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NOVEMBER MONTH

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SECTOR 25 CHANDIGARH

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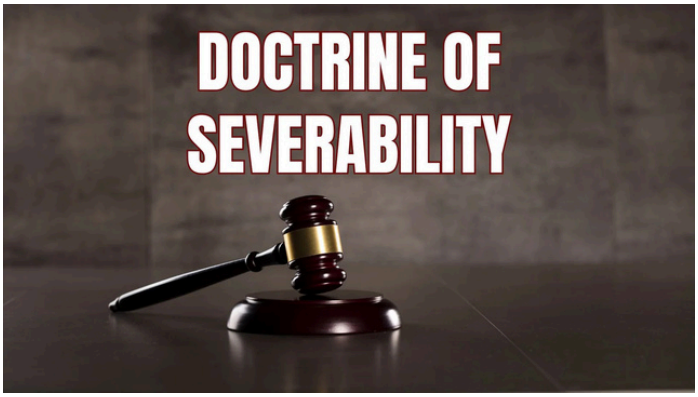
Doctrine of Party Autonomy

The Supreme Court recently held that the Doctrine of Party Autonomy is not limitless, and the same is the bedrock of arbitration.

About Doctrine of Party Autonomy

- The fundamental principle governing arbitration is party autonomy.
- The freedom of the parties to choose the process of resolving disputes is known as party autonomy.
- It confers on the parties the freedom to determine laws, place of arbitration, selection of arbitrators, etc.
- Almost all international arbitration laws, rules, and conventions recognize the principle of party autonomy.
- The concept is recognised under the New York Convention, the UNCITRAL Model Law, the Indian Arbitration and Conciliation Act, 1996, the International Chamber of Commerce (ICC) Arbitration Rules, etc.
- However, party autonomy is not unlimited, and it may be subject to certain legal or public policy constraints depending on the jurisdictions involved.
- The Supreme Court of India (SC), in the April 2021 judgment, ruled that “Party autonomy is the guiding spirit of arbitration”.
- The SC also held that such autonomy must be exercised on an equal footing, with both parties having a meaningful participation in the arbitrator appointment process.
- Any imbalance, where one party has disproportionate control, risks undermining the arbitrator’s independence and impartiality.

Doctrine of Severability



The Supreme Court clarified that the Doctrine of Severability is applicable in Suits for Specific Performance, but only in exceptional cases.

About Doctrine of Severability

- It is a fundamental legal principle that plays a crucial role in addressing the constitutionality of laws when some provisions are inconsistent with the Fundamental Rights guaranteed by the Constitution.
- In such cases, only the conflicting or repugnant part of the law will be considered void by the courts, not the entire statute.
- In simpler terms, if a specific part of a law violates the Constitution but can be separated from the rest of the law without affecting its functionality, only that problematic part will be removed, not the entire law.
- Another aspect of the doctrine of severability is that if a law combines good and bad provisions using words like 'and' or 'or,' and the enforcement of the good provision does not depend on the bad one, they are considered severable.
- The good provision will be upheld and enforced even if the bad one cannot or does not exist.
- On the other hand, if there's a provision that can be used for both legal and illegal purposes, it is invalid and cannot be allowed even for legal purposes.
- The court will declare the entire Act as void if the valid and invalid portions are so intertwined that they cannot be separated.
- It is also called the doctrine of separability.

Landmark Cases on Doctrine of Severability

- A.K Gopalan vs State of Madras: The court held that if the preventive detention provision (section 14) was removed, the rest of the Act would remain valid and effective. The violative part was separable from the valid part.
- Minerva Mills vs Union of India: The court struck down section 4 of 55 of the 42nd Amendment Act, 1976, as it exceeded the amending power of Parliament. However, the remaining provisions of the Act were upheld and considered valid.
- Kihoto Hollohan vs Zachillhu: The court declared paragraph 7 of the Tenth Schedule (inserted by the 52nd Amendment Act of 1985) unconstitutional. However, the rest of the Tenth Schedule, excluding paragraph 7, was upheld and considered constitutional.

India's $30 Trillion GDP Goal

At the Berlin Global Dialogue, Commerce Minister Piyush Goyal projected India to become a $30 trillion economy in 20–25 years, highlighting its rising confidence to pursue trade deals from a position of strength.

