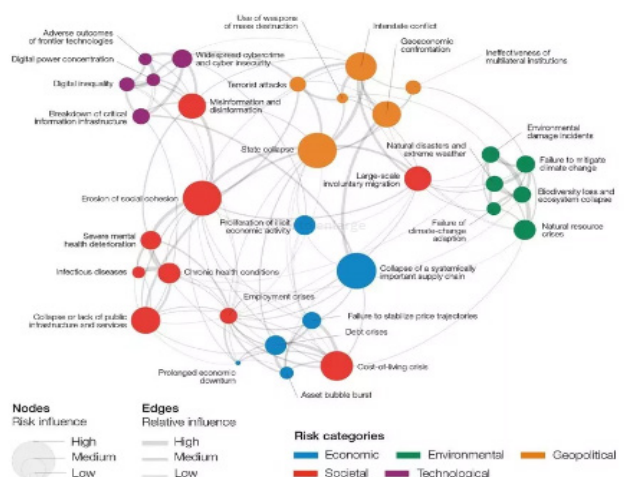
Top 10 Risks

“Please estimate the likely impact (severity) of the following risks over a 2-year and 10-year period”



Global Risks Report 2023

Global risks landscape: an interconnections map



What is a polycrisis?

- While the word polycrisis has been around for long, it has gained traction in the past year. Columbia University historian Adam Tooze is perhaps the most prominent champion of the polycrisis label.
- His explanation of the term is: A problem becomes a crisis when it challenges our ability to cope and thus threatens our identity.
- In the polycrisis the shocks are disparate, but they interact so that the whole is even more overwhelming than the sum of the parts.
- Another explanation of polycrisis would be — when multiple crises in multiple global systems become causally entangled in ways that significantly degrade humanity's prospects.
- These interacting crises produce harms greater than the sum of those the crises would produce in isolation, were their host systems not so deeply interconnected.
- The term polycrisis was first used in the 1990s by French theorist of complexity Edgar Morin.

Green comet

Why in News

Green comet appearing close to Earth after 50,000 years

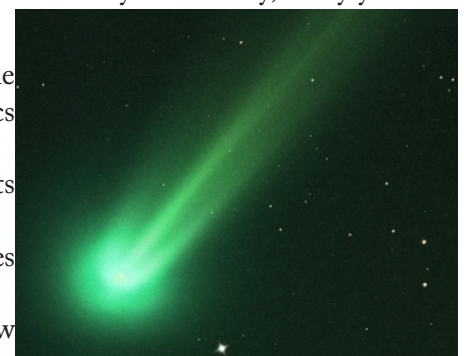
Important Points

Green comet

- The comet is estimated to come closest to Earth around February 2. Termed the C/2022 E3 (ZTF), the comet was named to refer to those who first spotted it – astronomers using the wide-field survey camera at the Zwicky Transient Facility (ZTF) in the US, in March 2022.
- NASA has said the comet could be visible with telescopes and binoculars, and might even be visible to the naked eye under a clear night sky.
- After approaching the sun in the middle of January, it is now moving away from it, along its own orbit.
- The orbit indicates it comes from the edge of our solar system, a distant reservoir of comets scientists call the Oort cloud.
- The Oort cloud is thought to be a big, spherical region of outer space enveloping our sun, consisting of innumerable small objects, such as comets and asteroids.
- NASA terms it “the most distant region of our solar system” and “Home of the Comets”.
- The green comet could be at a distance of 2.5 light minutes from Earth, meaning a “mere” 27 million miles.
- NASA stated that if this one continues its current trend in brightness, it'll be easy to spot with telescopes, binoculars, and in some cases even to the unaided eye under dark skies.
- Observers in the Northern Hemisphere will find the comet in the morning sky, as it moves swiftly toward the northwest during January. It'll become visible in the Southern Hemisphere in early February.
- Coming under the category of long-period comets, which take more than 200 years to orbit the Sun, the green comet is not easily spotted.
- With a highly elliptical orbit, the comet will head back to the Oort cloud and make its next appearance roughly 50,000 years later.
- But given their orbits, it's not unique for comets to reappear close to Earth only after many, many years.

Reasons for its green colour

- Comets are frozen rocky or gas-filled objects that are remnants of the formation of the solar system. Due to their composition, characteristics and the path they move in, they tend to leave a light “behind them”.
- Here, the comet itself is green (called the head of the comet) and emits a whitish light behind it (often called the tail of the comet).
- Just like other bodies in space, comets also have orbits. They are sometimes pulled in close to the sun because of the sun's gravity acting on them.
- NASA explains that as they orbit near the Sun, They heat up and spew gases and dust into a glowing head that can be larger than a planet.
- The remains of dust following this burning up, from a distance, look like a trail of light to humans on Earth. Comets, therefore, have often been seen giving out blue or whitish light, or even green.
- In this case, the green glow is thought to arise from the presence of diatomic carbon – pairs of carbon atoms that are bound together – in the head of the comet. The molecule emits green light when excited by the ultraviolet rays in solar radiation.



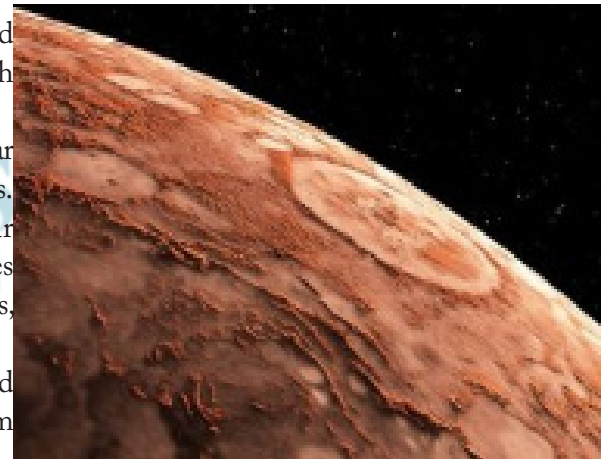
The first evidence of the presence of solitary waves in Mars reported

Why in News

Scientists have reported the first evidence of the presence of solitary waves or distinct electric field fluctuations in the Martian magnetosphere.

Important Points

- Despite several global missions to Mars, the presence of solitary waves in the Martian magnetosphere had never been reported by any space agency or institute in the world.
- For the first time, a research team from the Indian Institute of Geomagnetism (IIG), an autonomous institute of the Department of Science and Technology (DST), has identified and reported the solitary waves in the Martian magnetosphere with the help of high-resolution electric field data recorded by Langmuir Probe and Waves instrument on the Mars Atmosphere and Volatile EvolutioN (MAVEN) spacecraft of NASA.
- The study of these waves is crucial as they directly control particle energization, plasma loss, transport, etc., through wave-particle interactions.
- Our Earth is a giant magnet, and its magnetic field protects us from high-speed charged particles that are continuously emitted from the Sun in the form of solar wind.
- Unlike Earth, the planet Mars does not have any intrinsic magnetic field. This allows the high-speed solar wind to interact directly with the Mars atmosphere, like an obstacle in flow.
- It has been suggested that even in a weak and thin magnetosphere as that of Mars, one can observe frequent occurrences of solitary waves.
- The magnetosphere is weak but highly dynamic and formed due to the direct interaction of solar winds with the Martian atmosphere.
- Solitary waves are the distinct electric field fluctuations (bipolar or monopolar) that follow constant amplitude-phase relations.
- Their shape and size are less affected during their propagation. The magnitude and duration of these pulses are found to be 1-25 milivolt/meter and 0.2-1.7 milliseconds, respectively.
- These pulses are dominantly seen in the dawn and afternoon-dusk sectors at an altitude of 1000-3500 km around Mars.
- The dominant occurrence of solitary waves in the dawn and dusk sector is still a mystery and needs further investigation.
- Through simulations, it is found that the spatial extent of these structures is very small (30-330 meters).
- As these waves are known to be responsible for the plasma energization and its transport in Earth's magnetosphere, the team is further exploring their role in the particle dynamics in the Martian magnetosphere and whether such waves play any role in the loss of atmospheric ions on the Mars.



Chapter- 4

ECONOMY

New Umbrella Entity

Why in News

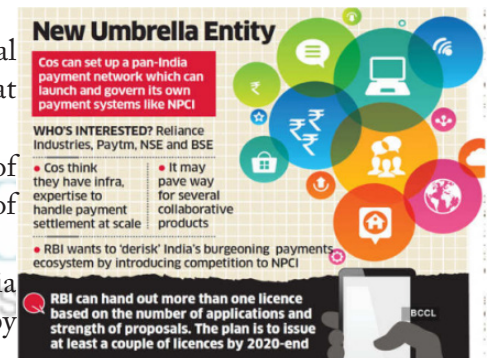
The Reserve Bank of India (RBI) has put on hold licensing of the New Umbrella Entity (NUE) network, a fintech institution planned as a rival to National Payments Corporation of India (NPCI).

Important Points

- Six groupings, which included Facebook, Google, Amazon, Flipkart and others, had applied for NUE licences.
- An NUE licence was expected to help the participating entity gain greater autonomy in processing digital payments in India.
- The licence would help establish a firm presence in the financial services ecosystem through value-added lending and insurance services.

About NUE

- NUEs were supposed to set up and operate a new retail digital payment system and manage clearing and settlement systems that could be an alternative to the bank-promoted NPCI.
- The NUE license shall be granted by RBI according to the power of authorization of payment operations conferred under Section 4 of the Payment & Settlement Systems Act ('PSSA'), 2007.
- The NUE shall be a Company authorised by Reserve Bank of India (RBI) under Section 4 of the PSS Act, 2007. It shall be governed by the provisions of the PSS Act.
- These NUEs would be primarily responsible in developing new payment systems, standards and technologies, clearing and settlement mechanisms, while monitoring, addressing and preventing relevant risks and frauds.
- It would diversify easy payment options beside boosting transaction volumes with tremendous expansion of e-commerce.
- Thus, NUE could also become instrumental in furthering financial inclusion and promotion of fintech.
- The RBI had in 2020 issued guidelines for corporates to create for-profit NUEs with an aim to foster competition and “de-risk” India’s burgeoning digital payments ecosystem, where much of the settlement burden has fallen on the non-profit NPCI over recent years.
- As per the rules, no single promoter could have over 40% stake, which had to be lowered to less than 25% in five years of operation.
- The entity also needs a paid-up capital of Rs 500 crore to get RBI approval.
- As per RBI guidelines, to set up new pan-India umbrella entity / entities focussing on retail payment systems. Such an entity shall be a Company incorporated in India under the Companies Act, 2013.



About NPCI

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

Sovereign Green Bonds

Why in News

The Reserve Bank of India (RBI) announced to issue Sovereign Green Bonds (SGrBs).

Important Points

- The Reserve Bank of India (RBI) will auction Rs16,000 crore of sovereign green bonds (SGrBs) in two tranches, the central bank announced.
- The RBI will auction 5-year and 10-year green bonds worth Rs 4,000 crore each and this would be a uniform price auction.
- The Reserve Bank of India, in consultation with the Government of India, has decided to notify the indicative calendar for issuance of SGrBs for the fiscal year 2022-23.
- In line with the ambition to significantly reduce the carbon intensity of the economy, the Union Budget for 2022-23 had mentioned about SGrBs.

Green bonds

- Green bonds are financial instruments that generate proceeds for investment in environmentally sustainable and climate-suitable projects.
- Green Bonds will help the government in tapping the requisite finance from potential investors for deployment in public sector projects aimed at reducing the carbon intensity of the economy.
- The objective of Sovereign Green Bonds is to mobilise resources for green infrastructure as part of the government's overall market borrowings in 2022-23.

The features of the SGrB issuance will be as below:

- Issuance Method: SGrBs will be issued through Uniform Price Auction.
- Non-competitive bidding facility: Five per cent of the notified amount of sale will be reserved for retail investors as specified under the 'Scheme for Noncompetitive Bidding Facility in the auction of Government of India Dated Securities and Treasury Bills'.
- Eligibility for Repurchase Transactions (Repo): SGrBs will be eligible for Repurchase Transactions (Repo) as per the terms and conditions mentioned in Repurchase Transactions (Repo) (Reserve Bank) Directions, 2018 as amended from time to time.
- Eligibility for Statutory Liquidity Ratio (SLR): SGrBs will be reckoned as eligible investment for SLR purpose.
- Underwriting: The underwriting in the auction of SGrBs by the Primary Dealers will be as per the "Revised Scheme of Underwriting Commitment and Liquidity Support" issued by the Reserve Bank vide circular No.RBI/2007-08/186 dated November 14, 2007, as amended from time to time.
- When-issued Trading: SGrBs will be eligible for "When Issued" trading in accordance with the guidelines on 'Transactions in the When Issued market in Central Government Securities' issued by the Reserve Bank of India vide circular dated July 24, 2018, as amended from time to time.
- Tradability: SGrBs will be eligible for trading in the secondary market.
- Investment by Non-residents: SGrBs will be designated as specified securities under the 'Fully Accessible Route' for investment in Government Securities by non-residents.



Coal Ministry relaxation in Performance Bank Guarantee

Why in News

Coal Ministry Offered relaxation in Revision of Performance Bank Guarantee and extended Bid due date for Commercial Coal Block auction upto January 30.

Important Points

What is a Performance Bank Guarantee?

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

- Since NCI has become double since the launch of first commercial coal mine auctions in 2020, several representations were received from the industry for relaxation in PBG revision provisions.
- It was requested that unprecedented increase in NCI has led to significant financial burden on successful bidders, whose mines are in the pre-operationalisation stage, impacting fund availability for mine operationalisation activities.

About the National Coal Index (NCI)

- The NCI is a price index which reflects the change of price level of coal on a particular month relative to the fixed base year.
- NCI is a price index combining the prices of coal from all the sales channels- Notified Prices, Auction Prices and Import Prices.
- The base year for the NCI is FY 2017-18.
- The concept and design of the Index as well as the Representative Prices have been developed by the Indian Statistical Institute, Kolkata.
- NCI is composed of a set of five sub-indices: three for Non Coking Coal and two for Coking Coal.
- The three sub-indices for Non Coking Coal are combined to arrive at the Index for Non Coking Coal and the two sub-indices for Coking Coal are combined to arrive at the Index for Coking Coal.
- Thus, indices are separate for Non-coking and Coking Coal.
- As per the grade of coal pertaining to a mine, the appropriate sub-index is used to arrive at the revenue share.



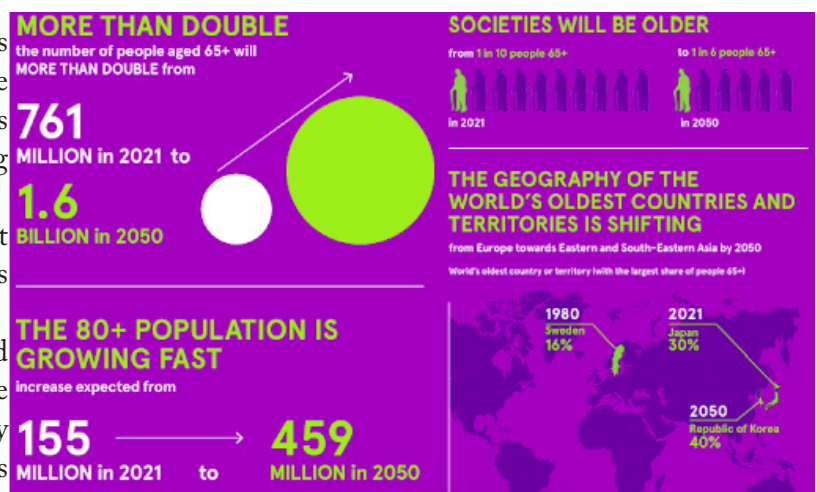
World Social Report 2023

Why in News

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

Important Points

- The report calls for concrete measures to support the greying global population, amidst escalating pension and healthcare costs.
- In 2021, 761 million people worldwide were aged 65 and older, which will rise to 1.6 billion by 2050. The number of people aged 80 years or older is growing even faster.
- Globally, a child born in 2021 can expect to live, on average, to age 71, with women living longer than men. This is nearly 25 years more than a baby born in 1950.
- Northern Africa, Western Asia and sub-Saharan Africa, are on track to experience the fastest growth in the number of older people over the next 30 years. Today, Europe and Northern America combined, have the highest share of this population.
- However, the report points to inequalities in our ageing world, because not everyone has benefited equally from the improvements in health and education that are driving this transformation.
- While many older people are in excellent health or “economically active”, others live with ailments or in poverty.
- In more developed regions, pensions and other public transfer systems provide over two thirds of the consumption by older persons. Their counterparts in less developed regions tend to work longer and rely more on accumulated assets or family assistance.
- Life expectancy is strongly influenced by factors such as income, education, gender, ethnicity and place of residence.



- Some combinations of these factors have too often led to systemic disadvantage that begins early in life.
- The report recommends that countries rethink long-held policies and practices associated with livelihoods and work.

UN Department of Economic and Social Affairs (UN DESA)

- Rooted in the United Nations Charter and guided by the transformative 2030 Agenda for Sustainable Development, the UN DESA upholds the development pillar of the United Nations.
- It brings the global community together to work towards common solutions to the world's most pressing problems.
- It helps countries translate their global commitments into national action in the economic, social and environmental spheres.
- UN DESA is a pioneer of sustainable development and the home of the Sustainable Development Goals (SDGs), where each goal finds its space and where all stakeholders can do their part to leave no one behind.
- It is a leading analytical voice for promoting inclusion, reducing inequalities and eradicating poverty, and a champion for tearing down the barriers that keep people in poverty.
- It helps countries make informed decisions by providing a wealth of information through its publications and databases and through our support for international deliberations at the United Nations General Assembly, Economic and Social Council (ECOSOC), Commissions, Forums and other bodies.

Indian Railways deal with Siemens for high horsepower engines

Why in News

Rs 26,000-cr deal with Siemens for high horsepower engines.

Important Points

- Taking a leaf out of some international models of manufacturing and procurement, Indian Railways has partnered with global mobility solutions major Siemens to produce 1,200 high horsepower electric locomotives at an overall cost of around Rs 26,000 crore.
- While Railways has had such arrangements before, notably with other global majors like Alstom and General Electric to procure locomotives from factories in Bihar's Madhepura and Marhowra respectively, the pact with Siemens is special because this model is new in India.

What is new?

- For starters, the supplier, that is Siemens, has no capital expenditure liability in this contract.
- This is because all the locomotives will be manufactured in Railways' newly built factory in Dahod, Gujarat.
- The manpower in the factory will also be supplied by Railways.
- Siemens will bring in material procurement, supervision and the technology to make the 9,000 horsepower engines.
- Regular Railways locomotives have between 3,000 and 6,000 horsepower.
- The ones being made in Madhepura are 12000 horsepower strong while those in Marhowrah are of 6,000 horsepower each.
- In the Madhepura-Marhowra projects, the then innovative model for which was finalised as early as 2008 but the factory finally took off around 2015, Railways gave land for the factory whereas the technology partners did everything else, including setting up the factory and supplying the manpower.
- This was called Procurement cum Maintenance Agreement, whereas the current one with Siemens is called Manufacture cum Maintenance Agreement.
- The contract is for 35 years, including maintenance, which is pretty much the entire lifecycle of the engines.
- There is also the added advantage that this, like in Madhepura-Marhowrah, is an "assured offtake" model, wherein, all the 1,200 engines are pre-bought by the client, so there is zero risk.
- Globally, another transportation solutions major Bombardier has a somewhat similar model called FlexCare, for engagement with clients on long-term maintenance of the vehicles it makes.



When do these engines start rolling out?

- The first engine will take two years to come out because setting up the factory will take that much time.
- The network operator also needs the appetite for absorbing the engines, which is based on the currency of its existing stock.
- Considering that, the roll-out has been staggered over 11 years.
- Starting with around five a year, the factory will be churning out 160 engines per year in the final couple of years.
- Additionally, Siemens will also carry out maintenance of these engines at depots in Visakhapatnam, Raipur, Kharagpur, Pune using Railways manpower.
- Siemens will also ensure 95 per cent availability and 1,50,000 km of trouble-free operation of the locomotives before any maloperation can take place, as the guaranteed Key Performance Indicators under the contract.

How does Indian Railways benefit?

- Indian officials say that the agreement will ensure upskilling of Railway production manpower as well as technology upgrade of its own production capability. Two of the 1,200 locomotives have been earmarked for export, to test international market potential.
- The logic, in the “Make in India” ecosystem, is that if Railways straightaway purchased from a technology vendor, its own manpower and production systems would not benefit.