GDP Definition:
- Gross Domestic Product (GDP) = total value of goods & services produced within a country annually.
- Indicates a nation's economic strength and global influence.

India vs. US (2024 Data):
- US GDP: $29.2 trillion
- India GDP (2023–24): $3.9 trillion
- California's GDP alone: $4.1 trillion

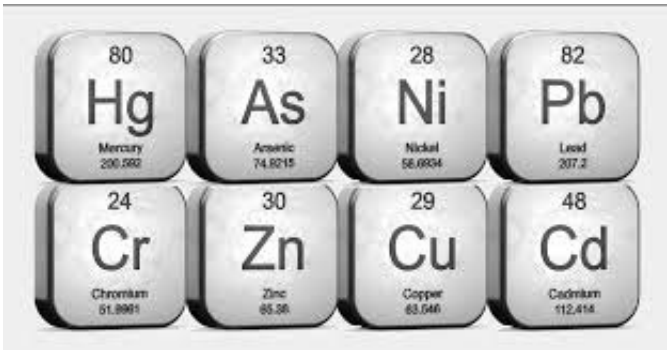
GDP Comparison Method:
- Expressed in US dollars for global comparison.
- Formula: GDP in rupees ÷ exchange rate (₹ per USD).
- Example: ₹330 trillion GDP → $5 trillion at ₹65/$, but only $3.9 trillion at ₹84/$.

Growth & Currency Trends (2000–2024):
- Nominal GDP growth (CAGR): 11.9%
- Rupee depreciation: 2.7%
- → If trend continues, India could reach $30 trillion by ~2048.

Recent Slowdown (2014–2024):
- GDP growth: 10.3%
- Rupee depreciation: 3.1%
- → At this pace, target delayed to ~2055.

Key Insight:
- Even a small dip in growth greatly impacts long-term GDP size.
- Sustained high growth and stable currency are vital to achieve the $30 trillion goal.

Heavy Metals



Heavy metals are polluting the Cauvery River and its fish, researchers from Tamil Nadu have reported.

About Heavy Metals

- The term ‘heavy metal' refers to any metallic chemical element that has a relatively high density and is toxic or poisonous at low concentrations.
- Examples of heavy metals include mercury (Hg), cadmium (Cd), arsenic (As), chromium (Cr), thallium (Tl), and lead (Pb).
- Heavy metals are natural components of the Earth's crust. They cannot be degraded or destroyed.
- To a small extent they enter our bodies via food, drinking water, and air.
- As trace elements, some heavy metals (e.g. copper, selenium, and zinc) are essential to maintain the metabolism of the human body.
- However, at higher concentrations they can lead to poisoning.
- Heavy metal poisoning could result, for instance, from drinking-water contamination (e.g. lead pipes), high ambient air concentrations near emission sources, or intake via the food chain.
- Heavy metals are dangerous because they tend to bioaccumulate.
    - Bioaccumulation means an increase in the concentration of a chemical in a biological organism over time, compared to the chemical's concentration in the environment.
    - Compounds accumulate in living things any time they are taken up and stored faster than they are broken down (metabolized) or excreted.
- Heavy metals can enter a water supply by industrial and consumer waste, or even from acidic rain breaking down soils and releasing heavy metals into streams, lakes, rivers, and groundwater.
- Mercury, lead, and cadmium are of greatest concern because of their ability to travel long distances in the atmosphere.

Nidhi Companies

About Nidhi Companies:

- A NIDHI Company is recognised under Section 406 of the Companies Act2013 and typically operates in the Non-Banking Financing Sector of India.
- It is formed to borrow and lend money to its members. It inculcates the habit of saving among its members and works on the principle of mutual benefit.
- It isn't required to receive the license from Reserve Bank of India (RBI), as these are registered with the companies act.
- Members: Minimum of seven members is required to start a Nidhi Company out of which three members must be the directors of the company.
- Activities Prohibited in a Nidhi Company
  - It can't deal with chit funds, hire-purchase finance, leasing finance, insurance or securities business.
  - It is strictly prohibited from accepting deposits from or lending funds to, any other person except members.
  - Nidhi companies should not issue preference shares, debentures or any other debt instrument in any manner, name or form.
  - Nidhi companies should not open current accounts with their members.

Financial Sector Assessment Report

The latest Financial Sector Assessment (FSA) report has stated that India is achieving its vision to become a $30 trillion economy by 2047.

About Financial Sector Assessment (FSA) Report

- It was published by the World Bank.

Key Highlights of the Report

- India's financial system has become more resilient, diversified, and inclusive.
- It acknowledges that financial sector reforms helped India recover from various distress episodes of the 2010s as well as the pandemic.
- India's 'world class' digital public infrastructure and government programmes have significantly improved access to a wider range of financial services for men and women.
- WB welcomed the scale-based regulation for NBFCs which recognises the different needs of this diverse industry.
- India's capital markets (equity, government bonds and corporate bonds) have increased from 144 percent to about 175 percent of GDP since the last Financial Sector Assessment Program.

What is the Financial Sector Assessment Program?

- It is a joint program of the International Monetary Fund (IMF) and World Bank established in 1999.
- It is a comprehensive and in-depth assessment of a country's financial sector.
- FSAPs in advanced economies are conducted with a focus on assessing the resilience of the financial sector, the quality of the regulatory and supervisory framework, and the capacity to manage and resolve financial crises.

Neodymium

India is planning to increase its neodymium production by nine times, reaching 500 tons by the end of FY27.

About Neodymium

- Neodymium is a chemical element with symbol Nd and atomic number 60.
- It belongs to the lanthanides group, part of the rare earth elements.
- It was discovered in Vienna in 1885 by Karl Auer.
- It is the second most abundant of the rare-earth elements (after cerium).
- Source: It is found in minerals that include all lanthanide minerals, such as monazite and bastnasite.
- Its deposits are mainly in Brazil, China, USA, India, Sri Lanka and Australia.

Properties of Neodymium

- It is a ductile and malleable silvery white metal.
- It oxidizes readily in air to form an oxide, Nd_2O_3, which easily spalls, exposing the metal to further oxidation.
- The metal must be stored sealed in a plastic covering or kept in vacuum or in an inert atmosphere.
- It reacts gradually with mineral acids—except hydrofluoric acid (HF), in which it forms a protective layer of trifluoride, NdF_3.

Applications of Neodymium

- It is a critical element in the global rare-earth magnet industry.
- It plays a key role in electric vehicles, clean energy technologies, and defense systems.
- It is suitable for use in optical devices and electrical applications.

Ayni Air Base

India has rounded off its operation at the strategic Ayni Air Base in Tajikistan after helping it run since 2002.

About Ayni Air Base

- It is located in Tajikistan.
- It is the first overseas military facility operated by India.
- Located just west of Dushanbe, the capital of Tajikistan, the base had been a neglected Soviet-era facility before India stepped in to modernize it.
- India began developing the Ayni airbase in the early 2000s under an agreement with Tajikistan.
- India invested close to $100 million in the development and modernization of the airbase.
- It extended the runway to 3,200 metres and upgraded facilities for refuelling, repairs, and hangars.
- At times, India even stationed around 200 personnel from the army and air force at the site.
- India temporarily deployed Su-30MKI fighter jets and helicopters to the base roughly a decade ago.
- India withdrew from the airbase after a bilateral agreement on stationing Indian personnel at the location ended in 2022.

Why the Ayni Air BaseMattered for India?

- The base enabled India to maintain contact with anti-Taliban forces before 2001 and later provided a route for humanitarian aid to Afghanistan.
- Ayni's location gave India a unique advantage. The base is just about 20 kilometres from Afghanistan's Wakhan Corridor, which borders Pakistan-occupied Kashmir (PoK).
- From there, Indian forces could theoretically target key Pakistani cities such as Peshawar.
- Ayni served as a gateway for India to enhance its presence in Central Asia, a region traditionally dominated by Russia and increasingly influenced by China.
- The airbase was also used in 2021 to evacuate Indian nationals and officials from Afghanistan after the Taliban takeover.

India Signs 10-Year Defence Framework with the U.S

India and the U.S. have signed a 10-year Framework for the Major Defence Partnership, marking a new phase in their strategic ties. The pact was concluded during the 12th ADMM-Plus meeting in Kuala Lumpur.

Background

- India–U.S. defence ties have deepened over two decades, beginning with the 2005 Defence Framework Agreement (renewed in 2015).
- Major enabling pacts:
  - LEMOA (2016): Reciprocal logistics access.
  - COMCASA (2018): Secure military communications.
  - BECA (2020): Geospatial and mapping data sharing.
  - SOSA (2024): Defence supply chain security.
- The 2025 Framework for the Major Defence Partnership extends cooperation for another decade.