How to use these engines?

- Indian Railways is calling these high horsepower (9000 HP) locomotives “future workhorse” for freight operation.
- These locomotives are planned for use primarily on the Western dedicated freight corridor and on graded sections of Railways for hauling container freight trains at steep gradients and improve the average speed of such trains to around 50-60 kmph over the existing 20-25 kmph.

What about diesel engines?

- India under the Modi government has taken the policy decision to gradually electrify 100 per cent of its broad gauge rail network of around 66,000 km.
- As a result, there is a move to slowly retire end-of-life diesel locos.
- However, Railways will keep a stock of around 2,000 high horsepower diesel locomotives for various needs, like contingencies, linking and other operations necessities.

Oxfam Report - ‘Survival of the Richest’

Why in News

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

Important Points

- According to the latest report, just 5 per cent of Indians own more than 60 per cent of the country’s wealth, while the bottom 50 per cent of the population possess only 3 per cent of the wealth.
- It also says that between 2012 and 2021, 40 per cent of the wealth created in India has gone to just 1 per cent of the population.
- It has revealed that only a mere 3 per cent of the wealth has gone to the bottom 50 per cent, adding that the total number of billionaires in India increased from 102 in 2020 to 166 billionaires in 2022.
- The combined wealth of India’s 100 richest has touched \$660 billion (Rs 54.12 lakh crore) an amount that could fund the entire Union Budget for more than 18 months.
- While the number of hungry Indians increased to 350 million in 2022 from 190 million in 2018.
- The widespread hunger is resulting in 65 per cent of the deaths among children under the age of 5 in 2022.
- The wealth of the top 10 richest in India stands at Rs 27.52 lakh crore (\$335.7 billion, an increase of around \$110 billion which is an 32.8 per cent rise from 2021).
- Following the pandemic in 2019, the bottom 50 per cent of the population have continued to see their wealth chipped away.
- By 2020, their income share was estimated to have fallen to only 13 per cent of the national income and have less than 3 per cent of the wealth.

- Its impact has been exceptionally poor diet, increase in debt and deaths. This is in stark contrast to the top 30 per cent, who own more than 90 per cent of the wealth, with the top 10 per cent owning more than 80 per cent of the wealth concentrated in the top three deciles.
- The wealthiest 10 per cent own more than 72 per cent of wealth, and the top 5 per cent own nearly 62 per cent of the total wealth, which is higher than the pre-pandemic years (2018-19), and the top 1 per cent own more than 13 times the wealth owned by the bottom half of the society, with nearly 40.6 per cent of the total wealth in India.
- Oxfam adds that India has the world's highest number of poor at 228.9 million. On the other hand, the total number of billionaires in India increased from 102 in 2020 to 166 billionaires in 2022.
- Before the pandemic, in 2019, the Central Government reduced the corporate tax slabs from 30 per cent to 22 per cent, with newly incorporated companies paying a lower percentage (15 per cent).
- This new taxation policy resulted in a total loss of INR 1.84 lakh crore and had a significant role in the 10 per cent downward revision of tax revenue estimates in 2019-20.
- To increase revenue, the Union Government adopted a policy of hiking the Goods and Services Tax (GST) and excise duties on diesel and petrol while simultaneously cutting down on exemptions.
- The indirect nature of both the GST and fuel taxes make them regressive, which invariably burdens the most marginalized.
- Oxfam India has said that the failure to tax rich people and corporations fairly exacerbates inequality as governments then resort to taxing the rest of society more.
- Heavy reliance on consumption taxes like VAT increases inequality and is regressive in nature because poor people pay a larger share of their incomes.
- It has said that the bottom 50 per cent of the population at an All-India level pays six times more on indirect taxation as a percentage of income compared to top 10 per cent
- Of the total taxes collected from these food and non-food items, 64.3 per cent of the total tax is coming from the bottom 50 per cent.
- A little less than two-third of the total GST is coming from the bottom 50 per cent, as per estimates, one-third from middle 40 per cent and only three to four per cent from the top 10 per cent.



Draft National Retail Trade Policy

Why in News

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

Important Points

- It is aimed at the overall development of all formats of the sector.
- The policy would focus on formulating strategies to provide a globally competitive and sustainable environment for the overall development of retail trade through targeted efforts.
- The objectives of the policy include
- Ensuring easy and quick access to affordable credit.
- Facilitating modernization and digitisation of retail trade by promoting modern technology and superior infrastructural support.
- Development of physical infrastructure across the distribution chain.
- Promotion of skill development and improve labour productivity.

- Providing an effective consultative and grievance redressal mechanism for the sector.
- The government plans to put in place a single window clearance mechanism to acquire all registrations, licences or clearances for retail trade, and a Centralised Computerized Inspection Management System for inspections of retail entities.
- The draft also proposes an Accident Insurance Scheme for Traders to protect them from any untoward incidents besides setting up Traders Welfare Board at national, state and district levels.
- The policy is not intended for e-commerce, direct selling, multi-level marketing or street vendors and the government intends to provide a national common framework for development of retail sector across the country through it.
- As per the draft policy, efforts will be made to replace licenses with a simple registering process and panIndia acceptance of a license issued by one state will be encouraged.
- The department has suggested review of eight laws including trade License, Insecticides Act, 1968, Consumer Protection Act, 2019 and License for Drugs and Cosmetics Act, 1940 to reduce the compliance burden and decriminalise minor technical or procedural offences.
- According to the draft, the government will promote indigenous manufacturing of retail related modern fixtures, digital equipment, devices and solutions and management tools while retailers will be encouraged to adopt the Open Network for Digital Commerce.
- India is the world's fifth-largest global destination in the retail space.
- A cohesive national retail policy can help generate 30 lakh more jobs by 2024.
- The retail industry is likely to see 10 per cent annual growth to reach about USD 2 trillion by 2032.



Caller Name Presentation (CNAP) proposal by TRAI

Why in News

Telecom operators have said that the CNAP proposal by the Telecom Regulatory Authority (TRAI) of India to display callers' names could have privacy implications.

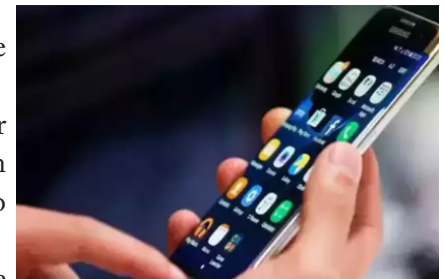
Important Points

About Caller Name Presentation (CNAP)

- In November 2022, TRAI floated a consultation paper seeking comments about the potential introduction of CNAP.
- The feature will allow users to know the identity of the person when they call them.
- The basic idea is that if people are aware of the person who is calling them, they can make an informed choice about those calls.
- At the same time, such a feature could potentially help in curbing harassment and other spam calls.
- Currently, there are some applications which offer a similar service, for instance, Truecaller.
- However, all of them are third-party apps and depend on crowd-sourced data. There is no unifying solution offered by telecom operators.

Key proposals by TRAI

- The regulator has proposed four possible methods through which the CNAP feature can be rolled out:
- The first model includes telcos managing a CNAP database of their respective subscribers and when its user makes a call to a user on another network, extract their data from the database and present it to the receiving telco's user.
- The second model is similar to the first one except that in this case, the operator through which the call is made will permit the receiving operator to access its CNAP database.
- In the third model, TRAI has envisaged a third party operating a centralised database. In this case, the receiving operator would be responsible to delve into the centralised database to retrieve and present the caller's data.
- The fourth model would require that each telco retain a copy of a synchronised central database operated by a third party.



Opposition to the proposal

- Telcos seem to be in two minds over the proposed feature, saying that it has both privacy risks and could become a complex technical exercise.
- They have largely said that the feature should be optional. Concerns have been raised over different aspects.
- According to the Telecom operators, the proposal, called CNAP, will be difficult to execute from a technical perspective given that a number of phones in the Indian market may not be able to support it.
- Meanwhile, Truecaller, which already offers a similar service albeit through a crowdsourcing model has said since several people purchase SIM cards using forged identity cards, TRAI's proposal to use SIM registration data to display callers' names might be fraught with inaccuracies since the identity of the actual user of a mobile number may not be the same as the subscriber.
- The Cellular Operators Association of India (COAI), a trade body representing Airtel, Jio and Vodafone Idea has said that given that handset manufacturers and Operating System (OS) providers have control over the data obtained through the CNAP facility, this could result in the breach of subscriber data privacy as the manufacturers of mobile devices and OS providers would amass subscriber data for the entire country
- The Internet and Mobile Association of India (IAMAI), which represents digital industry firms, echoed a similar sentiment and pointed out that women in particular could be the most vulnerable.
- COAI said that a significant obstacle in implementing CNAP would be the fact that time-division multiplexing (TDM) based interconnection between telcos does not support CNAP.
- Further, there are no standards for CNAP over 2G/3G networks and hence, there is no ready solution available for it.
- Another major challenge is with regard to handsets as not all handsets are capable of supporting CNAP functionalities.



TRANSFORM IAS
Transforming Lives with Education

Chapter- 5

SCIENCE AND TECHNOLOGY

TDE

Why in News

Tidal disruption event or destruction of a star by a black hole

Important Points

- Telescopes operated by National Aeronautics and Space Administration (NASA) recently observed a massive black hole devouring a star.
- The incident was the fifth-closest example of a black hole destroying a star and occurred 250 million light-years from the earth, in the centre of another galaxy.

What is Tidal disruption event?

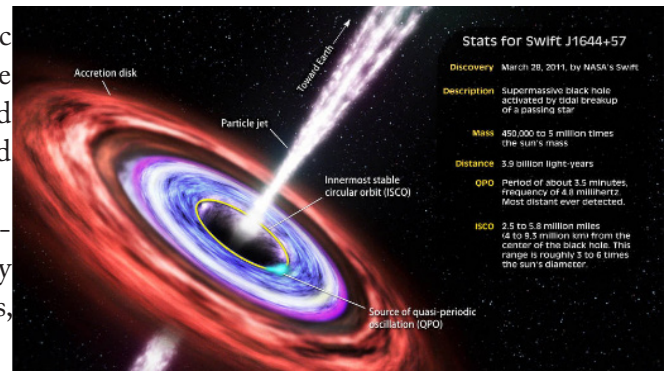
- The astronomical phenomenon of the destruction of a star by a black hole is formally called a tidal disruption event (TDE).
- A tidal force is the difference in the strength of gravity between two points. If the tidal force exerted on a body is greater than the intermolecular force that keeps it together, the body will get disrupted.
- During a TDE, the tidal force of a black hole disrupts the star in vicinity. While about half of the star's debris continues on its original path, the other half is attracted by the black hole's gravitational pull.
- The gradual growth of this material bound to the black hole produces a short-lived flare of emission, known as a tidal disruption event.
- The incident was the fifth-closest example of a black hole destroying a star and occurred 250 million light-years from the earth, in the centre of another galaxy.
- In the recently-observed example, a dramatic rise in high-energy X-ray light around the black hole was seen once the star was completely ruptured by the black hole's gravity.
- This indicated the formation of an extremely hot structure above the black hole called a corona. According to the study, the proximity of the aforementioned TDE provided a spectacular view of the corona's formation and evaluation.
- The event is formally called AT2021ehb, and took place in a galaxy with a central black hole about 10 million times the mass of our sun.
- It was first spotted on March 1, 2021, by the Zwicky Transient Facility in Southern California.
- Around 300 days later, the Nuclear Spectroscopic Telescopic Array (NuSTAR) – NASA's most sensitive space telescope capable of observing high-energy X-rays – began observing the system.
- Scientists detected a corona, but they don't know where the plasma comes from or exactly how it gets so hot.
- Coronae usually appear with jets of gas that flow in the opposite direction from a black hole. However, with AT2021ehb, there were no jets.
- TDEs are attractive to astronomers because of their observability and short duration, and the opportunity to study the impact of black hole's gravity on materials around it.
- They are also an important tool to learn how black holes influence their environments.

Tidal Disruption Events

- In a galaxy, roughly once every ten thousand years, a star gets disrupted by the strong tidal forces of the central supermassive black hole.
- About half of the stellar debris continues on its original trajectory, while the other half becomes gravitationally bound and falls back towards the black hole.
- The accretion of this bound stellar material causes a short-lived flare of emission, known as a Tidal Disruption Event (TDE).
- These extreme accretion episodes can be an important tool for understanding how black holes influence their environments as the TDE provides an impulse of accretion after which we can monitor how the system responds, through the formation of a disc, corona, jet or massive outflow.

NuSTAR

- NASA's NuSTAR (Nuclear Spectroscopic Telescopic Array) satellite is the most sensitive space telescope capable of observing these wavelengths of light, and the event's proximity provided an unprecedented view of the corona's formation and evolution.
- The Nuclear Spectroscopic Telescope Array, or NuSTAR, mission studies the universe in high energy X-rays to better understand the dynamics of black holes, exploding stars and the most extreme active galaxies.
- In addition to complementing astrophysics missions studying the universe in various spectra, NuSTAR, the first hard-focusing X-ray telescope to orbit Earth, is expected to greatly improve on observations from ground-based observatories.



NuSTAR science discoveries

- First measurement of black hole spin with high precision
- Untangling the mystery of how stars explode
- The discovery of a shockingly bright dead star
- Staring deep into the hidden lairs of black holes
- Contributed to the first picture of a black hole

Deep tech startups

Why in News

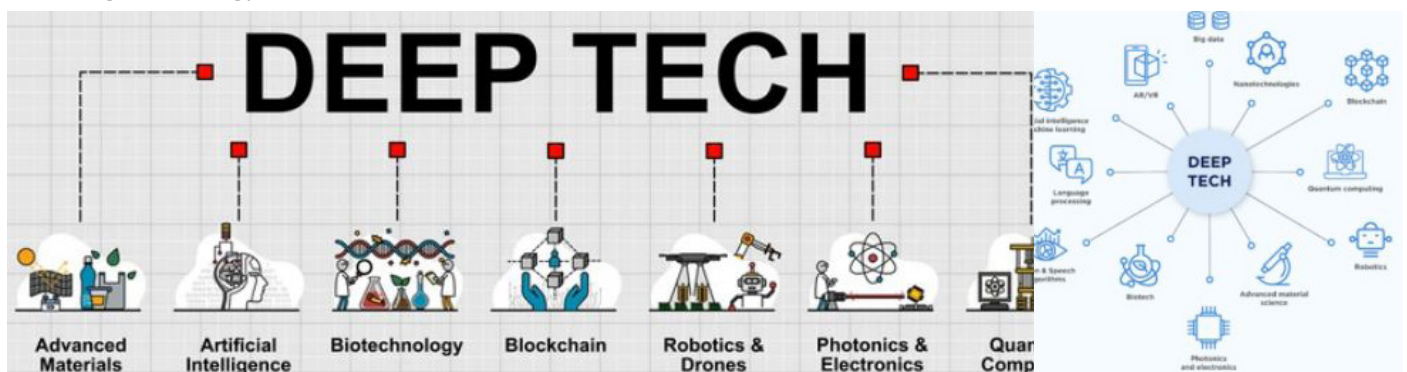
Central government is going to launch a Digital India Innovation Fund that will support deep-tech startups.

Important Points

- Union Ministry said that the central government is going to launch a Digital India Innovation Fund that will support deep-tech startups.

What are deep-tech startups?

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



Deep Tech start-ups in India

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

Ethylene Glycol (Quality Control) Order, 2022

Why in News

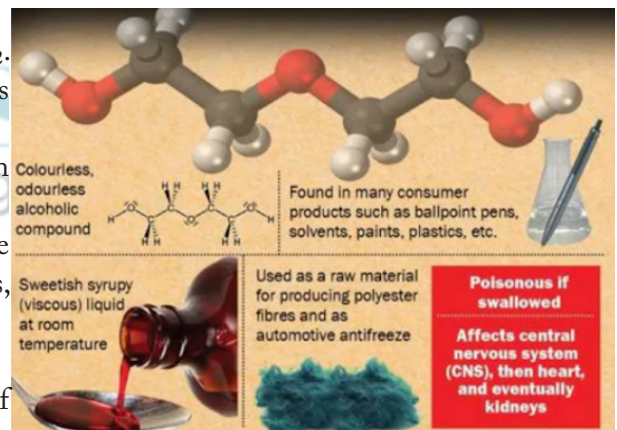
The Department of Chemicals and Petrochemicals with the Ministry of Chemicals and Fertilizers issued a gazette notification titled Ethylene Glycol (Quality Control) Order recently.

Important Points

- The order came a day after Uzbekistan alleged 18 child deaths in Samarkand from consumption of a medicinal syrup manufactured by an Indian drugmaker.
- Marion Biotech, the drug company in question, is based in Noida, Uttar Pradesh. The syrup it manufactured contained ethylene glycol.
- Under 'Conformity to standards and compulsory use of standard mark', the order stated:
- Specific goods or articles shall conform to the corresponding Indian Standard given in column (2) bearing the title of the Indian Standard in column (3) of the said Table and shall bear the Standard Mark under a licence from the Bureau of Indian Standards as per Scheme-I of Schedule-II of the Bureau of Indian Standards (Conformity Assessment) Regulations, 2018.
- The order stated under 'Certification and enforcement authority': "In respect of specific goods or articles, the Bureau of Indian Standards shall be the certifying and enforcing authority."
- Under 'Penalty for contravention', it stated that "any person who contravenes the provisions of this Order shall be punishable under the provisions of the said Act."
- This Order shall apply to any amendment made by the Bureau of Indian Standards to the Indian Standard specified in column (2) of the said Table with effect from the date notified by the Bureau of Indian Standards on this behalf.

What is ethylene glycol?

- It is an organic compound with the formula $(\text{CH}_2\text{OH})_2$. The sweet-tasting ethylene glycol is a syrupy or viscous liquid at room temperature.
- Ethylene glycol is a useful industrial compound found in many consumer products.
- Examples include antifreeze, hydraulic brake fluids, some stamp pad inks, ballpoint pens, solvents, paints, plastics, films, and cosmetics.
- It can also be a pharmaceutical vehicle.
- It is also used as a raw material in the manufacture of polyester fibers and for antifreeze formulations. It is an odorless, colorless, flammable, viscous liquid.



Ozempic

Why in News

Ozempic drug is garnering a lot of attention as a way to lose weight on social media platforms such as TikTok

Important Points

- The dramatic weight loss of Kim and Khloe Kardashian and other celebrities has been rumoured to be the work of an injectable drug, Ozempic, that's been called 'Hollywood's worst kept secret'.
- The business magnate Elon Musk chalked up losing 13.6 kg (30lbs) to Ozempic/Wegovy, fasting and staying away from 'tasty food'.
- The drug is also garnering a lot of attention on social media platforms such as TikTok as an easy way to lose weight.
- In fact, the demand for both Ozempic and Wegovy skyrocketed in 2022, with Novo Nordisk recording a 29% increase in sales driven by GLP-1-based diabetes treatments, especially Ozempic, in the first nine months of 2022.
- A recent report by Bloomberg noted that patients in Southern California who suffered from diabetes had trouble filling their prescription for Ozempic.

- Patients on similar type-2 drugs are also facing the same problem.
- A doctor in Sacramento has taken to prescribing a lower dose and suggested the patient take two injections per week rather than the regular one injection per week as a compromise is ‘better than nothing’.

About the Ozempic

- Ozempic, Wegovy and Rybelsus are the brandnames for an anti-diabetes medication called semaglutide.
- Developed by Danish pharmaceutical company Novo Nordisk, the drug is used to treat patients with type-2 diabetes.
- Wegovy, which contains a higher-dose of semaglutide, was approved as an anti-obesity drug.
- Semaglutide is a glucagon-like peptide-1 receptor agonist (GLP-1 RA) drug that increases the secretion of insulin (which helps decrease blood sugar levels) after a meal while reducing the production of glucagon (which helps increase blood sugar levels).
- Besides regulating glucose levels in the body, the drug also aids in weight loss, lowers the risk of hypoglycemia, and improves heart health and kidney function.
- The drug was approved by the US Food and Drug Administration in 2017.
- According to a 2018 study, semaglutide specifically showed greater weight loss in subjects than other GLP-1 RA drugs.
- It roughly reduced body weight by 4kgs, as compared to other drugs.
- Apart from regulating glucose, it also increases gastric emptying time, meaning food takes longer to pass through the gastrointestinal tract and it makes you feel full for a longer period of time.
- The difference between Ozempic and Wegovy is the dosage.
- Ozempic is given at a lower dose. It starts with 0.25 mg per week and increases over a period of time. For Wegovy, one start with 0.2 mg per week and slowly increase it to 2.4 mg.



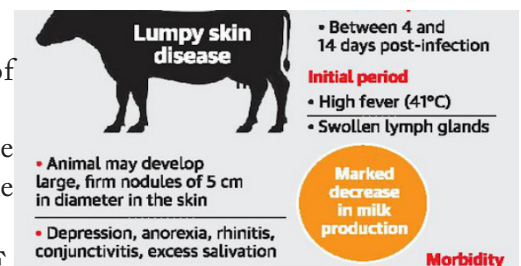
Lumpi-ProVac

Why in News

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

Important Points

- ‘Lumpi-ProVacInd’ is safe in animals and induces LSDV-specific antibody- and cell-mediated immune response, besides providing complete protection against lethal LSDV challenge.
- It is used for the prophylactic immunization of animals against Lumpy Skin Disease, which illicit protection for about one year.
- A single dose of the vaccine contains 103.5 TCID₅₀ of live-attenuated LSDV (Ranchi strain).
- The vaccine is stored at 4°C. The vaccine must be shipped on ice and must be used within a few hours after reconstitution. The patent has been filed by the ICAR for the technology.
- National Centre for Veterinary Type Culture, ICAR-NRCE, Hisar in collaboration with ICAR-IVRI, Izatnagar, UP has developed a homologous live-attenuated LSD vaccine, named Lumpi-ProVacInd.
- Agrinnovate India Limited, the commercial department of Department of Agricultural Research and Education (DARE) under Ministry of Agriculture and Farmers’ Welfare granted “Non-Exclusive Rights” for Commercial production of “Lumpi-ProVac”, to Institute of Veterinary Biological Products (IVBP) recently.



What is Lumpy Skin Disease?

- Lumpy skin disease (LSD) is a contagious viral disease of cattle and buffalo that causes relatively low mortality.
- It does not affect humans. The disease can result in animal welfare issues and significant production losses.

- The lumpy skin disease virus (LSDV) is a virus of the capripoxvirus genus in the poxviridae family.
- It is transmitted by insects that feed on blood, like mosquitoes, ticks, and certain species of flies. Lumpy skin disease also spreads through contaminated fodder and water.
- The disease causes fever, nodules on the skin and can be fatal, especially in animals that have never been exposed to the virus.
- The Lumpy Skin Disease has been reported in India from 2019 while the first case was reported in the state of Odisha. After that, it has spread to multiple states in the country.
- It rapidly spread in Gujarat, Rajasthan, Punjab, Haryana, Uttar Pradesh, Uttarakhand, Madhya Pradesh, and Jammu and Kashmir.
- In 2019, death of a large number of cattle was reported from different states with high morbidity, especially in the North-West region of the country.
- Currently, the disease has been controlled and contained with the available Goat Pox vaccine in the country.

Virovore

Why in News

Researchers have claimed that they have found the first known “virovore”- an organism that eats viruses.

Important Points

- Every sort of organism that can be discovered in the world feeds on organic matter. This is most likely a lot more like a complete, unexplored food chain.
- Scientists found that a species of Halteria - microscopic ciliates that populate freshwater worldwide - can eat huge numbers of infectious chloroviruses that share their aquatic habitat.
- For the first time, the team’s lab experiments have also shown that a virus-only diet, which the team calls “virovory,” is enough to fuel the physiological growth and even population growth of an organism.

About virovore

- Viruses, often thought to be predators that feed and kill their hosts, are nutrition for another group of microscopic, often unicellular organisms, called protists.
- Scientists have now identified an actual species of protist that feasts on viruses — Halteria, a ciliate that was observed consuming viruses in samples of pond water.
- The breakthrough has been made by John DeLong and his team at the University of Nebraska-Lincoln in the United State.
- The laboratory experiments showed that these organisms can sustain themselves with viruses, consuming many and growing in size.
- It was only two years ago that scientists found viral genes in the genomes of marine protists, indicating that protists likely ingested viral matter. But direct consumption was not observed, until now.
- These virus-eating species of protists — which are their own kingdom on the tree of life and are not an animal, plant, or fungi — are now classified as virovores.
- Microbiologists noticed that both ciliate protists Halteria and Paramecium bursaria grew in quantity and multiplied while the quantity of viruses in the sample decreased, compared to control samples that were cleared of the virus.
- To confirm their theory that the organisms were feeding on viruses (more accurately, virions), the team stained the DNA of chloroviruses with a fluorescent dye and allowed protists like Paramecium caudatum and Euplotes to “graze” on the viruses, along with Halteria.
- They found that Halteria consumed 10,000 to 10,00,000 viruses per day, growing in size. The new Halteria cells also glowed, indicating that the dye in the virus particles had been ingested.
- Overall, with no other food sources, Halteria population increased by about 15 times in two days, while the level of chlorovirus which was used in the experiment dropped by 100 times. In control samples without the virus, Halteria did not grow.
- The experiments show that Halteria is the first known virovore, and that ciliate protists might play a major role in nature in allowing viruses to thrive.

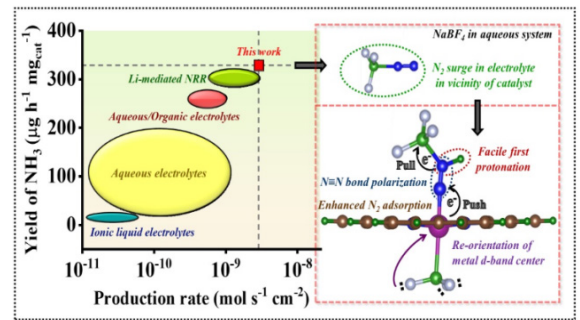
New aqueous electrolyte

Why in News

Recently, scientists from Institute of Nano Science and Technology (INST) have introduced a new electrolyte called (NaBF₄).

Important Points

- A new aqueous electrolyte that can help make electrochemical ammonia synthesis more efficient will be useful for industries producing green energy or hydrogen.
- The electrochemical ammonia synthesis is largely limited by the poor solubility of nitrogen (N₂) in the aqueous electrolyte environment as well as the competitive hydrogen evolution reaction.
- The obstacle faced was that reduction of N₂ has actually occurred in the aqueous medium. In an attempt to solve these issues, the “ambient” conditions are mostly overseen.
- Researchers mostly work on catalyst development, while electrolyte improvisation still remains in infancy.
- According to a recent report, 90.7 % of the research works related to : Nitrogen reduction reaction (NRR) have focused on the suitable catalyst development, while only 4.7 % have been devoted to work on the electrolytes.
- Scientists from INST Mohali have introduced a new electrolyte called (NaBF₄), which not only acts as an N₂-carrier in the medium but also works as a full-fledged “co-catalyst” along with active material transition metal-doped nanocarbon (MnN₄) to deliver high yield of ammonia (NH₃) at absolutely ambient experimental conditions.
- The high production rate of NH₃ approached industrial scale and exceeded almost all the standard catalysts in any other electrolyte medium.
- The source of NH₃ was thoroughly studied and confirmed to be chiefly from the electrochemical reduction of the purged N₂ gas (make it N₂ saturated electrolyte to convert N₂ to NH₃).
- This research is a novel approach to get through the long-standing issues about the solubility of N₂ in aqueous medium and achieve industrial scale production rate of ammonia by NRR at ambient condition.



The National Geospatial Policy, 2022

Why in News

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

Important Points

- After making waves with liberalisation in the field of geospatial data in 2021, the government notified the 2022 National Geospatial Policy on December 28, 2022, for implementation with immediate effect.
- The policy was earlier approved by the Union Cabinet.

What is the National Geospatial Policy?

- The new Geospatial Policy will replace the National Map Policy, 2005.
- It aims to strengthen the location-centric industry to support the information economy. It uses guidelines for acquiring and producing geospatial data and related services including maps, issued by the Department of Science and Technology (DST) in February 2021, as its foundation.
- The DST guidelines deregulated the geospatial sector and liberalised the acquisition, production, and access of data in the field.
- Building on it, the 2022 policy lays down a framework for the development of a geospatial ecosystem, including goals and strategies to achieve it.

What is geospatial data?

- Geospatial data are descriptions of events or occurrences with a location on or near the surface of the earth. This location can be static – relating to earthquakes, vegetation, etc., or dynamic – a person walking on the road, a package being tracked, etc.
- The location data obtained is usually combined with other characteristic attributes or recorded parameters to provide meaningful insights in the form of geospatial data.

The National Geospatial Policy lists the following targets to be achieved before 2035.

What is the government hoping to achieve with the policy?

- With the National Geospatial Policy, the government aims to employ geospatial technology and data towards achieving Sustainable Development Goals (SDGs).
- The policy emphasises the importance of locally available and locally relevant maps and geospatial data.
- It also aims to support innovation and creation in the field, “bridging the geospatial data divide”.
- It seeks to create long-term, sustainable geospatial information management through capacity development and education programmes.
- The government hopes that the policy will encourage open standards, open data and platforms.
- The policy is structured to contribute towards the democratisation of data — Survey of India (SoI) topographic data and other geospatial data produced using public funds would be treated as common goods and made easily available.
- While the SoI will play the lead role in maintaining high resolution/high spatial accuracy orthoimagery (geometrically corrected image to remove geographical and optical distortion), actual collection and collation of data will be “increasingly done with private sector participation”.
- Liberalisation in the field has the potential to support the government’s ease of doing business policy.
- The private sector is expected to predominantly cater to geospatial/location data-related needs and requirements of citizens.
- It will also play a key role in the creation and maintenance of geospatial and mapping infrastructures.

National Geospatial Policy, 2022

2025

1

Enable policy, legal framework supporting geospatial sector and democratisation of data for enhanced commercialisation

2

Redefine National Geodetic Framework using modern positioning technologies and online access

3

High accuracy Geoid for the country

4

Establish and strengthen an integrative interface for all digital data having location dimension collected or developed utilising public funds, for easy access, sharing, use and reuse

GNB1 Encephalopathy

Why in News

Researchers from India, Israel, US trying to develop drug to treat rare disease ‘GNB1 Encephalopathy’

Important Points

About GNB1 Encephalopathy

- With less than 100 documented cases worldwide, GNB1 Encephalopathy is a kind of brain disease or neurological disorder which affects individuals in the foetus stage.
- Delayed physical and mental development, intellectual disabilities, frequent epileptic seizures, are among the early symptoms of the disease and since genome sequencing is an expensive exercise, not many parents opt for it early on.
- Researchers at the Indian Institute of Technology (IIT), Madras, Tel Aviv University and Columbia University are studying a rare genetic brain disease called “GNB1 Encephalopathy” and trying to develop a drug to treat it effectively.
- According to a former PhD scholar at IIT Madras, a single nucleotide mutation in the GNB1 gene that makes one of the G-proteins, the “G 1 protein,” causes this disease.
- This mutation affects the patient since they are a foetus. Children born with GNB1 mutation experience mental and physical developmental delay, epilepsy (abnormal brain activity), movement problems.
- Every cell in the human body has a wide variety of signalling molecules and pathways that help in communicating with other cells and within itself. The major signalling mechanism used by cells is ‘G-Protein Coupled Receptor’ (GPCR) signalling.
- GPCR is a receptor that receives a signal (e.g. a hormone, light, neurotransmitter) from the outside of the cell and transduces it to the inside of the cell.
- GPCR is present in the cell membrane and has a G-protein ($\alpha\beta\gamma$) attached to it from inside the cell.
- G-proteins are the immediate downstream molecules that relay the signal received by the GPCR.

- These G-proteins are present in every cell, and any malfunction will cause disease.
- Mutations in GNB1 gene cause the neurological disorder (GNB1 Encephalopathy) characterised by general developmental delay, epileptiform activity in the electroencephalogram (EEG) and seizures of several types, muscle hypotonia or hypertonia, and additional variable symptoms, are seen in the patients.
- As the developmental issues start at the fetal stage, gene therapy is the most plausible option to alleviate the effects of the mutation. However, the development of this complicated procedure will take many years and great investment of funds.
- On the other hand, epilepsy can be treated using specific drugs to increase the patient's quality of life.
- To treat epilepsy, specific targets have to be identified.
- Most epilepsies are caused due to altered ion channel function. Ion channels are proteins that underlie the electrical activity of neurons and heart cells.
- It is also possible that a combination of already existing drugs help in a customised treatment line for the rare disease.
- The research was supported by Indo-Israel Binational grant offered by Israel Science Foundation (ISF) and India's University Grants Commission (UGC).
- The researchers pointed out that whole genome sequencing, the elucidation of the full genetic analysis of the baby, can be very helpful in early diagnosis of the disease.
- They have found that a potassium channel called G-protein gated Inwardly Rectifying K⁺ (GIRK) channel (present in brain, heart and endocrine glands) function is affected significantly.



New Alzheimer's drug lecanemab

Why in News

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

Important Points

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



World's first vaccine for honeybees

Why in News

The United States Department of Agriculture (USDA) has granted a conditional license for a vaccine for honeybees to curb American foulbrood (AFB), a fatal bacterial disease for the insect.

Important Points

- The first such vaccine, developed by biotechnology company Dalan Animal Health, gives hope of a new weapon against diseases that routinely ravage colonies relied upon for food pollination.
- The vaccine technology exposes queen bees to inactive (ie, “dead”) bacteria, which enables the larvae hatched in the hive to resist infection.
- The vaccine is mixed in queen candy — the primary food source for both the queen bees and the attendant bees living in cages.
- Worker bees consume the vaccine with the queen candy, which is then digested and transferred to the glands that produce the royal jelly. Worker bees then feed the royal jelly containing the vaccine to the queen bee.
- The queen digests the royal jelly and the vaccine is transferred to her ovaries. She is then released into the hive.
- The vaccine gets transferred to the developing eggs. The developing larvae get vaccinated and are more immune to infection as they hatch.
- The immune priming showed no negative impact on queen fitness in tests, the company claimed. Tests also showed no negative impact on honey.
- Vaccines for European foulbrood and Chalkbrood, a fungal disease, are in the pipeline by the company.

American foulbrood (AFB)

- AFB is caused by the spore-forming bacterium *Paenibacillus larvae*. Infected broods usually die at the pre-pupal or pupal stage.
- It is not a stress-related disease and can infect the strongest to the weakest colony in an apiary.
- Heavy infections can affect most of the brood, severely weakening the colony and eventually killing it.
- The disease cannot be cured, meaning that the destruction of infected colonies and hives or irradiation of infected material is the only way to manage AFB.
- The bacteria *Melissococcus plutonius* causes another similar disease, European foulbrood.
- However, the incidence of EFB is generally higher when the colony is under stress.
- Although AFB is not highly contagious, bacterial spores can easily be spread between hives and apiaries through beekeeping practices such as through the exchange of equipment and movement of infected combs. Adult bees are not affected by AFB but can spread spores within and between infected and clean hives through robbing and drifting.
- AFB spores can remain viable for over 50 years and are very resistant to freezing and high temperatures.



Snapdragon Satellite

Why in News

Apple iPhone 14's Emergency SOS via satellite will soon come to Android phones.

Important Points

Snapdragon Satellite

- Qualcomm at CES 2023 has announced Snapdragon Satellite- a satellite-based two-way capable messaging solution for premium smartphones.
- The company has partnered with Iridium and Garmin to introduce the satellite connectivity for two-way texting in remote or no internet connectivity areas.
- As per the company, Snapdragon Satellite feature will be available only on phones that run Qualcomm's Snapdragon 8 Gen 2 processor and its X70 Modem system.
- The feature is scheduled to roll out on next-generation smartphones, launched in select regions starting in the second half of 2023.

- The Snapdragon Satellite is powered by Snapdragon 5G Modem-RF Systems and is backed by Iridium's operational satellite constellation.
- The solution for smartphones utilizes Iridium's weather-resilient L-band spectrum for uplink and downlink.
- To send SMS via satellite, one will need a clear sky and time to set up a connection between one's phone and the satellite. Once the connection is set up, one can start sending SMS messages.
- One can send only 160-character messages using the Qualcomm's satellite connectivity feature. One can type his/her own messages and choose the recipient from your phone's contact book which isn't possible with iPhone 14. Apple allows to send limited responses to emergency services.
- Qualcomm, for now, will add the Satellite messaging feature only to its premium chips with plans to expand it to laptops, tablets, IoT and vehicles.

Limited to selected regions

- The emergency messaging service will reportedly be available only in selected regions starting in the second half of 2023. This is similar to Apple's recently launched Emergency SOS via Satellite feature, which is available in limited regions only.
- Currently, there is no information about which regions will have this feature.

Garmin collaborates with Qualcomm

- Tech giant Garmin, whose inReach Mini is a popular SOS device, has partnered with Qualcomm to enable the satellite emergency response services for smartphones.
- The company already offers multiple devices that offer emergency response services and respond to thousands of requests yearly.

Viologen

Why in News

IISER Pune have come up with a custom-designed unique molecular sponge-like material — macro/microporous ionic organic framework – iVOFm – to clean polluted water.

Important Points

About iVOFm

- It can swiftly clean polluted water by soaking up sinister contaminants.
- In general, commonly utilised sorbent materials often trap these pollutants through ion-exchange strategy to purify water but suffer from poor kinetics and specificity.
- To mitigate this issue, our group prepared a newly engineered material called viologen-unit grafted organic-framework (iVOFm).
- The material employs amalgamation of electrostatics driven ion-exchange combined with nanometer-sized macropores and specific binding sites for the targeted pollutants.

Features of this sponge

- The size and number of tunable macropores along with the strong electrostatic interaction of iVOFm can quickly remove various toxic pollutants from water.
- To develop this unique material, this team employed a make-and-break strategy to grow a charged porous organic polymer (POP) as a sponge-like infinite framework on silica nanoparticles that is used as a template.
- Following this, the silica nanoparticles were strategically removed to create ordered hierarchical interconnected macro/microporosity throughout the material.
- This material features inherent cationic nature and macroporosity to allow fast diffusion of pollutants.
- When tested for a wide array of water pollutants, it showed ultrafast capture of all the pollutants — both organic and inorganic — with over 93% removal in just 30 seconds.
- Among all the tested pollutants, the new material showed ultrafast removal of sulfadimethoxine antibiotic from water almost completely.
- Even in the presence of other co-existing anions such as nitrates, chloride, and bromide, the removal of sulfadimethoxine antibiotic was extremely high within a minute.
- The engineered material could remove sulfadimethoxine antibiotic with high efficiency when tested using different real water samples.
- The fast pollutant trapping capacity is attributed to faster diffusion of pollutants through the ordered interconnected presence of macropores in the material.

- They also found this material to be very selective toward toxic pollutants in presence of co-existing ions present in waste water even at low concentration.
- It can also be used several times to clean contaminated water just like a bath sponge can be utilised to tackle multiple water spills.
- This cationic compound is adaptable for sequestering various pollutants and is a possible solution to the water pollution problem.

Water pollutants

- Systematic studies have identified various organic (organic dyes, antibiotics, pesticides, etc.) as well as inorganic toxic pollutants such as iodides, oxo-pollutants like perrhenate that are carcinogenic in fresh water sources and can pose direct threat to humanity and living organisms.

New technique of corrosion

Why in News

A new method of deposition of Nickel alloy coatings on high-performance materials in engineering applications can replace environmentally toxic chrome coatings.

Important Points

Nickel alloy coatings

- Scientists at the Centre for Engineered Coatings at International Advanced Research Centre for Powder Metallurgy & New Materials (ARCI), an autonomous Research and Development Centre of the Department of Science and Technology (DST), Govt. of India, has developed a lab-scale process to deposit novel nanostructured Nickel alloy coatings.
- The process uses pulsed current electroplating, which is environmentally benign with high production capacity.
- In contrast to conventional, direct current used for chrome plating, the research at ARCI have used electric current in the form of pulses of duration of a few milliseconds for electroplating purpose.
- The process consists of an environmentally-friendly electrolyte consisting of nickel and tungsten ions that is the source of strengthening elemental tungsten (W) and nickel (Ni).
- The pulsed current is applied between the components to be coated, acting as cathode and non-consumable anode.
- The pulsed current effect was used for nano-crystalline coatings wherein high instantaneous current density for very small duration resulted in high rate of nucleation.
- Unlike in conventional direct current plating, the coatings were virtually porosity free, crack free with minimal hydrogen uptake.
- The use of pulsed current resulted in the nano-crystallization of nickel tungsten alloy coatings with high hardness and wear resistance. The coatings were extremely corrosion resistance and could withstand up to 700 hrs of salt spray.
- The coatings developed at ARCI can withstand temperatures up to 500°C without thermal softening and can improve the life of die components by at least two times than conventional chrome plating.
- They were successfully applied to die-casting components used in plastic bottling industry, wherein the temperatures at the die interface can be over 280°C.
- With numerous applications in automotive, defense, and aerospace for these coatings, the process know-how is ready for transfer as a replacement for conventional chrome plating.