Key Highlights of the 10-Year Framework

- Policy Roadmap: Institutionalises collaboration in military, industrial, and technological sectors.
- Technology Partnership: Focus on co-production, co-development, and indigenous defence manufacturing under Make in India.
- Information Sharing: Enhanced coordination on intelligence, cyber, and maritime security.
- Joint Exercises: Expansion of exercises like Yudh Abhyas, Malabar, and Tiger Triumph.
- Indo-Pacific Focus: Promotes a free, open, and rules-based regional order.

Strategic Significance

- Strengthens India's role as a net security provider in the Indo-Pacific.
- Facilitates U.S. technology transfer and industrial tie-ups under iCET.
- Diversifies defence supply chains, reducing import dependence.
- Demonstrates strategic resilience despite ongoing trade frictions.
- Enhances Quad coordination and supports U.S. integrated deterrence in Asia.

UNESCO's Creative Cities Network

Recently, Lucknow has officially joined the UNESCO Creative Cities Network (UCCN) under the Gastronomy category during the 43rd Session of the UNESCO General Conference.

About UNESCO Creative Cities Network

- It was created in 2004 to promote cooperation among cities that have identified creativity as a strategic factor for sustainable urban development.
- It was launched to promote UNESCO's goals of cultural diversity and strengthen resilience to threats such as climate change, rising inequality, and rapid urbanisation.
- The network covers seven creative fields: crafts and folk arts, media arts, film, design, gastronomy, literature and music.
- Aim of UCCN: The network is aimed at leveraging the creative, social, and economic potential of cultural industries.
- Indian Cities in the UCCN: Kozhikode (Literature) and Gwalior (Music) Jaipur (Crafts and Folk Arts), Varanasi (Music), Chennai (Music), Mumbai (Film), Hyderabad (Gastronomy), Lucknow (Gastronomy), and Srinagar (Crafts and Folk Arts).

Objectives of the UCCN

- It allows member cities to recognise creativity as an essential component of urban development, notably through partnerships involving the public and private sectors and civil society.
- It envisages developing hubs of creativity, innovation and broadening opportunities for creators and professionals in the cultural sector.
- These cities have to achieve the UN agenda of sustainable development.

Key Facts about Nigeria

The US President has ordered the Department of War to prepare for possible military action in Nigeria.

About Nigeria

- Location: It is a country located on the western coast of Africa. It is often called the “Giant of Africa.”
- Boundaries: It is bordered to the north by Niger, to the east by Chad and Cameroon, and to the west by Benin. It also has a coastline on the Gulf of Guinea.
- It is also Africa’s most populous country.
- Capital: Abuja

Geographical Features of Nigeria

- Climate: Nigeria has a diverse geography, with climates ranging from arid to humid equatorial.
- Drainage: The major drainage areas in Nigeria are the Niger-Benue basin, the Lake Chad basin, and the Gulf of Guinea basin.
- River: The Niger River, for which the country is named, and the Benue, its largest tributary, are the principal rivers.
- Major Mountain Range: Cameroonian Highlands
- Natural Resources: It has abundant natural resources, notably large deposits of petroleum and natural gas.

Second World Summit for Social Development 2025

The Minister for Labour & Employment is representing India at the World Summit for Social Development (WSSD-2) held in Doha, Qatar.

About Second World Summit for Social Development 2025

- It is a United Nations convened summit which reaffirms to eradicate poverty, promote full and productive employment and decent work for all, and foster social inclusion.
- It is designed to align with other recent global processes, such as the 2023 SDG Summit Political Declaration, the Pact of the Future and the forthcoming Fourth International Conference on Financing for Development (FfD4).
- History: The first World Summit for Social Development was held in Copenhagen in March 1995.
- The second World Summit for Social Development is held in Doha, Qatar.

Main Objectives of Second World Summit for Social Development 2025

- Global solidarity and accelerate action on social development by assessing progress, addressing gaps.
- Strengthening implementation of the 2030 Agenda for Sustainable Development and the Sustainable Development Goals.
- Reaffirm the 10 Commitments of the Copenhagen
- Declaration
- Promote equality, inclusion, and well-being for all
- Strengthen global solidarity and cooperation

Tanzania

Tanzanian President Samia Suluhu Hassan played down days of bloody protest as she was inaugurated recently, with an internet blackout still in place as the opposition says hundreds were killed.