Chrome coating

- Chromium coating is a technique that consists of electroplating a thin layer of the chemical element onto metal, to provide protection against wear and corrosion.
- This popular procedure utilises a chromium substance to cover different metal surfaces and is used for a wide range of creative and industrial functions.
- These include hydraulic cylinders and pistons, automotive and mechanical parts, press punches and tooling, mining and agriculture appliances, shafts and rotors, textiles and printing tools, alongside moulds and screws.
- They have been used in plastic bottling industry to improve the service life of die-casting components.
- However, chrome plating is a toxic process, and the stringent standard permissible exposure limit (PEL) for toxic hexavalent chromium and all its compounds has to be complied in all chrome plating industrial workplaces.

Duchenne Muscular Dystrophy

Why in News

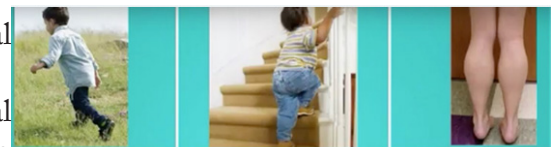
Researchers in India are working on developing an affordable treatment for a rare and incurable genetic disorder called Duchenne Muscular Dystrophy (DMD) with over 5 lakh cases in the country.

Important Points

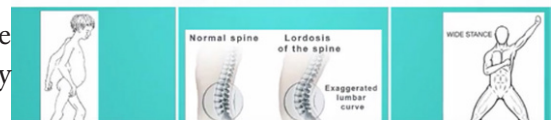
- The current therapeutic options available to treat DMD are minimal and highly expensive treatment with costs shooting up to Rs 2-3 crore per child a year and are mostly imported from abroad, accelerating dosing costs and putting them out of reach for most families.
- The Indian Institute of Technology (IIT), Jodhpur has established a research centre for DMD in collaboration with Dystrophy Annihilation Research Trust (DART), Bengaluru and the All India Institute of Medical Sciences (AIIMS) Jodhpur.
- The centre aims to develop affordable therapeutics for this rare and incurable genetic disorder.
- The researchers are working on affordable therapeutics for DMD and enhance the efficacy of Antisense Oligonucleotide (AON)-based therapeutics.
- According to researcher, the AON-based therapeutics' idea is to hide or mask specific exons (a segment of a DNA or RNA molecule containing information coding for a protein) in a gene sequence.
- "In DMD patients, one or more exons can be masked with specific molecules called AON or molecular patches. Due to these challenges, DMD patients need personalised medicine.
- Currently, the research team is also working on reduction of AON based therapeutic dose through new molecular tags.
- Until recently, boys with DMD usually did not survive much beyond their teen years. However, with advances in cardiac and respiratory care, life expectancy is increasing.

What is Duchenne Muscular Dystrophy?

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



DMD PROGRESSION



Symptoms:

- Enlargement of calves, a waddling gait, and lumbar lordosis (an inward curve of the spine)
- The current therapeutic options available to treat DMD are minimal and highly expensive treatment and are mostly imported from abroad.

Generative AI

Why in News

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

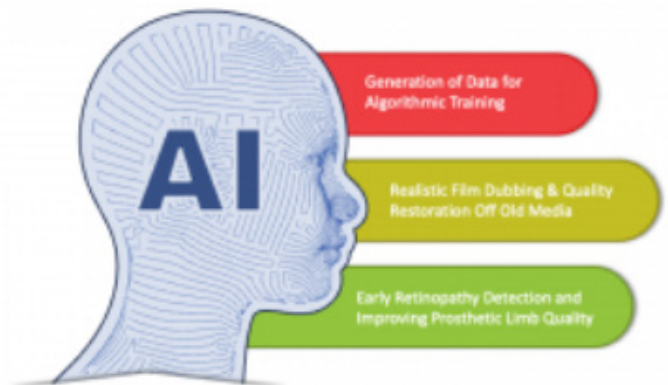
Important Points

What is generative AI?

- Generative AI is a cutting-edge technological advancement that utilises machine learning and artificial intelligence to create new forms of media, such as text, audio, video, and animation.
- Generative AI is not a new concept, and machine-learning techniques behind generative AI have evolved over the past decade.
- Deep learning and General Adversarial Network (GAN) approaches have typically been used, but the latest approach is transformers.
- A Generative Pretrained Transformer (GPT) is a type of large language model (LLM) that uses deep learning to generate human-like text.
- They are called “generative” because they can generate new text based on the input they receive, “pretrained” because they are trained on a large corpus of text data before being fine-tuned for specific tasks, and “transformers” because they use a transformer based neural network architecture to process input text and generate output text.
- Generative AI stretches beyond typical natural language processing tasks such as language translation, text summarization and text generation.
- OpenAI’s latest release ChatGPT, which caused a viral sensation and reached a million users in just Beyond the creative space, generative AI models hold transformative capabilities in complex sciences such as computer engineering.

Generative AI Statistics:

- By 2025, generative AI will account for 10% of all data produced.
- The forecasted AI annual growth rate between 2020 and 2027 is 33.2%.
- By 2030, AI will lead to an estimated \$15.7 trillion, or a 26% increase in global GDP.



- For example, Microsoft-owned GitHub Copilot, which is based on OpenAI’s Codex model, suggests code and assists developers in autocompleting their programming tasks.
- The system has been quoted as autocompleting up to 40% of developers’ code, considerably augmenting the workflow.
- Generative AI works by training a model on a large dataset and then using that model to generate new, previously unseen content that is similar to the training data.
- This can be done through techniques such as neural machine translation, image generation, and music generation.
- It has the potential to revolutionize many industries by automating the creation of content and enabling the generation of new ideas and concepts.
- Generative AI can craft sales, marketing, and brand messaging. Agencies can generate personalised social media posts, blogs, and marketing text and video copies by providing a text prompt to a Generative AI service, like ChatGPT.
- In addition, the service can quickly iterate different text by simply tweaking the prompt to effectively communicate with the audience.
- DALL.E, a generative image generation service, can also generate original imagery to align with the branding.
- Many startups are exploring services like DALL.E2, Bing Image Create, Stable Diffusion, and MidJourney to create their brand logo and to align the same with Generative AI text messaging. Instoried is using Generative AI for marketers to become better copywriters.
- However, it also raises ethical concerns about the potential for biased or inaccurate content to be generated and disseminated.

The James Webb Space Telescope has discovered its first new exoplanet

Why in News

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

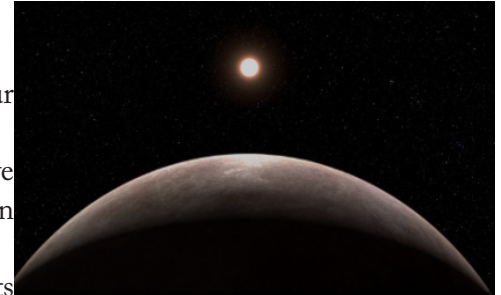
Important Points

About the new exoplanet (LHS 475 b)

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

What are exoplanets?

- Exoplanets are planets that orbit other stars and are beyond our solar system.
- According to NASA, to date, more than 5,000 exoplanets have been discovered. Scientists believe that there are more planets than stars as each star has at least one planet orbiting it.
- Exoplanets come in a host of different sizes. They can be gas giants bigger than Jupiter or as small and rocky as Earth. They are also known to have different kinds of temperatures — boiling hot to freezing cold.
- Studying exoplanets not only broadens our understanding of other solar systems but also helps us piece together information about our own planetary system and origin.
- In a bid to understand the characteristics of an exoplanet, researchers look for its mass and diameter along with determining if it is solid or gaseous or even has water vapour in the atmosphere.
- Another important element of the study is finding out the distance between an exoplanet and its host star.
- This helps scientists determine if a discovered world is habitable or not. If an exoplanet is too close to the star, it might be too hot to sustain liquid water.
- If it's too far, it might only have frozen water. When a planet is at a distance that enables it to have liquid water, it is said to be in the “Goldilocks zone”.



How are exoplanets discovered?

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

Pantranscriptome

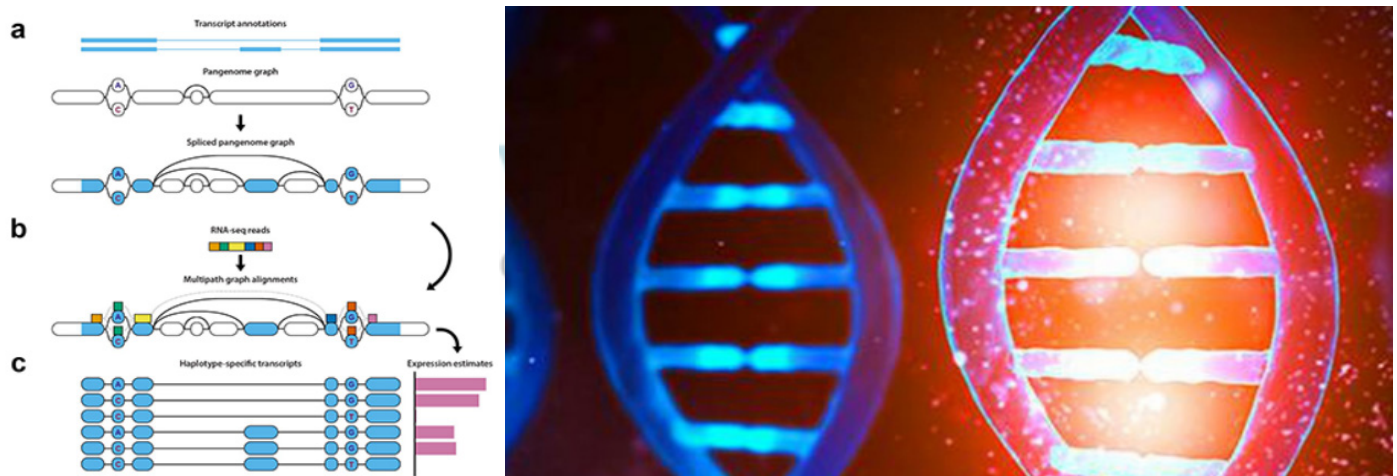
Why in News

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

Important Points

- Deciphering how and which of an individual's genes switch on and off involves mapping their RNA landscape (the messengers necessary to translate gene signals to proteins) to a standard reference.
- However, such reference templates are frequently themselves short on information and impede understanding of gene function.
- RNA's most commonly recognized function is to translate DNA into proteins, but scientists now understand that the vast majority of RNA does not make proteins, but instead can play roles such as influencing cell structure or regulating genes.

- The entire RNA landscape is known collectively as the transcriptome, and mapping this allows researchers to better understand an individual's gene expression.
- The pantranscriptome-concept builds on the emerging concept of “pangenomics” in the genomics field.
- Typically, when evaluating an individual's genomic data for variation, scientists compare the individual's genome to that of a reference made up of a single, linear strand of DNA bases.
- Using a pangenome allows researchers to compare an individual's genome to that of a genetically diverse cohort of reference sequences all at once, sourced from individuals representing a diversity of biogeographic ancestry.
- This gives the scientists more points of comparison for which to better understand an individual's genomic variation.
- Mapping RNA sequencing data to understand gene expression can be difficult because the RNA sequences are spliced by cellular mechanisms, meaning one set of RNA data can come from non-connected areas of the genome, making it challenging to correctly align them to a reference.
- These splicing sites are not uniform across the human population, but vary between individuals.
- It is also difficult to know which haplotype the RNA comes from — whether the group of genes comes specifically from the set of chromosomes inherited from the individual's mother, or the set inherited from the father.
- But with the new pipeline of open-source tools, the researchers can take the spliced segments of an individual's RNA, map where they align on a pangenome, identify which haplotype the data belongs to, and analyse gene expression.



GMRT in Pune help to detect a radio signal from atomic hydrogen

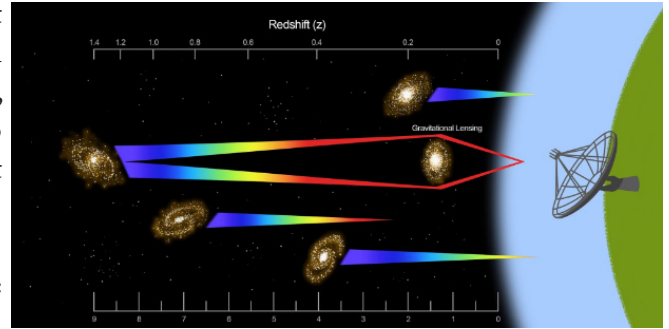
Why in News

Astronomers from Canada and India have used data from the Giant Metrewave Radio Telescope (GMRT) in Pune to detect a radio signal originating from atomic hydrogen in an extremely distant galaxy.

Important Points

- The astronomical distance over which such a signal has been picked up is the largest so far by a large margin. This is also the first confirmed detection of strong lensing of 21 cm emission from a galaxy.
- Atomic hydrogen is the basic fuel required for star formation in a galaxy.
- When hot ionised gas from the surrounding medium of a galaxy falls onto the galaxy, the gas cools and forms atomic hydrogen, which then becomes molecular hydrogen, and eventually leads to the formation of stars.
- Therefore, understanding the evolution of galaxies over cosmic time requires tracing the evolution of neutral gas at different cosmological epochs.
- Atomic hydrogen emits radio waves of 21 cm wavelength, which can be detected using low frequency radio telescopes like the GMRT.
- Thus, 21 cm emission is a direct tracer of the atomic gas content in both nearby and distant galaxies.
- However, this radio signal is extremely weak and it is nearly impossible to detect the emission from a distant galaxy using current telescopes due to their limited sensitivity.

- Until now, the most distant galaxy detected using 21 cm emission was at redshift $z=0.376$, which corresponds to a look-back time – the time elapsed between detecting the signal and its original emission – of 4.1 billion years (Redshift represents the change in wavelength of the signal depending on the object's location and movement; a greater value of z indicates a farther object)
- Using GMRT data, researchers at the Department of Physics and Trottier Space Institute of McGill University, and Nirupam Roy, Associate Professor, Department of Physics, IISc, have detected a radio signal from atomic hydrogen in a distant galaxy at redshift $z=1.29$.
- Due to the immense distance to the galaxy, the 21 cm emission line had redshifted to 48 cm by the time the signal travelled from the source to the telescope.
- The signal detected by the team was emitted from this galaxy when the universe was only 4.9 billion years old; in other words, the look-back time for this source is 8.8 billion years.
- This detection was made possible by a phenomenon called gravitational lensing, in which the light emitted by the source is bent due to the presence of another massive body, such as an early type elliptical galaxy, between the target galaxy and the observer, effectively resulting in the “magnification” of the signal.
- The team also observed that the atomic hydrogen mass of this particular galaxy is almost twice as high as its stellar mass.
- These results demonstrate the feasibility of observing atomic gas from galaxies at cosmological distances in similar lensed systems with a modest amount of observing time.
- It also opens up exciting new possibilities for probing the cosmic evolution of neutral gas with existing and upcoming low-frequency radio telescopes in the near future.
- Here, ‘Redshift’ refers to the change in wavelength of the signal depending on the object's location and movement. Furthermore, the greater the value of z , the farther the object is.
- GMRT is a low-frequency radio telescope that helps investigate various radio astrophysical problems ranging from nearby solar systems to the edge of the observable universe.



Technology for Biosensing system

Why in News

The Secretary, Ministry of Electronics & IT (MeitY) has launched the Technology for Biosensing system for the detection of Endocrine Disrupting Chemicals in aquatic ecosystems (MEAN) developed under MeitY supported projects.

Important Points

About the technology

- The Centre for Development of Advanced Computing (C-DAC), Kolkata in collaboration with ICAR-CI-FRI, Baraackpore under the ‘National programme on Electronics and ICT applications in Agriculture and Environment (AgriEnIcs)’ has developed a biosensing system for detection of Endocrine Disrupting Chemicals (EDC) in aquatic ecosystems, for qualitative and quantitative analysis of EDC content in water bodies.
- The Biosensing based EDC detection system (MEAN), was also transferred to the selected industry Arogyam Medisoft Solution Private Limited for further commercialization of the same technology for deployment at different locations of North-East.
- The transfer of technology (ToT) was done at MeitY, New Delhi.

Technology for Air Quality Monitoring System (AI-AQMS v1.0)

- The Secretary, MeitY, has also launched the Technology for Air Quality Monitoring System (AI-AQMS v1.0) developed under MeitY supported projects.
- The Centre for Development of Advanced Computing (C-DAC), Kolkata in collaboration with TeXMIN, ISM, Dhanbad under the ‘National programme on Electronics and ICT applications in Agriculture and Environment (AgriEnIcs)’ has developed a outdoor air quality monitoring station to monitor environmental pollutants which includes parameters like PM 1.0, PM 2.5, PM 10.0, SO₂, NO₂, CO, O₂, ambient temperature, relative humidity etc., for continuous air quality analysis of the environment.
- The AI-AQMS v1.0, was also transferred to the selected industry J.M. EnviroLab Private Limited for further commercialization of the same technology for deployment at different mine and cement industries.

Purple Fest

Why in News

India's first-of-its-kind inclusivity, 'Purple Fest: Celebrating Diversity' began in a glorious ceremony in Goa.

Important Points

- The festival aims to show to all how to bring inclusivity in our society, and how to support one another.
- The Department of Empowerment of Persons with Disabilities, in collaboration with the Office of the Chief Commissioner for Persons with Disabilities (CCPD), hosted this festival.
- It covered best practices in the field of disability, with an emphasis on enhancing accessibility by addressing implementation challenges of various schemes and programmes for people with disabilities, as well as accessibility innovations and action plans.
- It also included the Purple Think Tank, a series of speeches and panel discussions on themes such as inclusive education and employment for people with disabilities.
- The Union Minister for Social Justice & Empowerment also inaugurated a two day sensitization workshop on "Issues relating to Empowerment of persons with Disabilities" in association with the Purple Festival in Goa.
- The objective of the workshop was to sensitize the Government, Non-Govt, Corporate Sector about their role to create an inclusive society and also to have a co-ordinated approach towards the empowerment of Divyangjan.
- The two day workshop focuses on improving accessibility, implementation-related issues of various schemes and programmes for Persons with Disabilities, innovations and action plans in the field of accessibility. Representatives of States/UTs Government and some of the eminent NGOs participated in the workshop.
- Observing that such festivities that celebrate the spirit of inclusivity are essential for boosting the confidence of persons with disabilities as well as sensitizing society towards their needs and issues.
- Rights of Persons with Disabilities Act was introduced in 2016 to ensure that persons with disabilities are empowered.



Draft amendments proposed to regulate online gaming

Why in News

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

Important Points

Amendments

- The draft has been prepared to ensure that online games should be offered in conformity with Indian laws and that the users of such games be safeguarded against potential harm.
- In December 2022, the Government through a gazette notification, notified change in Allocation of Business rules designating Meity as the nodal ministry for online gaming related concerns.
- Government aims for the online gaming ecosystem to expand & grow and be an important catalyst to India's One trillion dollar Digital economy goal by 2025-26.
- The draft has proposed a self-regulatory mechanism which, in future, may also regulate the content of online gaming and ensure that the games do not have violent, addictive or sexual content.
- As of now, the age gating is 18 years and the Government would like to keep it that way and see if the present framework works to expand the innovation ecosystem around online gaming while keeping it safe & trusted for gamers.