About Tanzania

- It is an East African country situated just south of the Equator.
- It encompasses an area of approximately 945,087 sq.km.
- Bordering Countries:
  - It shares borders with eight countries: Kenya and Uganda to the north, Rwanda, Burundi, and the Democratic Republic of the Congo to the west, and Zambia, Malawi, and Mozambique to the south.
  - The eastern border of Tanzania meets the Indian Ocean.
- Capital: Dar es Salaam (administrative captial), Dodoma (legislative capital).
- The separate states of Tanganyika and Zanzibar gained independence from Britain in the early 1960s and merged to form the United Republic of Tanzania in 1964.
- Form of Government: Presidential Republic
- Official Language: Kiswahili or Swahili, English
- Currency: Tanzanian shilling
- Climate type: Tropical, with a long dry season and two rainy seasons.
- Major lakes: Lake Victoria (the world's second-largest freshwater lake, shared with Uganda and Kenya) in the north, Lake Tanganyika in the west, and Lake Nyasa in the southwest.
- Highest Peak: Mount Kilimanjaro – Highest in Africa, and a dormant volcano
- Major rivers: Several rivers course through Tanzania, including the Great Ruaha, Rufiji, and Kagera rivers.
- Islands:
  - The country also includes a number of major islands and archipelagos.
  - The most significant are Zanzibar, Pemba, and Mafia, all located off the eastern coast in the Indian Ocean.

UN Water Convention

Bangladesh became the first country in South Asia to join the U.N.'s Water Convention earlier.

About UN Water Convention

- It is also known as the Convention on the Protection and Use of Transboundary Watercourses and International Lakes which was adopted in Helsinki in 1992 and entered into force in 1996.

History of UN Water Convention

- It was originally negotiated as a regional framework for the pan-European region.
- Following an amendment procedure, since March 2016 all UN Member States can accede to it.

Features of UN Water Convention

- It is a unique legally binding instrument promoting the sustainable management of shared water resources, the implementation of the Sustainable Development Goals, the prevention of conflicts, and the promotion of peace and regional integration.
- It requires Parties to prevent, control and reduce transboundary impact, use transboundary waters in a reasonable and equitable way and ensure their sustainable management.
- Parties bordering the same transboundary waters have to cooperate by entering into specific agreements and establishing joint bodies.
- As a framework agreement, the Convention does not replace bilateral and multilateral agreements for specific basins or aquifers; instead, it fosters their establishment and implementation, as well as further development.
- The United Nations Economic Commission for Europe (UNECE), which services the UN Water Convention.
- Significance: It is a powerful tool to promote and operationalize the achievement of the 2030 Agenda for Sustainable Development and its SDGs.

Key Facts about Peru

Recently, the 9th round of India-Peru trade agreement was successfully concluded in Peru.

About Peru

- Location: It is situated just to the south of the Equator in South America.
- It is the third largest country in South America, after Brazil and Argentina.
- Bordering Countries: Ecuador (North), Brazil (East), Bolivia (Southeast) and Chile (South)
- Bordering Ocean: Its western border lies along the Pacific Ocean.
- Capital City: Lima

Geographical Features of Peru

- It is characterized by three major regions: the Costa, Sierra, and Amazonia.
- The Costa is an arid coastal strip along the Pacific Ocean.
- The Sierra consists of the Andes Mountains, which run through the center of the country.
- The Andes are divided into three main ranges: the Cordilleras Occidental, Central, and Oriental.
- Highest Peak: Mount Huascarán (6,768 m)
- Rivers: Amazon, Ucayali, Madre de Dios
- Lakes: Lake Titicaca (world's highest navigable lake), which Peru shares with Bolivia.
- Climate: It varies from tropical in east to dry desert in west; temperate to frigid in the Andes.
- Natural Resources: Copper, silver, Gold, Petroleum, timber, Iron ore, coal, Phosphate, potash, natural gas.

Key Facts about Denmark

Recently, Denmark's government announced a political agreement to ban access to social media for anyone aged under 15.