- The Ministry has said that around 40 to 45 percent of the gamers in India are women, and therefore it was all more important to keep the gaming ecosystem safe.
- The draft rules have strict provisions against betting and wagering. The online games that allow wagering on the outcome are effectively a no-go area.
- The proposals are aimed at safeguarding the interests of users by introducing set procedures and norms for verification and user engagement.
- More importantly, the draft proposal defines what constitutes an ‘online game’. It is “a game that is offered on the internet and is accessible by a user through a computer resource if he makes a deposit with the expectation of earning winnings”.
- ‘Winning’ constitutes any prize, in cash or kind, intended to be given to the participant “on the performance of the user and in accordance with the rules of such online game”.
- This addresses the discourse in the sector about the definitions of a ‘game of skill’ and ‘game of chance’.
- The term ‘game of skill’ had been used in the Public Gambling Act (1867) but had not been defined.
- The proposal endeavours to provide for greater transparency. The game operators would have to verify users on the platform and provide them with the terms of services.
- For the monetary aspect of it, operators would have to inform the user about the policy related to withdrawal or refund of their deposit, measures taken for its protection, the manner and distribution of winnings and the fees and other charges to be paid by the user.
- They would also have to be informed about the risk of potential financial loss and addiction associated with the game.
- The self-regulating bodies’ framework must also include safeguards to protect children.
- Addiction is to be combated using repeated warning messages should the user exceed a reasonable duration while playing a certain game.
- At the time of onboarding a user, the operator would be expected to verify the identity of the user.
- The procedure for the same must be informed in advance to the user being onboarded.
- It also puts forth measures for users who register their devices from India or use their services from India, to voluntarily verify their accounts.
- They would be provided with a “demonstrable and visible” mark of identification.
- The information gathered for verification cannot be used for any other purpose without the user’s content.

Rules for platforms

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



Rules for the self-regulating bodies

- MeitY is entrusted with the responsibility of recognising and if required, un-recognising all self-regulated bodies under the proposed framework.
- The applications of the desirous candidates would be examined on criterions including the number of companies who are its members, its track record in promoting responsible online gaming, the absence of conflict of interest and suitability of its board of directors.
- The latter must be independent and eminent people in the space with relevant expertise in public policy, public administration, psychology, medicine or consumer education, online gaming or any other relevant field.

- The self-regulatory bodies would also be assessed for their capacity in terms of deployment of technology, expertise and other relevant resources to ensure compliance from members.
- They are required to examine a game in light of the member's adherence to due diligence norms and relevant laws.

Regulation of online gaming in other countries

- China has placed strict limits on the time young people may spend playing online games.
- Online gaming in the country is now only available to people younger than 18 from 8 p.m. to 9 p.m. on Fridays, Saturdays, Sundays and public holidays.
- Before an online game can be distributed in China, it must obtain approval and an International Standard Book Number (ISBN) from China's National Press and Publication Administration (NPPA).
- In the U.S., Internet casino gaming remains illegal in every state that doesn't explicitly legalise the games.
- Germany's "Youth Protection" laws aimed at violent games pushed developers to replace realistic red blood with a green version, for example, and Australia has sought to ban games for including depictions of everything from assault to marijuana use.

Obscenity laws in India

Why in News

Urfi Javed To Join Police Inquiry Into Public Nudity Complaint By BJP Leader.

Important Points

- Mumbai Police has called TV actress and social media influencer Urfi Javed for an inquiry in connection with a complaint lodged against her by Bharatiya Janata Party leader Chitra Kishor Wagh for "indulging in nudity publicly".

What are the obscenity laws in India?

- Under the Indian Penal Code (IPC), Sections 292, 293 and 294 deal with the offence of obscenity.
- One can find a vague definition of what constitutes obscenity in Section 292, which says that any content shall be deemed to be obscene if it is lascivious or appeals to the prurient interest, or if its effect tends to deprave and corrupt persons likely to read, see or hear the content.
- This section prohibits the sale or publication of any obscene pamphlet, book, paper, painting, and other such materials.
- Meanwhile, Section 293 criminalises the sale or distribution of obscene objects to anyone who is under the age of 20, or an attempt to do so.
- Although it is a bailable offence, the maximum punishment for the first conviction is three years of imprisonment and a fine up to Rs 2,000, and for the second conviction seven years with a fine up to Rs 5,000.
- Section 294 prohibits obscene acts and songs in public spaces. The maximum punishment for the person convicted under this charge is three-month jail and a fine.
- With the advent of the digital age, laws were made to criminalise obscene conduct on the internet also.
- Section 67 of the Information Technology Act says that anyone who publishes or transmits obscene material in electronic form can be punished.
- An aggrieved person is anyone who believes that the object on display, sold, or shared has the potential to corrupt the minds of those who come into contact with it can file a complaint.
- It is not necessary for the person to have come into contact with the obscene object.
- Even section 20 of the Indian Post Office Act of 1898 prohibits the transmission by post of anything indecent, etc.

Judiciary's view on obscene

- With no clear definition in the laws, what can be considered as obscene as per the Indian courts has changed and evolved over the years.
- Until 2014, the judiciary used the Hicklin test to determine if something is obscene or not.
- The Hicklin Test was established in English Law after the case of Regina vs Hicklin (1868). According to it, a work can be considered obscene if any portion of it is found to "deprave and corrupt those whose minds are open to such influences".

- The test was most famously used by the Supreme Court to ban DH Lawrence's Lady Chatterley's Lover in the case of Ranjit D Udeshi vs State Of Maharashtra (1964).
- However, in 2014, the apex court did away with the Hicklin Test while hearing the case of Aveek Sarkar & Anr vs State Of West Bengal and Anr, which was regarding the publication of a semi-nude picture of Boris Becker and his fiancée.
- In its judgement, the court said while judging as to whether a particular photograph, an article or book is obscene, regard must be had to the contemporary mores and national standards and not the standard of a group of susceptible or sensitive persons.
- It added that the photograph must be "taken as a whole" and seen with the context of what it wants to convey.

Other notable cases of "obscenity"

- In 2022, after Bollywood actor Ranveer Singh posted pictures of his nude photoshoot for the New York-based Paper magazine on social media, police booked him under Sections 292, 293 and 509 of the IPC and Section 67A of the IT Act.
- Before Singh, model and actor Milind Soman was booked by the Goa Police in November 2021 for uploading a photograph of himself running nude on a beach in the state.

AVGC task force Report

Why in News

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

Important Points

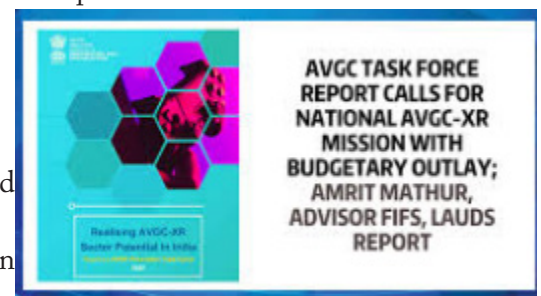
- AVGC Task Force was constituted under the Chairmanship of Secretary, Ministry of I & B, Shri Apurva Chandra, to help realize the full potential of the AVGC sector in India, with key stakeholders from the Industry and the Government.
- Secretaries of associated union ministries viz. MSDE, Department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

Key recommendation of the task force

The main recommendations of the Task Force categorized broadly under 4 categories are as under:

Domestic Industry Development for Global Access:

- A National AVGC-XR Mission with a budget outlay to be created for integrated promotion & growth of the AVGC sector.
- Launch of a 'Create in India' campaign with exclusive focus on content creation, In India, For India & For World!
- With a goal to make India the global hub for AVGC, institute an International AVGC Platform, along with a Gaming Expo) with focus on FDI, Co-production treaties and Innovation.
- Establish a National Centre of Excellence (COE) for the AVGC sector to become an international reference point across Skilling, Education, Industry Development and Research & Innovation for the AVGC sector.



Developing Talent ecosystem to realize Demographic Dividends:

- Leverage NEP to develop creative thinking with dedicated AVGC course content at school levels, to build foundational skills and to create awareness about AVGC as a career choice.
- Launch AVGC focused UG/ PG courses with standard curriculum and globally recognized degrees. Standardize admission tests for AVGC related courses (viz, MECAT by MESC).
- With an eye on the demand of 20 Lakh skilled professionals in AVGC sector in this decade, augment skilling initiatives for AVGC sector under MESC.
- Enhance Industry participation to ensure employment opportunities and absorption for students from non-metro cities and NE states.
- Establish AVGC Accelerators and Innovation hubs in academic institutions, on lines of Atal Tinkering Labs.

Enhancing Technology & Financial Viability for Indian AVGC Industry:

- Democratize AVGC technologies by promoting subscription-based pricing models for MSME, Start-Ups and institutions.
- Made in India for AVGC technologies through incentive schemes for R&D and IP creation. Evaluate PLI scheme to incentivize AVGC hardware manufacturers.
- Enhanced Ease of Doing Business in AVGC sector i.e tax benefits, import duties, curbing piracy, etc.
- Leverage Start-Up India to provide technical, financial and market access assistance to AVGC entrepreneurs to promote culture of R&D and local IP Creation.

Raising India's soft power through an Inclusive growth:

- Establish a dedicated Production Fund for domestic content creation from across India to promote Indian culture & heritage globally. Evaluate Reservation for high-quality indigenous content by broadcasters.
- For an Inclusive India, target skilling and industry outreach for youth in Tier 2 & 3 towns and villages in India. Establish Special incentives for women entrepreneurs in AVGC sector.
- Promote local Children's channels for raising awareness on rich culture and history of India among children and youth
- Establish framework to ensure Child Rights Protection in the digital world

Lokur Committee

Why in News

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

Important Points

- In response to a query under the Right to Information Act, 2005, the Office of the RGI said, "For criteria, report of the Advisory Committee on the revision of the lists of Scheduled Castes and Scheduled Tribes (Lokur Committee 1965) is consulted."
- This comes even as the government, until December, 2017, insisted in Parliament that it was considering a proposal to change the criteria for scheduling of new communities as STs based on the report of an internal task force, which had called these criteria "obsolete", "condescending", "dogmatic", and "rigid".

The criteria set out by the Lokur Committee for defining a community as a tribe are:

- Indications of primitive traits.
- Distinctive culture.
- Geographical isolation.
- Shyness of contact with the community at large.
- Backwardness.
- The Office of the RGI's nod is mandatory for the inclusion of any community in ST lists, as per the procedure for scheduling tribes.



Government task force on Scheduling of Tribes

- The government task force on Scheduling of Tribes constituted under the leadership of then Tribal Affairs Secretary, Hrusikesh Panda in February 2014, had concluded that these criteria (Lokur Committee) may have become obsolete considering the process of transition and acculturation.
- Further, it noted that terms like primitive and the requirement of primitivity to be a characteristic of Scheduled Tribe indicates a condescending attitude by outsiders.
- The Task Force had recommended changes to the criteria in May 2014 and based on this, the Tribal Affairs Ministry had in June 2014 prepared a draft Cabinet note to overhaul the criteria and procedure for scheduling of new communities as STs.

The new criteria under the government's consideration included:

- Socio-economic, including educational, backwardness, vis-a-vis, the rest of the population of the State.
- Historical geographical isolation which may or may not exist today.
- Distinct language/dialect.
- Presence of a core culture relating to life-cycle, marriage, songs, dance, paintings, folklore.
- Endogamy, or in case of exogamy, marital relationship primarily with other STs (This criterion is for scheduling of a community as ST and not for determining ST status of an individual).

Hindu lifestyle not ineligible

- The draft Cabinet also proposed, "Communities which have adopted a 'Hindu' way of life will not be ineligible merely on this ground."
- It further recommended considering the population of the new community in relation to the existing ST population of the State, adding that all these criteria had to be looked at holistically and none should take precedence over another.
- Now, with the Office of the RGI saying it continues to follow the criteria set out by the Lokur Committee in 1965, the fate of the proposal to change the criteria hangs in the balance.
- The Office of the RGI has said that it relies on census publications, which go back to 1891, along with materials provided by the nodal Union ministry and State governments, and then decides whether a community can be categorised as ST based on the Lokur Committee criteria.
- The draft Cabinet note also proposed that communities which have adopted a 'Hindu' way of life will not be ineligible merely on this ground.
- It further recommended considering the population of the new community in relation to the existing ST population of the State, adding that all these criteria had to be looked at holistically and none should take precedence over another.
- For instance, it noted that the 1891 census described tribes as people with a "tribal religion"; the 1901 and 1911 censuses described them as "tribal animists"; in 1921, they were called "hill and forest tribes"; in 1931, they were documented as "primitive tribes"; and were classified as "tribes" in 1941, before moving to the Constitutional term of "Scheduled Tribes" in 1951.
- The same task force had also recommended changes to the "cumbersome" procedure for scheduling of tribes followed since 1999, which it said along with the "obsolete" criteria was hindering over 40 communities from being included in ST lists across States.

Hemo-halt bandage

Why in News

The Hemo-halt bandage, containing chitosan (a natural polymer that halts bleeding) and agonist (a substance that improves clotting) nanoparticles can rapidly minimize blood loss from wounds.

Important Points

About the bandage

- The Hemo-halt bandage can reduce blood loss before treatment, save lives, and reduce disabilities on the battlefield.
- It can also contribute to the reduction in hospitalization costs.
- Worldwide, uncontrolled hemorrhage is the leading cause of traumatic death during accidents or injuries among the military and civilian populations.

- Severe bleeding triggers trauma due to shock, hypothermia, coagulopathy, tissue damage, and organ failure that often causes mortality.
- Therefore, efforts for early hemorrhage control are important to prevent disability or death during severe blood loss.
- Though critical care guidelines recommend topical hemostatic agents in the form of pads, patches, bandages, or gel applications for early control of bleeding, most of these are inadequate in halting heavy blood loss.
- Conventional physical hemostatic agents like bone wax and gelatin foam, biological agents such as bovine thrombin, and fibrin sealants, and synthetic agents including cyanoacrylates and glutaraldehyde, cause inflammation, viral infection, and tissue toxicity.
- Considering these limitations, the development of effective and safe dressing for hemorrhage control occupies high significance for both civilian and battlefield populations.
- MACS-Agharkar Research Institute, an autonomous institute of the Department of Science and Technology (DST), has developed a hemostatic bandage that incorporates chitosan (a natural glucosamine-containing polymer) and of agonist (a substance that improves clotting) nanoparticles for rapid hemostasis.
- Chitosan, which can control bleeding due to its cationic nature and hydrogel-forming ability that leads to the concentration of erythrocytes and platelets in the injury site.
- Commercial chitosan preparations like Celox, a lightweight chitosan foam powder produced by bubbling, and Hem-Con, chitosan-coated bandages, are approved by FDA and are in use for hemorrhage control by the US army.
- However, these wound dressings show variable performances due to a lack of stabilization of blood clots, mechanical strength, lack of porosity, and a tendency for adherence to wound surface.
- In the newly developed homeostatic bandage, the synergistic effects of combining chitosan and agonist nanoparticles resulted in the highly efficient blood clotting ability.
- The hemostatic gauze has the added advantage of the ease of removal from the injury site. The
- The indigenous bandage will be an import substitute to foreign brands like Celox, Hem-Con, Chitoclot, etc., promoting the make-in-India effort.
- Hemostatic soft gels are also being developed that can be applied to soft tissues and organs.



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

Why in News

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

Important Points

- ASER is a household survey conducted across 616 rural districts and covers 6.9 lakh children in the age group of 3 to 16 years to record their schooling status and assess their basic reading and arithmetic skills.
- The report is being brought out after four years and records the impact of school closures in 2020 and 2021, as well as the return to school of children in 2022.
- According to the report, as schools reopened after nearly two years of closure due to COVID-19, student enrolments increased to more than pre-pandemic levels but the learning gap widened for foundational skills in reading and arithmetic, reversing several years of improvement.
- The national-level study shows that despite school closures during the pandemic, the overall enrolment figures, which have been above 95% for the past 15 years for the 6 to 14 years age group, increased from 97.2% in 2018 to 98.4% in 2022.
- The proportion of children in this (3-16 years) age group who are not currently enrolled also dropped to its lowest level ever to 1.6% from 2.8% in 2018, when the last full-scale ASER survey was conducted.
- Government schools have seen a sharp increase in children enrolled from 65.6% in 2018 to 72.9% in 2022, reversing another trend of a steady decrease in student enrolments seen since 2006, when it was at 73.4%.
- Despite the enthusiasm seen among parents and students towards schools, children's basic literacy levels have taken a big hit, with their reading ability as compared to numeracy skills worsening much more sharply and dropping to pre-2012 levels.

- The percentage of children in Class 3 in government or private schools who were able to read at the level of Class 2 dropped from 27.3% in 2018 to 20.5% in 2022. This decline is visible in every State, and for children in both government and private schools.
- States showing a decline of more than 10 percentage points from 2018 levels include those that had higher reading levels in 2018, such as Kerala (from 52.1% in 2018 to 38.7% in 2022), Himachal Pradesh (from 47.7% to 28.4%), and Haryana (from 46.4% to 31.5%).
- Large drops are also visible in Andhra Pradesh (from 22.6% to 10.3%) and Telangana (from 18.1% to 5.2%).
- Nationally, the proportion of children enrolled in Class 5 in government or private schools who can at least read a Class 2-level text fell from 50.5% in 2018 to 42.8% in 2022.
- States showing a decrease of 15 percentage points or more include Andhra Pradesh, Gujarat, and Himachal Pradesh.
- The drops in basic reading ability are smaller for Class 8 students, where 69.6% of children enrolled in government or private schools who could read at least basic text in 2022 falling from 73% in 2018.
- The ASER reading test assesses whether a child can read letters, words, a simple paragraph at Class 1 level of difficulty, or a story at Class 2 level of difficulty.
- Class 3 students who were able to do at least subtract dropped in 2022. While Jammu & Kashmir, Uttar Pradesh and Madhya Pradesh maintained or improved slightly over 2018 levels, steep drops of more than 10 percentage points are visible in Tamil Nadu.
- The proportion of children in Class 5 across India who can carry out division has also fallen slightly in 2022.
- The performance of Class 8 students in basic arithmetic is more varied. Nationally, the proportion of children who can do division has increased slightly in 2022.
- This increase is driven by improved outcomes among girls as well as among children enrolled in government schools, whereas boys and children enrolled in private schools show a decline over 2018 levels.
- Children in Class 8 in government schools did significantly better in 2022 than in 2018 in Uttar Pradesh and Chhattisgarh, but were significantly worse off in Punjab.
- While families withdrew students from private schools to save money spent on tuition fees, they also invested in private tuition classes, which increased as the proportion of such students rose further from in 2022 in both private and government schools.
- This may also be the reason why learning gaps are sharper in reading because students typically choose to study maths and science in tuition classes.
- The report also lays to rest apprehensions about the pandemic forcing families to withdraw girls from schools and force them into early marriages.
- It finds that the percentage of girls in the age group of 11-14 years who were out of school declined to 2% from 4.1%.
- The decrease in the proportion of girls not enrolled in school is even sharper among older girls in the 15-16 years age group, which stood at 7.9% in 2022 as compared with 13.5% in 2018.



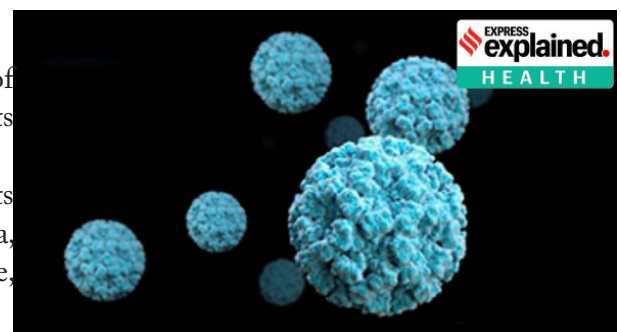
Norovirus

Why in News

Norovirus cases detected in Kerala

Important Points

- The Kerala Health Department confirmed two cases of the gastrointestinal infection norovirus in class 1 students in Ernakulam district.
- The two samples were tested after 62 persons — students and their parents — developed symptoms such as diarrhoea, abdominal pain, vomiting, nausea, a high temperature, headache, and body aches.



What is norovirus and how common are infections?

- Norovirus is not new; it has been circulating among humans for over 50 years and is thought to be one of the primary causes of gastroenteritis.

- The virus is estimated to kill 200,000 persons globally every year, with most deaths occurring among those below the age of five years and those over the age of 65 years.
- The virus is capable of surviving low temperatures, and outbreaks tend to be more common during the winter and in colder countries — that is why it is sometimes referred to as “winter vomiting disease”.
- The reported cases of norovirus had seen a decline in the United Kingdom during the pandemic, likely due to lax surveillance, but numbers have since picked up.
- A 48% higher incidence of reported cases than expected was reported by the UK Health Security Agency (UKHSA) in 2022.
- A 2022 study published in the peer reviewed journal *Viruses* says that norovirus infections are more frequently detected in high income countries, with almost 40% cases being seen in long-term care facilities.
- In contrast, the cases in India have mostly been detected in settings like schools and hostels, where people share food.

And what is the incidence of infection in India?

- Cases of norovirus are not as common in India as in many other places — at the same time, the recent cases in Kerala are by no means unique or one-offs.
- The infection has been reported in previous years as well, mainly from Southern India, and especially from Kerala.
- A 2016 study by Christian Medical College-Vellore that followed a birth cohort of 373 for three years, detected 1,856 diarrhoeal episodes and 147 vomiting episodes.
- The study said that norovirus was detected in 11.2% of the diarrhoeal episodes and 20.4% of the vomiting episodes.
- A 2021 study from Hyderabad reported that norovirus was detected in 10.3% samples of children who came in with acute gastroenteritis.

But why is the infection so common in Kerala, especially?

- It probably has more to do with Kerala's strengths than any weaknesses.
- The state has a strong public health system that is capable of picking up clusters of infection and getting them tested quickly.

Can norovirus infection cause a large-scale outbreak?

- No. Even though more cases of norovirus are being detected, experts say that this is unlikely to lead to a large-scale outbreak.
- The norovirus cases are sporadic and found in small clusters in schools or hostels where people consume the same foods. The spread of the infection is also self-limiting.
- It is an individual problem, not a public health one.

What are the symptoms and how to prevent its spread?

- Norovirus leads to diarrhoea, vomiting, nausea, and abdominal pain.
- Being a diarrhoeal disease, it can lead to dehydration, so drinking plenty of fluids is recommended.
- The infection can be transmitted through foods contaminated with the virus, touching surfaces that are contaminated with the virus and then touching the mouth, and being in direct contact with someone with the infection like taking care of them and sharing foods and utensils with them.
- Good hand hygiene is the best way to prevent infection.
- Wash your hands with soap and water for 20 seconds.
- Hands sanitisers are thought to not work too well against norovirus.
- As the infection can be transmitted by foods, it is suggested that a sick person not prepare food for others.
- All food items should be carefully washed and cooked at high temperatures.
- The norovirus can survive temperatures as high as 60 degrees Celsius.
- Areas where a sick person has vomited or had diarrhoea should be cleaned using disinfectants or bleach.

Chapter- 7

INTERNATIONAL RELATION

APPU

Why in News

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

Important Points

- India will take over the chair of the intergovernmental organization following the successful elections held during the 13th APPU Congress held in Bangkok.
- Dr. Vinaya Prakash Singh, erstwhile Member (Personnel), Postal Services Board will lead India at the significant forum. Dr. Singh will assume the charge of Secretary General of the Union during India's four year tenure there.
- It is pertinent to note that India, for the first time, is leading an international organisation in the postal sector.

About the Asian Pacific Postal Union (APPU)

- Asian Pacific Postal Union (APPU) is an intergovernmental organization of 32-member countries of the Asian-Pacific region.
- APPU is the only Restricted Union of the Universal Postal Union (UPU) in the region, which is a specialized agency of the United Nations.
- The goal of APPU is to extend, facilitate and improve postal relations between member countries and to promote cooperation in the field of postal services.
- As the regional center for various UPU projects, APPU also takes the lead in ensuring that all technical and operational projects of the UPU are fulfilled in the region so that the region is integrated into the global postal network in the best possible way.
- Secretary General leads the activities of the Union and is also the Director of the Asian Pacific Postal College (APPC) which is the largest intergovernmental postal training institute in the region.



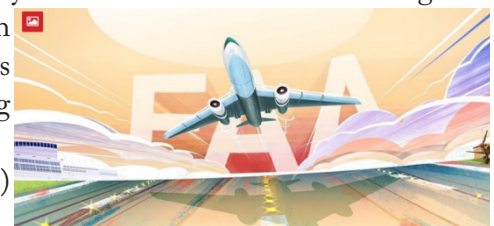
NOTAM (Notice to Air Missions)

Why in News

NOTAM system failure has disrupted US flights recently

Important Points

- Thousands of flights, within, into or out of the United States were delayed or cancelled due to a technical glitch.
- The US Federal Aviation Administration's (FAA) system, which alerts pilots and other flight personnel about hazards or any changes to airport facility services and relevant procedures, was not processing updated information, the civil aviation regulator's website showed.
- In an advisory, the FAA said its NOTAM (Notice to Air Missions) system had "failed".
- There was no immediate estimate for when it would be back, the website showed, though NOTAMs issued before the outage were still viewable.



NOTAM system

- A NOTAM is a notice containing information essential to personnel concerned with flight operations but not known far enough in advance to be publicized by other means.

- It states the abnormal status of a component of the National Airspace System (NAS) – not the normal status.
- NOTAMs indicate the real-time and abnormal status of the NAS impacting every user.
- NOTAMs concern the establishment, condition, or change of any facility, service, procedure or hazard in the NAS.
- NOTAMs have a unique language using special contractions to make communication more efficient.
- Without NOTAMs, aeroplanes are at a risk of running into flocks of birds or remaining unaware of slippery conditions on runways, for example. NOTAMs are listed location wise with pilots needing to check “25 nautical miles to either side of your full route of flight” for relevant NOTAMs.

An example of a NOTAM

- The system relays information about changes in conditions such as weather, volcanic activity, airspace restrictions and other factors, as well as unusual events such as parachute jumps, rocket launches and military exercises. It also advises pilots of extraordinary situations at airports, including icing, malfunctioning lights and the presence of flocks of birds, reported Simple Flying.

The failings of a centralised system

- The FAA runs a centralised NOTAM system, which displays on a monitor relevant information according to the scheduled flight path. However, as with any centralised system, glitches/failures have a widespread impact.
- Currently, it is unclear how long this system will be down. However, given its salience in ensuring safe flight operations, one thing is certain – operations will be affected till such time the system is back online.
- US airports, already under the scanner due to staffing shortages and crumbling infrastructure, have reported crowding and chaos due to the system failure.
- Passengers have complained about the lack of information and communication from the FAA and airlines.
- While the FAA has said normal services have now resumed, the US is still feeling the after-effects of the delays.

UN blacklists Pakistan's Abdul Rehman Makki

Why in News

Pakistan-based Abdul Rehman Makki, the deputy chief of the terror outfit Lashkar-e-Taiba, has been blacklisted as a global terrorist by the United Nations.

Important Points

- The UN Security Council's 1267 Al Qaeda Sanctions Committee added 68-year-old Makki, the brother-in-law of Hafiz Saeed, the founder of Lashkar-e-Taiba, to its list of designated terrorists recently after China withdrew its hold on a joint proposal by India and the US.
- On 16 January 2023, the Security Council Committee pursuant to resolutions 1267 (1999), 1989 (2011) and 2253 (2015) concerning ISIL (Da'esh), Al-Qaida, and associated individuals, groups, undertakings and entities approved the addition of the entry specified below to its ISIL (Da'esh) and Al-Qaida Sanctions List of individuals and entities subject to the assets freeze, travel ban and arms embargo set out in paragraph 1 of Security Council resolution 2610 (2021) and adopted under Chapter VII of the Charter of the United Nations.

Who is Abdul Rehman Makki?

- Makki was mainly known for his proximity to Hafiz Saeed, until the latter was jailed in 2019 for 35 years.
- He was born in Bahawalpur, Punjab Province of Pakistan.
- He continues to front for him now, as he had in the past when the LeT/Jamat-ud-Dawa (JuD) leader Hafiz Saeed, listed by the UN Security Council as a terrorist after the 2008 Mumbai attacks, went in and out of house arrest.



- The sanctions committee said that while Makki has held his leadership positions within LeT and JUD, the LeT has been responsible for or had involvement in prominent attacks, including the Red Fort Attack in which six terrorists stormed the Red Fort on December 22, 2000, and opened indiscriminate fire on the security forces present.
- Makki too uses the title of Hafiz, an honorific for someone who has memorised the Quran, as well as the title of Naib Emir of JuD.
- He would also be present at court hearings of Saeed's petitions challenging his detention.
- Known to be a fiery speaker, Makki has been a regular at the February Kashmir Solidarity Day rallies in Islamabad.
- Kashmir solidarity day is officially observed in Pakistan on February 5.
- At one such rally in 2010, two years after the Mumbai attacks, Makki threatened "rivers of blood" in India for not handing over Kashmir to Pakistan and threatened to seize it by force.

The 1267 Al Qaeda Sanctions Committee

- The committee is part of the UN Security Council and its job is to implement international sanctions against terrorists.
- The Al Qaeda committee was established as the Al-Qaida and Taliban Sanctions Committee on October 15, 1999, after Security Council Resolution 1267 designated al-Qaeda and the Taliban as terrorist bodies.
- In 2011, a separate committee was formed for the Taliban.
- Resolution 1267 was adopted under Chapter VII of the United Nations Charter and requires all UN member states to freeze the assets of, prevent the entry into or transit through their territories by, and prevent the direct or indirect supply, sale and transfer of arms and military equipment to any individual or entity associated with Al-Qaida, Osama bin Laden and/or the Taliban as designated by the Committee.

Who is Abdul Rehman Makki?

■ Place of birth:
Bahawalpur, Punjab
Province, Pakistan

■ Nationality: **Pakistan**

■ He is the **deputy chief of Lashkar-e-Taiba (LeT)/ Jamaat-ud-Dawa (JuD)** and Head of Political Affairs Wing of JuD/LeT

■ He also served as **head of LeT's foreign relations**



department and member of Shura (governing body). He is the brother-in-law of JuD/LeT chief Hafiz Muhammad Saeed

China's population drops for first time in 60 years

Why in News

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

Important Points

- China saw its population fall by roughly 850,000 last year – its first drop in six decades, bringing its population to around 1.41 billion at the end of 2022, the country's National Bureau of Statistics said.
- The government said that 9.56 million people were born in China in 2022, while 10.41 million people died.
- The drop, the worst since 1961, also makes it more probable that India will become the world's most populous nation this year.
- The year 1961 was the last of China's Great Famine, a result of Mao Zedong's large-scale changes in state policies.
- China's birth rate last year was 6.77 births per 1,000 people, down from a rate of 7.52 births in 2021, and marking the lowest birth rate on record.

The impact of the One-Child Policy

- One cause behind the fall in numbers in China is the one-child policy imposed between 1980 and 2015, limiting the number of children couples could have to one.
- China has said that the policy has helped prevent nearly 400 million births, but as the proportion of those in the working-age population began reducing, the policy became a matter of concern.
- The country's statistics bureau said the working-age population between 16 and 59 years old totalled 875.56 million, accounting for 62.0% of the national population, while those aged 65 and older totalled 209.78 million, accounting for 14.9% of the total.



- Men outnumbered women by 722.06 million to 689.69 million, reflecting the sex-selective births that were carried out because of the preference for the male child.

Low birth rates persist despite incentives

- High education costs and costs of living have put many people off having children, even as a number of incentives have been announced by the government.
- From 2016, all married couples were allowed to have a second child and in 2021, Beijing said it would allow couples to have three children.
- This is not unique to China, and countries such as Japan and South Korea, as well as others in Europe, are seeing similar trends.
- Measures such as flexing working hours for people parenting young children, work-from-home options and monetary incentives have also been announced.
- Shenzhen, a city in southern China, gives couples having a third child or more an annual allowance of over 6,000 yuan (\$890) until the child turns three. But there has been a limited impact, at best.

India to become most populous in 2023

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

Bhopal Declaration of G20

Why in News

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

Important Points

- A two-day ‘Think-20’ meeting under the G20 was held in Bhopal, during which experts and foreign guests discussed various topics including the ‘Environment-friendly lifestyle- ethical values and global good governance’.

About the declaration

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



- All the prominent speakers also acknowledged that India is doing important work in triangular cooperation and we can change the global scenario with this Indian model.
- The declaration has emphasized promoting traditional medicine systems like AYUSH and encouraging value-oriented development in infrastructure development.
- The forum also covered India's crucial contribution to the containment of COVID-19 and its response to Russia-Ukraine war.
- Student connect was also organised under G20 during the same event at Makhanlal Chaturvedi National University of Journalism and Communication, Bhopal.

What is think20?

- Think20 (T20) is an official Engagement Group of the G20.
- It serves as an “idea bank” for the G20 by bringing together think tanks and high-level experts to discuss policy issues relevant to the G20.
- T20 recommendations are synthesised into policy briefs and presented to G20 working groups, ministerial meetings, and leaders' summit to help the G20 deliver concrete policy measures.



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National Green Hydrogen Mission

Why in News

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

Important Points

- India's electricity grid is predominantly coal-based and will continue to be so, thus negating collateral benefits from a major EV push — as coal will have to be burnt to generate the electricity that will power these vehicles.
- In several countries that are pushing EVs, much of the electricity is generated from renewables — in Norway for example, 99 percent is hydroelectric power.
- In April 2022, state-owned Oil India Limited commissioned India's first 99.99 percent pure green hydrogen plant in Jorhat, Assam.
- Kerala has set up a high-level working group for its own Hydrogen Economy Mission to devise a strategic roadmap, policy formulations, and implementation plans for facilitating investments in green hydrogen and making the state “a green hydrogen hub”.
- Indian Oil Corporation Ltd's R&D centre, in collaboration with Tata Motor Limited, had earlier carried out trials of hydrogen fuel cell buses.
- Companies such as Reliance Industries Ltd, Adani Enterprises, JSW Energy, and Acme Solar have plans to tap the green hydrogen opportunity.
- Adani announced in June that it will collaborate with France's Total Energies to jointly create the “world's largest green hydrogen ecosystem”.
- US-based Ohmium International has commissioned India's first green-hydrogen factory in Karnataka.

About the Mission

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

- Based on the success of the pilot projects, the gas-based DRI units are to be encouraged for large-scale adoption of the process.

Hydrogen as a fuel

- Hydrogen, the most common element in nature, exists only in combination with other elements, and has to be extracted from naturally occurring compounds like water (which is a combination of two hydrogen atoms and one oxygen atom).
- Hydrogen is a clean molecule, but the process of extracting it is energy intensive.
- While hydrogen's potential as a clean fuel source has a history of nearly 150 years, it was only after the oil price shocks of the 1970s that the possibility of hydrogen replacing fossil fuels came to be considered seriously.
- Three carmakers — Japan's Honda and Toyota, and South Korea's Hyundai — having since moved decisively to commercialise the technology, albeit on a limited scale.
- The sources and processes by which hydrogen is derived are categorised by colour tabs.
- Hydrogen produced from fossil fuels is called grey hydrogen, which constitutes the bulk of the hydrogen generated today.
- Hydrogen generated from fossil fuels with carbon capture and storage options is called blue hydrogen,
- Hydrogen generated using electrolyzers powered by renewable power sources is called green hydrogen.

Green hydrogen potential

- Green hydrogen has specific advantages. One, it is a clean burning molecule that can decarbonise a range of sectors including iron and steel, chemicals, and transportation.
- Two, renewable energy that cannot be stored or used by the grid can be channelled to produce hydrogen.
- Green hydrogen is not commercially viable at present.
- The current cost in India is around Rs 350-400 per kg; it is likely to become viable only at a production cost of under Rs 100/ kg. This is what the Hydrogen Energy Mission aims for.

Auto sector, fuel cells

- Hydrogen is an energy carrier, not a source of energy. Hydrogen fuel must be transformed into electricity by a device called a fuel cell stack before it can be used to power a car or truck.
- A fuel cell converts chemical energy into electrical energy using oxidising agents through an oxidation-reduction reaction.
- Fuel cell-based vehicles most commonly combine hydrogen and oxygen to produce electricity to power the electric motor on board.
- Since fuel cell vehicles use electricity to run, they are considered electric vehicles (EVs).
- Inside each fuel cell, hydrogen is drawn from an onboard pressurised tank and made to react with a catalyst, usually made from platinum.
- As the hydrogen passes through the catalyst, it is stripped of its electrons, which are forced to move along an external circuit, producing an electrical current. This current is used by the electric motor to power the vehicle, with the only byproduct being water vapour.
- Hydrogen fuel cell cars have a near-zero carbon footprint. Hydrogen is about 2-3 times as efficient as burning petrol, because an electric chemical reaction is much more efficient than combustion. The Toyota Mirai and the Honda Clarity cars are powered by fuel cells.

National Green Hydrogen Mission (NGHM)

Why in News? Recently, the Union Cabinet approved NGHM with an outlay of over ₹17000 crores.

Key Highlights

- NGHM aims to make India a Global Hub for production, utilization and export of Green Hydrogen and its derivatives.
- Over 95% outlay for SIGHT (Strategic Interventions for Green Hydrogen Transition) programme.
- SIGHT programme provides two distinct financial incentive mechanisms-
 - Targeting domestic manufacturing of electrolyzers.
 - Production of Green Hydrogen.
- Implemented by the Ministry of New and Renewable Energy (MNRE).

About NGHM

- **Features**
 - Establishment of Green Hydrogen (GH2) ecosystem.
 - Robust Standards and Regulations.
 - PPP for R&D (Strategic Hydrogen Innovation Partnership-SHIP incentive) etc.
 - Coordinated skill development programme under Mission.
- **Expected outcomes by 2030**
 - At least 5 MMT GH2 production capacity per annum.
 - Addition of 125 GW RE capacity.
 - Over ₹ 8 Lac crore in investments; 6 Lac jobs creation.
 - Reduction in fossil fuel imports of over ₹ 1 Lac crore.
 - Abatement of 50 MMT annual Greenhouse gas emissions.

How is green hydrogen produced?

Clean energy generation: Hydro and solar are used to generate clean renewable energy. Add water: This energy is fed into the electrolyser with water. Green hydrogen production: The electrolyser splits the water molecules to create hydrogen and oxygen. Storage: The hydrogen gas is compressed and stored. Use: Once stored, the gas can be transported to a vehicle in the world for domestic or industrial use.

Green Hydrogen

Hydrogen emits only water when burned thus a clean energy source but its creation could be 'carbon' intensive. Based on production methods, hydrogen can be grey, blue, green and a few other types. Green Hydrogen is hydrogen produced by splitting water into hydrogen and oxygen using renewable electricity.

Color	GREY HYDROGEN	BLUE HYDROGEN	TURQUOISE HYDROGEN	GREEN HYDROGEN
Process	SMR or gasification	SMR or gasification with carbon capture (80-90%)	Pyrolysis	Electrolysis
Source	Methane or coal	Methane or coal	Methane	Renewable electricity

SMR: Steam methane reforming
* Synthetic hydrogen is an emerging decarbonisation option.

BIND Scheme

Why in News

The Cabinet Committee on Economic Affairs approved the proposal of the Ministry of Information and Broadcasting regarding Central Sector Scheme BIND Scheme.

Important Points

About Broadcasting Infrastructure and Network Development” (BIND)

- The Broadcasting Infrastructure and Network Development scheme of the Ministry is the vehicle for providing financial support to Prasar Bharati for expenses related to expansion and upgradation of its broadcasting infrastructure, content development and civil work related to the organisation.
- Prasar Bharati is considered the most important vehicle of information, education, entertainment and engagement for the people, especially in the remote areas of the country through Doordarshan and All India Radio.
- Prasar Bharati played a stellar role in communicating public health messages and awareness to the public during the Covid pandemic.
- The BIND scheme will enable the public broadcaster to undertake a major upgradation of its facilities with better infrastructure, which will widen its reach, including in the LWE [left-wing extremism], border and strategic areas and provide high quality content to the viewers.
- Another major priority area of the scheme is the development of high-quality content for both domestic and international audience and ensuring availability of diverse content to the viewers by upgradation of capacity of DTH platform to accommodate more channels.
- Purchase of OB vans and digital upgradation of DD and AIR studios to make them HD ready will be also be done as part of the project.
- At present, Doordarshan operates 36 TV channels, including 28 regional channels, and All India Radio operates more than 500 broadcasting centres.
- The scheme will increase coverage of AIR FM transmitters in the country to 66% by geographical area and 80% by population, up from 59% and 68% respectively.
- The scheme also envisages free distribution of over 800,000 DD free dish set-top boxes to people living in remote, tribal, LWE and border areas, according to the ministry of information and broadcasting.
- In addition to enhancing the scope of public broadcasting, the project for modernisation and augmentation of broadcast infrastructure also has the potential to generate indirect employment by way of manufacturing and services related to supply and installation of broadcast equipment.
- Content generation and content innovation for AIR & DD has the potential of indirect employment of persons with varied experience of different media fields in the content production sector including TV/ Radio production, transmission and associated media related services.
- Further, the project for expansion of the reach of DD Free Dish is expected to generate employment opportunities in the manufacturing of the DD Free Dish DTH Boxes.