About Denmark

- Location: It is located in north central Europe and it is part of the Scandinavian countries.
- It also encompasses the Faroe Islands and the island of Greenland, both located in the North Atlantic Ocean.
- Bordering Country: It shares a land border with Germany in the south.
- Water bodies: It is surrounded by bodies of water including the Baltic Sea, North Sea, Kattegat Bay and Kiel Bay.
- Capital City: Copenhagen

Geographical Features of Denmark

- Topography: The most part Denmark consists of flat lands with very little elevation, except for the hilly central area on the Jutland Peninsula.
- Denmark occupies the Jutland Peninsula and an archipelago of more than 443 islands
- The coastline of Denmark is indented by many fjords, with LimFjord (in the north) the largest.
- Climate: It is moderated by the warm Gulf Stream and is therefore milder than surrounding Scandinavian countries.
- Rivers: The most significant include the Guden (longest river), Odense and Skjern.
- Natural resources: Petroleum, natural gas, fish, salt, limestone, chalk stone.

UNFCCC

The world has gathered at the city of Belem in the Brazilian state of Para for the 30th Conference of the Parties (COP30) to the United Nations Framework Convention on Climate Change (UNFCCC).

United Nations Climate Change
Global Climate Action

About United Nations Framework Convention on Climate Change

- UNFCCC is the principal global treaty for coordinating international responses to climate change.
- It provides the foundation for subsequent legal instruments, including the Kyoto Protocol and the landmark Paris Agreement.
- The purpose of the UNFCCC is to harness international cooperation to limit the rise of average global temperatures to minimize the impacts of climate change to enable timely adaptation, avoid threats to food production, and ensure sustainable economic development.
- It is one of three conventions that was adopted at the Rio Earth Summit in 1992 to promote a sustainable planet for future generations.
- Its sister Rio Conventions are the UN Convention on Biological Diversity and the Convention to Combat Desertification.
- The UNFCCC has 198 Parties, comprising 197 States and the European Union, making it one of the most widely ratified international treaties.
- Every year, parties to the Convention meet in Conference of the Parties (COPs), as well as in technical meetings throughout the year, to advance the aims and ambitions of the Paris Agreement and achieve progress in its implementation.
- The UNFCCC relies on the scientific assessments of the Intergovernmental Panel on Climate Change (IPCC) to inform its decisions and guide negotiations.
  - The IPCC is the United Nations body for assessing the science related to climate change.
  - It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988.

What is the Kyoto Protocol?

- Adopted in 1997 as part of the UNFCCC, the Kyoto Protocol outlines individual quantitative emission reduction targets for developed countries.
- The Protocol required these countries to reduce their emissions by 5% in 2008-2012 compared to 1990 levels.
- One of the key elements of the Protocol was the implementation of market mechanisms to achieve these commitments.
- These include the Clean Development Mechanism (CDM), allowing the development of cost-effective projects to reduce greenhouse gas (GHG) emissions, ensuring mitigation benefits, and creating sustainable economic benefits.

What is the Paris Agreement?

- The Paris Agreement, adopted in December 2015 at the 21st Conference of the Parties (COP21), highlighted the key role of the Framework Convention (UNFCCC) that it is connected to.
- The Agreement stresses the principles of the UNFCCC and introduces three goals:
  - to keep the global temperature increase well below 2°C, with efforts to limit it to 1.5°C;
  - to strengthen adaptation and resilience capacities; and
  - to align financial flows with the other goals of the Agreement.
- The Paris Agreement also innovated by requiring all countries, both developed and developing, to regularly submit "Nationally Determined Contributions" (NDCs).
- In the NDCs, each country explains what actions it intends to take to respond to climate change. The implementation of these actions will be accompanied by an enhanced transparency regime.
- As NDCs are defined by each country, they respect the national reality and sovereignty of each nation.

Angola

Recently, the President of India is on a four-day state visit to Angola, the first by an Indian President.

About Angola

- Location: It is located on the southwestern Atlantic Coast of Africa.
- Bordering Countries: It is bordered by the Republic of the Congo (Northwest), Democratic Republic of the Congo (North & Northeast), Zambia (Southeast) and Namibia (South)
- Maritime Boundary: It shares a border with the Atlantic Ocean.
- Capital City: Luanda

Geographical Features of Angola

- Major rivers: Cuango River and Cuanza River, vital for hydropower and inland water transport.
- Water Falls: The largest is the Calandula Waterfalls (also known as the Kalandula Falls) on the Lucala River.
- Highest peak: Mount Moco, the tallest mountain in Angola.
- Climate: It has a tropical climate with a marked dry season. The climate is largely affected by the northward flow of the cold Benguela Current off the coast, and elevation.
- Natural Resources: Petroleum, diamonds, iron ore, phosphates, copper, feldspar, gold, bauxite, uranium.