All India Radio (AIR)

- All India Radio India's Public Service Broadcaster, the Radio vertical of Prasar Bharati has been serving to inform, educate and entertain its audiences since its inception, living up to its motto – 'Bahujan Hitaya : Bahujan Sukhaya'.
- One of the largest broadcasting organisations in the world in terms of the number of languages of broadcast and the spectrum of socio-economic and cultural diversity it serves, AIR's home service comprises of 470 Broadcasting centres located across the country, covering nearly 92% of the country's area and 99.19 % of the total population.
- Terrestrially, AIR originates programming in 23 languages and 179 dialects.
- The Directorate General, All India Radio functions under Prasar Bharati. Director General is the Head of the Department and is responsible for the overall administration and supervision of the entire AIR network.



About Doordarshan News and DD India (DD News and DD India)

- DD News and DD India are two news channels of Prasar Bharati, India's Public Service Broadcaster.
- These National News Channels are operational on a 24x7 basis to bring to the people of the country and viewers abroad, news and current affairs programmes in English and Hindi.
- These channels are successfully discharging their responsibilities to give balanced, fair, accurate and authentic news without sensationalizing as well as by carrying different shades of opinion.
- DD News was launched as a separate channel on 3 November, 2003. Its satellite footprint is available across the country.
- DD News is currently producing news content in Hindi, Sanskrit and Sign languages.
- Channel DD India is also in the process of being transformed into a News and Current Affairs channel to showcase India at the global level.
- The channel migrated to High Definition Platform in the month of October 2020, Aiming for the transformation of DD News into National Hindi News channel and DD India into complete English Global News channel various new initiatives have been taken in the past two years.
- The DD India channel has now been recognized by BARCAs an English News Channel and is constantly competing neck and neck with other top private English News channel.

108th Indian Science Congress

Why in News

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

Important Points

- The five-day session will take place at Rashtrasant Tukadoji Maharaj Nagpur University - which is celebrating its centenary this year.
- The previous edition of the ISC was held in Bengaluru in January 2020.
- According to a government release, the session is expected to focus on sustainable development with inclusive involvement of all sections of society including women, and deliberate on holistic growth, reviewed economies, and sustainable goals.
- The theme of this year's ISC is "Science and Technology for Sustainable Development with Women Empowerment."
- A unique hallmark of the ISC this year is the 'Children Science Congress' being organised to provide opportunities for children to use their scientific temperament and knowledge and to realize their creativity through scientific experiments.
- The sessions will discuss the 'Farmer's Science Congress' that will provide a platform to improve the bio-economy and attract youth to agriculture.
- The sessions will also include the 'Tribal Science Congress' which will provide a platform for the scientific display of indigenous ancient knowledge systems and practice, along with focusing on the empowerment of tribal women.
- The Plenary Sessions will feature Nobel laureates, leading Indian and foreign researchers, experts, and technocrats from a wide variety of fields, including space, defence, IT, and medical research.
- The sessions will showcase applied research in Agriculture and Forestry Sciences, Animal, Veterinary, and Fishery Sciences, Anthropological and Behavioural Sciences, Chemical Sciences, Earth System Sciences, Engineering Sciences, Environmental Sciences, Information and Communication Science and Technology, Material Sciences, Mathematical Sciences, Medical Sciences, New Biology, Physical Sciences, and Plant Sciences, as per the release.
- A special programme - the mega expo 'Pride of India' - will display the strengths and achievements of the government, corporate, PSUs, academic and R&D institutes, innovators, and entrepreneurs from all across the country.
- A special programme to showcase the contribution of women in science and technology will also be held. The event will witness lectures by renowned women scientists.
- The first session of ISC was held in 1914.



SPRINT scheme

Why in News

The Indian Navy has signed an agreement with Sagar Defence Engineering Pvt. Ltd for armed autonomous boat swarms under 'SPRINT' scheme.

Important Points

- This is the 50th contract under 'SPRINT' scheme.
- The agreement refers to an Indian Navy project of the Defence India Start-up Challenge (DISC 7) SPRINT initiative, and the Indian Navy expects to place an order for 12 systems after the construction of the weaponised autonomous unmanned boat.
- The platform will be able to conduct a range of navy and security tasks including high-speed interdiction; surveillance; constabulary operations; Command, Control, Communications, Computers (C4) Intelligence, Surveillance and Reconnaissance (C4ISR); and low-intensity maritime operations.

About 'SPRINT' scheme

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



Naval Innovation and Indigenisation Organisation (NIIO)

- It was launched by the Defence Minister in 2020.
- The NIIO puts in place dedicated structures for the end users to interact with academia and industry towards fostering innovation and indigenisation for self-reliance in defence in keeping with the vision of Atmanirbhar Bharat.
- The NIIO is a three-tiered organisation.
- Naval Technology Acceleration Council (N-TAC) that brings together the twin aspects of innovation and indigenisation and provide apex level directives.
- A Technology Development Acceleration Cell (TDAC) was created for induction of emerging disruptive technology in an accelerated time frame.

BharOS

Why in News

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

Important Points

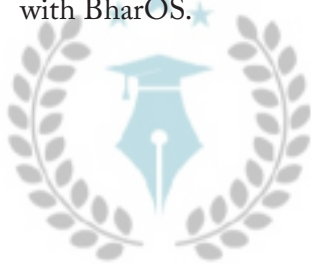
BharOS

- BharOS is an AOSP (Android Open Source Project) based operating system with no Google apps or services.
- It is developed by JandK Operations Private Limited (JandKops), which is a non-profit organization incubated at IIT Madras.
- The good thing about this mobile operating system is that this one comes with No Default Apps (NDA). This basically means that users will get most of storage space, unlike Android.
- The OEMs ship phones with default Google apps as well as some native apps. With BharOS, one won't be forced to use apps that they may not be familiar with or that they may not trust.
- One will also be able to receive 'Native Over The Air' (NOTA) updates, similar to Android phones. The developers assert that NOTA updates are automatically downloaded and installed on the device, so users don't need to manually initiate the process.
- Furthermore, the OS will also offer access to trusted apps from organization-specific Private App Store Services (PASS).

- A PASS provides access to a curated list of apps that have been thoroughly vetted and have met certain security and privacy standards of organizations.
- This means users can be confident that the apps they are installing are safe to use and have been checked for any potential security vulnerabilities or privacy concerns.

How is BharOS different from Android?

- Technically, BharOS is not that different from Android's Google OS. In fact, it is based on the AOSP (Android Open Source Project).
- The major difference between BharOS and Google's Android OS is the fact that BharOS does not ship with Google services, and it will be a barebone operating system, which allows users to install apps of their own interest.
- While BharOS is known as an indigenous operating system, it is still based on AOSP, hence, it is not that different from Google's stock Android in terms of features and UI.
- Not just that, BharOS also doesn't come with any pre-built applications. Having no pre-installed applications will allow users to sideload an app of their choice.
- However, sideloading an APK could compromise the device's security, and could make the device more vulnerable to hacking.
- It is also interesting to see that the current build of BharOS has third-party apps like DuckDuckGo and Signal as default browsers and messaging apps.
- It is also interesting to see if the team that has developed BharOS will partner with OEM to launch phones with BharOS.



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The new Dexa scan tests for cricket player

Why in News

The Board of Control for Cricket in India (BCCI) re-introduced Yo-Yo test and Dexa scan results as criteria for selection of Indian cricketers.

Important Points

- With the start of a new year, the Board of Control for Cricket in India (BCCI) will hope to usher in a new beginning for Indian cricket.
- As India hosts the 50-over World Cup in 2023, the team will hope to win its first piece of silverware on the biggest stage since 2011.
- BCCI announced the (re)introduction of the Yo-Yo Test and the introduction of Dexa scans for the purposes of selection to the team.

What is Dexa scan tests?

- A DEXA scan is an imaging test that measures bone density (strength).
- DEXA scan results can provide helpful details about your risk for osteoporosis (bone loss) and fractures (bone breaks).
- Through Dexa tests, the trainers will be able to measure body fat percentage, lean muscle mass, water content and bone density.
- It helps to understand where the fat is and whether the training methods are yielding the result. It is all linked to a cycle.
- It is part of testing protocols which should have become mandatory long back. Some teams have been doing this for 10 years. It is a fool-proof method.
- Skinfold can be manipulated and each time different results can show up. But with Dexa it will be uniform and the data can be used for the future as well.

Why this move?

- The Dexa scan will be used to provide a more accurate picture of the players' fitness and physical condition, allowing the team to customise plans for players.
- It will also allow better insight into players' recoveries, ensuring that players are not rushed back too early.
- The introduction of scientific methods such as the Dexa scan and fitness tests such as the Yo-Yo test will be a crucial cog in how these players are monitored and how they prepare for the big tournament.

What is the Yo-Yo test?

- The Yo-Yo intermittent test is aimed at estimating performance in stop-and-go sports like football, cricket, basketball and the like.
- It was conceived around the early 1990s by Jens Bangsbo, a Danish soccer physiologist.
- The Yo-Yo test is not new to the India team as it was first brought in ahead of the 2019 World Cup during the Virat Kohli-Ravi Shastri era.
- Initially it was not well received by some of the players.
- But once players began to see the difference it made on the field, especially with regards to agility and movement, they increased the desired Yo-Yo test score from 16.1 to 17.
- However, in the post-pandemic world, with Covid protocols in place, the team opted for a 2km run (under 7.30 mins) test which was used as a fitness parameter.
- The new updated yo-yo test involves shuttling over a 20-meter distance at increasing speeds, the two-kilometers time trial has to be accomplished in 8 minutes and 15 seconds for fast bowlers, and 8 minutes and 30 seconds for the rest.

What are the types of YoYo Tests?

There are four versions of the Yo-Yo Intermittent test:

- Recovery Level 1 (YoYo IR1). This is the most popular version focusing “on the capacity to carry out intermittent exercise leading to a maximal activation of the aerobic system”.
- Recovery Level 2 (YoYo IR2). This is a tougher version of “Recovery Level 1”. It “determines an individual’s ability to recover from repeated exercise with a high contribution from the anaerobic system”.
- Endurance Level 1 (YoYo IE1). This may be used to test participants in less vigorous sports that usually last longer.
- Endurance Level 2 (YoYo IE2). This is a tougher version of “Endurance Level 1”.



International Year of Millets-2023

Why in News

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

Important Points

International Year of Millets

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

About Millets

- ‘Millets’ were among the first crops to be domesticated in India with several evidence of its consumption during the Indus valley civilization.
- Being grown in more than 130 countries at present, Millets are considered traditional food for more than half a billion people across Asia and Africa.
- In India, millets are primarily a kharif crop, requiring less water and agricultural inputs than other similar staples.
- Millets are important by the virtue of its mammoth potential to generate livelihoods, increase farmers’ income and ensure food & nutritional security all over the world.
- Millets can grow on arid lands with minimal inputs and are resilient to changes in climate.
- They are therefore an ideal solution for countries to increase self-sufficiency and reduce reliance on imported cereal grains.
- India is one of the leading producers of millets in the world with an estimated share of around 41 percent in the global production.
- India’s top five millet producing states are Rajasthan, Maharashtra, Karnataka, Gujarat and Madhya Pradesh. Share of export of millets is nearly 1% of the total millet production.
- Exports of millets from India include mainly whole grain and the export of value-added products of millets from India is negligible.

- India's major millet exporting countries are U.A.E, Nepal, Saudi Arabia, Libya, Oman, Egypt, Tunisia, Yemen, U.K and U.S.A. The varieties of millets exported by India include Bajra, Ragi, Canary, Jawar, and Buckwheat.
- The major millet importing countries in the world are Indonesia, Belgium, Japan, Germany, Mexico, Italy, the U.S.A, United Kingdom, Brazil and Netherlands.
- There are 16 major varieties of millet, which are produced and exported, including Sorghum (Jowar), Pearl Millet (Bajra), Finger Millet (Ragi) Minor Millets (Kangani), Proso Millet (Cheena), Kodo Millet (Kodo), Barnyard Millet (Sawa/Sanwa/Jhangora), Little Millet (Kutki), Two Pseudo Millets (BuckWheat/Kuttu), Amaranthus (Chaulai) and Brown Top Millet.
- It is estimated that the millets market is set to grow from its current market value of more than USD 9 billion to over USD 12 billion by 2025.

Oscar reminder list

Why in News

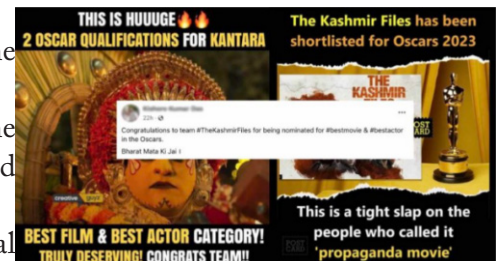
The Kashmir Files and other Indian films have appeared on the “Reminder List of Productions Eligible for the 95th Academy Awards”.

Important Points

- RRR, Kantara, Gangubai Kathiawadi and The Kashmir Files were among the Indian films of 2022 that were back in the news after the Academy of Motion Picture Arts and Sciences (AMPAS) released a list of 301 feature films that were eligible for the 95th Academy Awards.
- The Academy Awards (Oscars), to honour films released in 2022, will be announced at a ceremony in the Dolby Theatre in Los Angeles on March 12, 2023.
- In fact, The Kashmir Files — and other Indian films — have appeared on the “Reminder List of Productions Eligible for the 95th Academy Awards”, which includes movies that can officially compete in various categories.
- The AMPAS issues a Reminder List before the Oscars every year.
- It does not mean that the films on it will necessarily advance to the final nominations for the Awards.

What is the ‘Reminder List’ for the Oscars?

- The ‘Reminder List’ is brought out by the Academy ahead of the final nominations.
- The Reminder List is the list of films that have been watched by the Academy members, and can be considered eligible to be qualified for nominations in various categories.
- The List makes up the larger pool of films out of which the final nomination list emerges.
- However being included in the Reminder List is no guarantee that a film will appear in the nominations, or even that it will get a leg-up in the process.
- For example, the Tamil films starring Suriya Jai Bhim (2021) and Soorarai Pottru (2020) were on the last two years’ lists — but neither film could make it any further.



What makes a film eligible for Oscar consideration?

- The Academy has very broad eligibility rules for movies to be considered for Oscars.

According to the Oscars website, to be eligible,

- feature films must open in a commercial motion picture theater in at least one of six U.S. metropolitan areas: Los Angeles County; the City of New York; the Bay Area; Chicago, Illinois; Miami, Florida; and Atlanta, Georgia,
- they must have screened between January 1, 2022 and December 31, 2022 and complete a minimum qualifying run of seven consecutive days in the same venue, and
- feature films must have a running time of more than 40 minutes.

What other Indian titles are there on this year's List?

- There are RRR, Kantara, Gangubai Kathiawadi, and Pan Nalin's Chhello Show (Last Film Show; Gujarati), which is India's official Oscar entry in the category of Best International Feature Film.

- Also on the List are the Marathi titles Me Vasantrya and Tuzhya Sathi Kahi Hi, R Madhavan's Rocketry: The Nambi Effect, Iravin Nizhal (Tamil), and Vikrant Rona (Kannada).
- The Gray Man, an American action thriller that features Tamil actor Dhanush in a prominent role, has also made it to the Reminder List.

And have any actual shortlists been announced yet?

- Yes, on December 21 last year, the Academy announced shortlists for 10 categories: Documentary Feature Film (15 films), Documentary Short Film (15), International Feature Film (15), Makeup and Hairstyling (10), Music (Original Score) (15), Music (Original Song) (15), Animated Short Film (15), Live Action Short Film (15), Sound (10), and Visual Effects (10). The shortlist is the stage before the final nominations.

Have any Indian titles been shortlisted?

- Yes, four titles — perhaps the most ever — have made it to shortlists in four different categories.
- The shortlist is the stage before the nominations.
- Shaunak Sen's All That Breathes has been shortlisted in the Documentary Feature Film category. Kartiki Gonsalves' The Elephant Whisperers is on the Documentary Short Film shortlist.
- Chhello Show (Last Film Show) is on the International Feature Film shortlist, and the 'Naatu Naatu' number from RRR is in the Music (Original Song) shortlist.
- On January 10, the song won the Golden Globe for the Best Original Song for its composer MM Keeravani, along with singers Kaala Bhairava and Rahul Sipligunj.

Golden Globe Award

Why in News

SS Rajamouli's RRR film made history by winning the 80th Golden Globe award for Best Original song for Naatu Naatu.

Important Points

- The Jr NTR and Ram Charan film was nominated in two major categories – Best Original song and Best Non-English film.
- While it lost the latter to an Argentinian film, it managed to beat international heavy weights like Taylor Swift, Rihanna and Lady Gaga in the song category.
- Naatu Naatu is the first Asian song to win the Golden Globe award.
- Music director for the song is MM Keeravaani, lyricist Chandrabose and singers Rahul Sipligunj and Kaala Bhairava.

About Golden Globe award

- The Golden Globe Awards are accolades bestowed by the Hollywood Foreign Press Association starting in January 1944, recognizing excellence in both American and international film and television. Beginning in 2022, there are 105 members of the HFPA.
- The annual ceremony at which the awards are presented is normally held every January and has been a major part of the film industry's awards season, which culminates each year in the Academy Awards.
- The eligibility period for the Golden Globes corresponds to the calendar year (from January 1 through December 31).
- The Hollywood Foreign Press Association (HFPA) was founded in 1943 by Los Angeles-based foreign journalists seeking to develop a better organized process of gathering and distributing cinema news to non-U.S. markets.
- The 1st Golden Globe Awards, honoring the best achievements in 1943 filmmaking, were held in January 1944, at the 20th Century-Fox studios.



Europe's largest known deposit of rare earth elements found in Sweden

Why in News

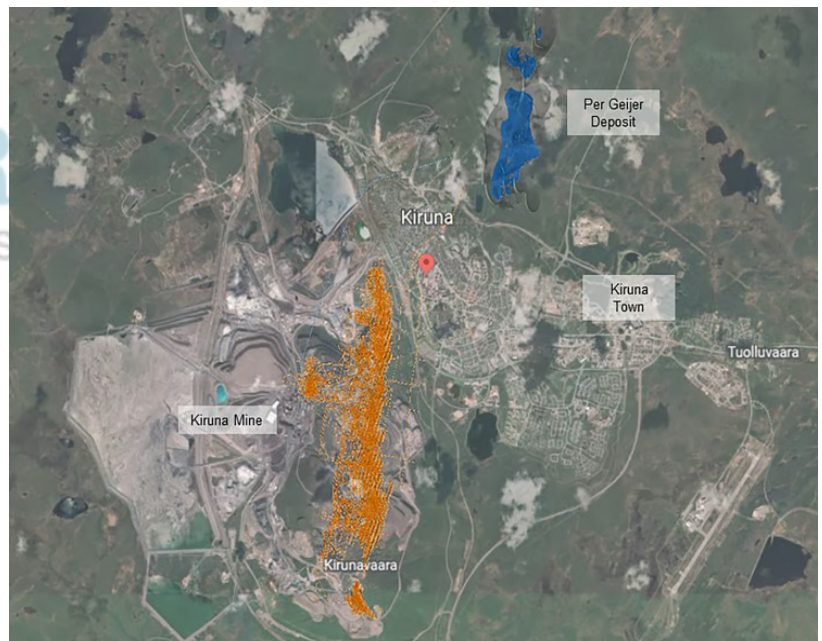
Swedish state-owned mining company, LKAB has recently announced that it has discovered more than one million tonnes of rare earth oxides in the northern area of the country which is the largest known deposit in Europe.

Important Points

- Currently, no rare earths are mined in Europe and it mostly imports them from other regions.
- According to a report in the BBC, 98 percent of rare earths used by the European Union were sent by China.
- The recent discovery can prove to be a significant turning point not just for the EU but also for other western countries as they have been trying to reduce their reliance on China for the import of these rare earth elements and other key industrial supplies, especially since the outbreak of the coronavirus pandemic.
- Over the years, China has repeatedly used its monopoly in the rare earths market for furthering its geopolitical agendas.
- For instance, in 2010, Beijing blocked Japan's access to rare earth elements over Tokyo's detention of a Chinese fishing trawler captain.
- Therefore, it didn't come as a surprise when last year in August, the US and 10 other nations including Australia, Canada, Finland, France, Germany, Japan, the Republic of Korea (South Korea), Sweden, the United Kingdom, and the European Commission came together in a bid to break China's dominance in the global market and formed the Minerals Security Partnership (MSP).

What are rare earths?

- Rare earth elements or rare earth metals are a set of 17 chemical elements in the periodic table, the 15 lanthanides, plus scandium and yttrium, which tend to occur in the same ore deposits as the lanthanides, and have similar chemical properties.
- The 17 rare earths are cerium (Ce), dysprosium (Dy), erbium (Er), europium (Eu), gadolinium (Gd), holmium (Ho), lanthanum (La), lutetium (Lu), neodymium (Nd), praseodymium (Pr), promethium (Pm), samarium (Sm), scandium (Sc), terbium (Tb), thulium (Tm), ytterbium (Yb), and yttrium (Y).
- Despite their classification, most of these elements are not really "rare". One of the rare earths, promethium, is radioactive.
- These elements are important in technologies of consumer electronics, computers and networks, communications, clean energy, advanced transportation, healthcare, environmental mitigation, and national defence, among others.
- Scandium is used in televisions and fluorescent lamps, and yttrium is used in drugs to treat rheumatoid arthritis and cancer.
- Rare earth elements are used in space shuttle components, jet engine turbines, and drones. Cerium, the most abundant rare earth element, is essential to NASA's Space Shuttle Programme.
- In recent years, rare earths have become even more important because there has been an increase in demand for green energy.
- Elements like neodymium and dysprosium, which are used in wind turbine motors, are sought-after more than ever as wind mills across the world continue to grow.
- Moreover, the push for switching from internal combustion cars to electric vehicles has also led to a rise in demand for rare earth magnets — made from neodymium, boron, and iron — and batteries.



Hockey World Cup 2023

Why in News

India hosted the ongoing 15th Men's FIH Hockey World Cup.

Important Points

Mens Hockey World Cup

- The Men's FIH Hockey World Cup is an international field hockey competition organised by the International Hockey Federation (FIH).
- The tournament was started in 1971. It is held every four years, bridging the four years between the Summer Olympics.
- Pakistan is the most successful team, having won the tournament four times.
- The Netherlands and Australia have each won three titles, and Germany has won two titles. Belgium and India(1975) have both won the tournament once.
- The 2018 tournament was held in Bhubaneswar, India from 28 November to 16 December.
- Belgium defeated Netherlands in a penalty shoot-out 3–2 after the match ended in a 0–0 draw to win their first World Cup title. The World Cup expanded to 16 teams in 2018.
- 16 teams per gender qualify to participate in the FIH Hockey World Cup through the Hockey World Cup Qualification Tournaments will participate in the FIH Hockey World Cup.
- The 2023 Men's FIH Hockey World Cup is the quadrennial world championship for men's national field hockey teams organized by the International Hockey Federation.
- The tournament was held at the Kalinga Stadium in Bhubaneswar and at the Birsa Munda International Hockey Stadium in Rourkela, India from 13 to 29 January 2023.
- This is the fourth time that India hosted the tournament including, 2018, 2010, 1982.

About Hockey

- Defined by break-neck pace, on the surface, hockey is a simple game to follow.
- Field hockey is a team sport played between two teams of 11 players each.
- Each team has one goalkeeper, who is permitted to use his hands and feet to prevent goals, defenders, midfielders and attackers, who are only allowed to use their sticks to control the ball.
- The coach determines the formation of a team which decides the distribution of the outfield players in the playing 11.
- The aim of the game is to score in the opposing team's goal while preventing the opposition from scoring in yours.
- To advance the ball, players can either pass to their teammates using their sticks or dribble the ball – this is done by pushing the ball forward while running with it.
- Crucially, to score a goal, the scorer has to enter the opposition D – the D-shaped box 16 yards in front of the goal. A shot from outside the D is not counted.
- The playing area is a rectangle, marked with white lines on the blue astroturf on which the game is played.

Key terms used in Hockey

Following are some of the commonly used terms by the commentators to describe hockey-specific rules and ways of play:

Types of hockey hits

- Playing hockey requires tremendous skill and technique from the players. Players have to master various ways to hit the ball with their sticks and know the right situations to use them. Importantly, the players can only touch the ball with the flat part of the stick. A few common hitting techniques are,
- Standard hit: the most basic and commonly used technique to hit the ball. The player uses a swinging motion of the stick towards the ball to hit it.
- Sweep/Slap Hit: a similar motion as the one above, except closer and more parallel to the turf. It uses more power and generally, the ball sticks to the ground. Players will often use this type of hit to score a goal.
- Scoop: a hit where a player raises the ball off the ground by getting the head of the stick under the ball and using a lifting motion. This can be used with deftness to lift the ball above an outstretched goalkeeper as well as with more power to make long passes.

- Flick: a useful technique which also lifts the ball up, but with a jerking action of the wrists. It is generally used to score goals.
- Tomahawk/Reverse backhand: played with the edge of the stick when the stick is held in the reverse grip (sometimes called the frying pan grip). This is a useful technique, especially for right handed players playing on the left side and can be used to shoot or pass.
- Jink: is a typical skill used by a player while dribbling to lift the ball over the stick of another player.

Ways to win the ball

- An important aspect of hockey is defenders trying to win the ball back from the offence. To do this, they can employ some of the following techniques.
- Tackle: players are allowed to dispossess opponents using their sticks. A clean/legal tackle manages to dispossess the opponent by hitting them or their sticks with the defenders own stick.
- Interception: players can also intercept passes to regain possession.

Offences and resulting penalties

- During the game, players can commit various offences which are then penalised. Some common fouls entail the ball touching your feet, tackling from behind, third party interference (two players are not allowed to tackle an attacking player at the same time), obstruction (when a player or a stick comes in between the ball and the other player) and dangerous play.
- Dangerous play can be called when the stick is raised above one's waist or when the umpire deems that a player endangers the opponent in any way while attacking or defending the ball.
- Hitting the ball in the air is also not allowed, though this is often a subjective call made by referees.

Fouls are penalised in different ways

- Free hits are awarded to the team against which a foul has been committed. Players are allowed to pass or carry the ball (upto three yards) during a free hit.
- Penalty Corners are awarded to the attacking team for an offence or foul committed by the defensive team in their own D. The ball will be placed on the baseline, and then passed to the teammates at the top of the attacking D for a shot on goal. Players use a technique called a drag flick to convert penalty corners. Penalty corners are among the most lucrative opportunities for teams to score.
- Penalty strokes are awarded for intentional fouls on an attacker who has possession of or opportunity to play the ball in the circle or for fouls in the penalty circle that prevent a "certain goal." These are the most severe penalties given in hockey.

Men's FIH Hockey World Cup Winners

Year	Winner	Final Score	Runner-up	Third place	Host City
2018	Belgium	0-0 penalty (3-2)	Netherlands	Australia	Bhubaneswar, India
2014	Australia	6-1	Netherlands	Argentina	The Hague, Netherlands
2010	Australia	2-1	Germany	Netherlands	New Delhi, India
2006	Germany	4-3	Australia	Spain	Mönchengladbach, Germany
2002	Germany	2-1	Australia	Netherlands	Kuala Lumpur, Malaysia
1998	Netherlands	3-2 extra time	Spain	Germany	Utrecht, Netherlands
1994	Pakistan	1-1 penalty (4-3)	Netherlands	Australia	Sydney, Australia
1990	Netherlands	3-1	Pakistan	Australia	Lahore, Pakistan
1986	Australia	2-1	England	West Germany	London, England
1982	Pakistan	3-1	West Germany	Australia	Bombay, India
1978	Pakistan	3-2	Netherlands	Australia	Buenos Aires, Argentina
1975	India	2-1	Pakistan	West Germany	Kuala Lumpur, Malaysia
1973	Netherlands	2-2 penalty(4-2)	India	West Germany	Amstelveen, Netherlands
1971	Pakistan	1-0	Spain	India	Barcelona, Spain

Procedure for selecting an Olympics host

Why in News

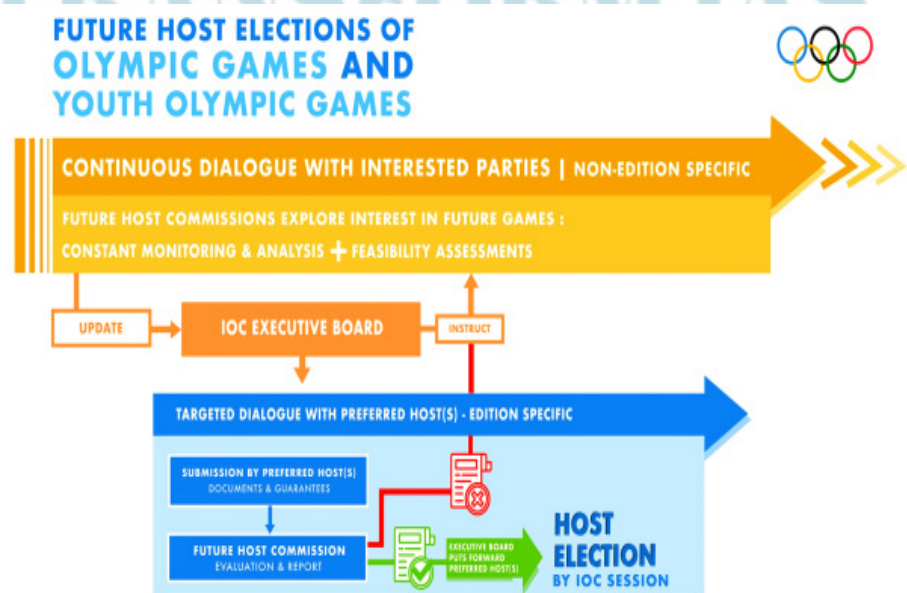
To review the initial preparations for Gujarat's bid for the 2036 Olympics Games, Union Home Minister Amit Shah chaired a high-level meeting recently.

Important Points

- To review the initial preparations for Gujarat's bid for the 2036 Olympics Games, Union Home Minister Amit Shah chaired a high-level meeting in Ahmedabad.
- A successful bid to host the games was also mentioned in the BJP's manifesto for the Gujarat elections – which it won – in 2022.
- The next three Olympics' hosts – Paris (France) in 2024, Los Angeles (the US) in 2028 and Brisbane (Australia) in 2032 – have already been decided.

What is the Procedure for selecting an Olympics host?

- The International Olympic Committee (IOC) is the body responsible for the host city's selection.
- It has 99 member countries, each having its own IOC representative, who is often an ex-Olympian or athlete.
- Nita Ambani, Founder and Chairperson of Reliance Foundation, is India's representative.
- In 2019, the voting-based selection process came under fire over allegations of corruption and for resulting in cities pouring in large amounts of money for the games, only for structures like stadiums to become abandoned later on.
- This is because many countries find it difficult to fill huge stadiums with local teams and justify the disproportionate maintenance costs.
- Under the new process, termed as “revolutionary”, and one that will lead to “savings for potential hosts, as well as more sustainable projects and master plans”, now the IOC goes into direct consultations with interested cities.
- The process is overseen by two permanent 'Future Host Commissions': one for the summer and one for the winter Games.
- Both are gender-balanced and represent a full range of Olympic stakeholders, including athletes, International Federations (IFs), National Olympic Committees (NOCs) and the International Paralympic Committee (IPC).
- These Commissions make recommendations to the IOC Executive Board (EB) regarding possible future hosts.
- The EB includes the IOC President, four Vice-Presidents and ten other members. All the EB members are elected by the IOC Session by secret ballot, by majority vote, for a four-year term.
- It decides if any of the candidatures should be put forward for election by the Session.
- Based on their observations of these countries' bids and further discussions with those countries, the Future Host Commission recommends a potential host, which the Executive Board then has to take a call on. Finally, the IOC voting happens.
- Whether a city gets selected depends on how it is able to negotiate with the different groups of selectors mentioned here.



Can India be selected to host the Olympics?

- Former Croatia president Kolinda Grabar-Kitarovic heads the IOC commission that will select the host city for the 2036 Games, with a decision to be taken between 2025 and 2029.

- Whether a city gets selected depends on how it is able to negotiate with the different groups of selectors.
- The finances and the sporting culture of a country also come into play – a reason why Ahmedabad is focusing on infrastructure development.
- India has also, crucially, never figured in the top-ranked teams at the end of the games.
- But with constant efforts, and an IOC-led change in the way things have been done so far in the process, the bid might come sooner than previously thought.

Etalin hydroelectric project(EHEP)

Why in News

The Forest Advisory Committee(FAC) has asked the Arunachal Pradesh government to file a fresh proposal for forest diversion and the construction of the EHEP due to non-compliance to conditions stipulated by the FAC.

Important Points

Etalin hydroelectric project(EHEP)

- The 3,097-megawatt EHEP was proposed to be developed as a joint venture between Jindal Power Ltd and the Hydropower Development Corporation of Arunachal Pradesh Ltd.
- The Etalin project was first envisaged in 2008.
- The plan combined two run-of-the-river schemes with limited storage requiring concrete gravity dams on rivers Tangon and Dri. It ran into several controversies since its inception in 2008 over concerns of ecological damage, forest invasion and tribal displacement.
- It involves diversion of over 1,150 hectares of forest area which is classified as an “inviolable area” as prescribed by the environment ministry. The inviolable forest area is an area where no developmental project is allowed.
- The project area falls under the richest bio-geographical province of the Himalayan zone and one of the mega biodiversity hotspots of the world.
- The Union power ministry and impact assessment division of MoEF&CC gave the nod for the project.
- FAC then formed committees and ordered bodies concerned to submit reports on the impact of forest land diversion required for the project in the northeastern state’s Dibang Valley.
- The project was mired in controversy, with wildlife scientists and conservationists flagging environmental threats due to the plant in a biodiversity hotspot.



Dri & Tangon River

- Tangon River is tributaries of the Dibang river.
- The Dri streams are one of main tributaries of the Dibang River besides the Ich, Ahu, and Ithun.
- The Sisar, Mathun, Tangon, Dri, Ithun and Emra are the major tributaries of Dabang river.
- The Dibang is also joined by a number of tributaries such as the Airi, Ilu, Imu, Ahi, Ashu, Epipani and Eze (Deopani) rivers during its course.

Andaman and Nicobar Islands

Why in News

21 Andaman and Nicobar Islands named after Param Vir Chakra awardees

Important Points

- Prime Minister Narendra Modi named 21 largest unnamed islands of Andaman and Nicobar Islands after 21 Param Vir Chakra awardees to mark Parakaram Diwas, the birth anniversary of Netaji Subhas Chandra Bose.
- During a programme in Port Blair, the Prime Minister through video-conferencing also unveiled the model of the National Memorial dedicated to Netaji, which will be built on Netaji Subhas Chandra Bose Dweep.
- The Ross Islands, part of the Andaman Islands, was renamed Netaji Subhas Chandra Bose Dweep by Modi in 2018, while the Neil Island and Havelock Island were renamed Shaheed Dweep and Swaraj Dweep, respectively.

- The proposed memorial will have a museum, a cable car ropeway, a laser-and-sound show, a guided heritage trail through historical buildings and a theme-based children's amusement park, besides a resto lounge.
- This land of Andaman is the land where the Tricolour was hoisted for the first time, where the government of independent India was formed for the first time.
- These islands have been named after the 21 Param Vir Chakra awardees, viz, Major Somnath Sharma; Subedar and Hony Captain (then Lance Naik) Karam Singh, MM; 2nd Lt Rama Raghoba Rane; Nayak Jadunath Singh; Company Havildar Major Piru Singh; Capt GS Salaria; Lieutenant Colonel (then Major) Dhan Singh Thapa; Subedar Joginder Singh; Major Shaitan Singh; CQMH Abdul Hamid; Lt Col Ardeshir Burzorji Tarapore; Lance Naik Albert Ekka; Major Hoshiar Singh; 2nd Lt Arun Khetrpal; Flying Officer Nirmaljit Singh Sekhon; Major Ramaswamy Parameswaran; Naib Subedar Bana Singh; Captain Vikram Batra; Lt Manoj Kumar Pandey; Subedar Major (then RifleMan) Sanjay Kumar; and Subedar Major retd (Hony Captain) Grenadier Yogendra Singh Yadav.

About Param Vir Chakra

- The Param Vir Chakra (PVC) is India's highest military decoration, awarded for displaying distinguished acts of valour during wartime.
- On 26 January 1950, celebrated as Republic Day of India, the PVC was instituted as a Gallantry Medal with retrospective effect from 15 August 1947 by Dr. Rajendra Prasad, the then President of India.
- The Medal translates as the "Wheel of the Ultimate Brave", and the award is granted for "most conspicuous bravery in the presence of the enemy".
- The medal was designed by Mrs. Savitri Khanolkar. The designer drew inspiration from sage Dadhichi, a vedic rishi who made the ultimate sacrifice by giving up his body so that the Gods could make a deadly weapon called Vajra or Thunderbolt from his spine.
- The medal is cast in bronze. In the centre, on a raised circle, is the state emblem, surrounded by four replicas of Indra's Vajra, flanked by the sword of Shivaji.
- The decoration is suspended from a straight swiveling suspension bar, and is held by a 32 mm purple ribbon.



National Voters Day 2023

Why in News

13th National Voters' Day (NVD) celebrated on 25th January 2023

Important Points

- Every year voter's day falls on January 25, which also marks the foundation day of the Election Commission of India.
- It was in the year 1950 that the first election commission of India came into force.
- The day reminds the right to vote and focuses on the concept of voting and enrollment of voters.
- India's democracy lies in voting rights. And observing this day spreads the importance of being a part of the country's electoral process.
- The day has its significance for increasing the active participation of the voters in India. And the nation needs the right leader to be selected by the younger generation for the futuristic development of the country.
- Theme
- The theme for this year's National Voters Day is 'Making Elections Inclusive, Accessible and Participative.'



History

- January 25, 2011, was the first time that National Voters Day was celebrated in India.
- The government of India was chosen democratically.
- Everyone has the fundamental right to cast a ballot.
- She/he has the authority to choose their representative from a group of people they believe are qualified to lead the country, solve problems faced by regular people, transform lives, etc.
- Being aware of National Voters Day in India is crucial because the future of our country rests on the leader we choose.
- The history of this day lies when the Election commission started to spot eligible voters who turned out to be 18 years of age on January 1. Later, they enrolled themselves as voters and the Electoral Photo Identity Cardm(EPIC) was handed in.

PARAKH

Why in News

The National Council for Education Research and Training (NCERT) notified the PARAKH. India's first national assessment regulator.

Important Points


What is PARAKH?

- The Performance Assessment, Review, and Analysis of Knowledge for Holistic Development (PARAKH) as a centre is established within the education survey division of the NCERT
- It works on setting norms, standards and guidelines for student assessment and evaluation for all recognised school boards in the country.
- The regulator aims to set up assessment guidelines for all boards to help remove disparities in scores of students enrolled with different state boards.
- PARAKH has been launched as part of the implementation of the National Education Policy (NEP)-2020 that envisaged a standard-setting body to advise school boards regarding new assessment patterns and latest research, and promote collaborations between them.



NATIONAL EDUCATION POLICY 2020

2/2

Higher Education curriculum to have Flexibility of Subjects		
Multiple Entry/Exit to be allowed with appropriate certification		
 <p>Academic Bank of credits to be established to facilitate transfer of credits</p>	<p>National Research Foundation to be established to foster a strong research culture</p>	<p>Affiliation System to be phased out in 15 years with graded autonomy to colleges</p>
<p>NEP 2020 advocates increased use of technology with equity; National Educational Technology Forum to be created</p>	<p>NEP 2020 emphasizes setting up of Gender Inclusion Fund and Special Education Zones for disadvantaged regions and groups</p>	<p>National Institute for Pali, Persian and Prakrit , Indian Institute of Translation and Interpretation to be set up</p>

PARAKH will work on three major assessment areas:

- o Large-scale assessments.
- o School-based assessment.
- o Examination reforms.
- o To begin with, PARAKH will work on bringing an equivalence in the recognised school boards in India in terms of the academic standards among learners.
- PARAKH will closely work with the state directorates of education, state education boards and international organisations working in the area of assessment and evaluation.
- PARAKH will also be responsible for conducting large-scale assessments, including the National Achievement Survey (NAS).
- The next NAS in 2024 will be conducted by PARAKH. It will also guide the State Achievement Survey (SAS), and monitor achievement of learning outcomes in the country.
- The Centre will also manage India's participation in international assessments such as the Programme for International Student Assessment (PISA), Trends in International Mathematics and Science Study (TIMSS), and Progress in International Reading Literacy Study (PIRLS).



TRANSFORM IAS
Transforming Lives with Education