Key Facts about Oman

Recently, Oman has secured a seat on the International Coordinating Council of UNESCO's Man and the Biosphere (MAB) Programme.

About Oman

- Location: It is located in the Arabian Peninsula of Western Asia.
- Bordering Countries: It shares a north western border with the United Arab Emirates (UAE); a western border with Saudi Arabia and Yemen.
- Maritime Boundaries: It shares coastline borders with the Arabian Sea in the south and east along with the Gulf of Oman in the northeast.
- It is strategically situated at the mouth of the Persian Gulf in the south eastern part of the Arabian Peninsula.
- Capital City: Muscat

Geographical Features of Oman

- Highest Point: Mount Shams, the country's highest point at 9,777 feet.
- Climate: It consists of dry desert; hot, humid along coast; hot, dry interior; strong southwest summer monsoon (May to September) in far south.
- Ports: The Port of Salalah is the largest port in Oman.
- Desert: The Rub' al-Khali desert, shared with Saudi Arabia and Yemen.
- Natural Resources: Petroleum, copper, asbestos, some marble, limestone, chromium, gypsum, natural gas.
- It also has offshore territories such as Maşīrah Island and Al-Ḩallāniyyah Island.

Key Facts about Botswana

Recently, India and Botswana formally announced the translocation of eight Cheetahs from the African nation during the State visit of the President of India.

About Botswana

- It is a landlocked country located in the center of Southern Africa.
- Bordering Countries: It is bordered by four countries - Namibia to the north and west, South Africa to the south and southeast, Zimbabwe to the northeast, and it also borders Zambia to the north.
- Botswana is a member of the United Nations, the Commonwealth, the African Union, and the Southern African Development Community.
- Capital City: Gaborone

Geographical Features of Botswana

- The country is divided into three main environmental regions.
- Hardveld Region: It consists of rocky hill ranges and areas of shallow sand cover in eastern Botswana.
- Sandveld Region: It is the area of deep Kalahari sand covering the rest of the country.
- Ancient lake beds: It is superimposed on the northern sandveld in the lowest part of the Kalahari Basin.
- Major Rivers: The main rivers in Botswana are Okavango, Chobe, Limpopo and Molopo.
- Okavango Delta is one of a very few large inland delta systems without an outlet to the sea, known as an endorheic delta.
- Desert: The massive Kalahari Desert covers more than 70 percent of Botswana.
- Climate: It consists of semiarid; warm winters and hot summers
- Natural Resources: Diamonds, copper, nickel, salt, soda ash, potash, coal, iron ore, silver

Strait of Hormuz

Iran seized a Marshall Islands-flagged oil tanker as it travelled through the narrow Strait of Hormuz recently, turning the ship into Iranian territorial waters in the first such interdiction in months in the strategic waterway.

About Strait of Hormuz

- It is a narrow waterway between Iran and the Arabian Peninsula, specifically the United Arab Emirates, and Musandam (Oman).
- The Gulf of Oman is on the strait's east, while the Persian Gulf is on the west.
- It is the only sea channel linking the oil-rich Persian Gulf (west) with the Gulf of Oman and the Arabian Sea (southeast).
- Iran is located on the north coast, while the UAE is on the south coast.
- The strait is 167 kilometers long.
- At its narrowest point, the Strait of Hormuz is only 29 nautical miles wide (54 km).
- The strait consists of 2-mile-wide navigable channels (3 km) for inbound and outbound shipping as well as a 2-mile-wide buffer zone.
- Some of the islands located in the Strait of Hormuz are Hengam, Hormuz, and Qishm.
- The Strait of Hormuz is considered one of the world's most economically important choke points.
- About 30% of the world's liquefied gas and 25% of oil pass through the Strait of Hormuz.

Senkakau Islands

Recently, a China Coast Guard ship formation passed through the disputed waters of the Senkaku Islands.

About Senkaku Islands

- Location: These are an uninhabited group of islands situated in the East China Sea.
- The islands comprise Uotsuri Island, Kuba Island, Taisho Island Kitakojima Island, Minamikojima Island, Tobise Island, Okinokitaiwa Island, and Okinominamiiwa Island.
- The total land area of all the islands is roughly 6.3 square kilometers.

Features of Senkaku Islands

- This island consists of conglomerate sandstone (alternate layers of sandstone and conglomerate in some parts), tuff, andesite, andesitic lava, coral outcroppings elevated above sea level during the Holocene era, and other rocky material.
- The surrounding area is highly volcanic and features faults associa ted with this volcanic activity, and this affects land formation.
- Dispute: The Senkaku Islands (called the Diaoyu Islands by China) have long been disputed between China and Japan.
- Administration of Senkaku Islands: Currently, Japan administers and controls the Senkaku Islands as part of the city of Ishigaki in Okinawa Prefecture.

United Nations Convention Against Cybercrime

Recently, the Supreme Court asked the Centre to take a call on ratifying the United Nations Convention against Cybercrime.

About United Nations Convention Against Cybercrime

- It was adopted by member states of the UN General Assembly (UNGA) in December 2024 to strengthen global cooperation in combating cybercrime.
- Purpose: To promote international cooperation, strengthen measures to prevent and combat cybercrime, and support capacity-building, particularly for developing countries.
- It will enter into force 90 days after the 40th State deposits its ratification.
- India has not signed this treaty yet.
- It is the first universal legally binding instrument to strengthen collective defences against cybercrime.
- The convention was developed by the UN Office on Drugs and Crime (UNODC).

Key Provisions of United Nations Convention Against Cybercrime

- It sets legal standards for addressing offenses such as illegal access, cyber fraud, and online child exploitation, while ensuring human rights and data privacy.
- It provides States with a range of measures to be undertaken to prevent and combat cybercrime.
- It facilitates the sharing of electronic evidence across borders and establishes a 24/7 cooperation network among States.
- It recognises the non-consensual dissemination of intimate images as an offence.
- It covers crimes such as hacking, ransomware, online financial fraud, illegal interception, money laundering,
- It applies not only to cyber offences but also to the collection and sharing of electronic evidence in serious crimes.

Negros Island

An earthquake measuring 5.8 in magnitude struck Negros Island, Philippines, recently.

About Negros Island

- It is one of the Visayan Islands, central Philippines.
- It is the fourth largest and third most populous island in the Philippines.
- It is a boot-shaped island that is 217 km long and 35 to 79 km wide.
- It is separated from the island of Panay to the northwest by the Guimaras Strait and from Cebu Island to the east by the Tanon Strait.
- The island is bordered on the north and south by the Visayan and Sulu seas, respectively.
- A central mountain range runs through the entire island and is deeply dissected by erosion.
- The range contains Mount Canlaon, an active volcano that at 8,086 feet (2,465 metres) is the highest point in Negros.
- This island has a rugged mountain interior, underwater coral gardens, and beautiful beaches.
- The island's major rivers are the Binalbagan, Ilog, Tolong, and Tanjay.
- It is famed for its rich marine biodiversity and as the nation's "Sugar Capital."

Volcanic Lightning

Volcanoes are incredible but highly dangerous natural phenomena and they also have the power to create lightning.

About Volcanic Lightning

- It is a mysterious and powerful phenomenon that occurs during volcanic eruptions rather than thunderstorms.
- It is in the form of a powerful barrage of lightning which occurs at the early stages of a volcanic eruption.
- Cause: The main cause is the collision between ash particles within the volcanic plume.
- The collision and rubbing of these particles together lead to the generation of static electricity, which, in turn, builds up charges and creates flashes of lightning.
- This type of lightning can be found in two places
- At the dense ash clouds located closer to the ground.
- Higher up in the eruption plume where ice particles form (from water vapourised from the magma) and collide, building electric charges and creating lightning visible strikes at higher levels.
- The water content found in volcanic plumes is higher than that in thunderstorms.

Previous Volcanic Lightning

- The earliest was made by Pliny the Younger who described it during Mount Vesuvius eruption in Italy in 79 AD.
- Italian physicist Luigi Palmieri also recorded this phenomenon between 1858 and 1872.

Tungsten

Recently, the Hindustan Zinc Ltd (HZL) has received the licence to explore and mine a tungsten block in Andhra Pradesh.

About Tungsten

- It is a chemical element with the symbol W, and atomic number 74.
- It is a naturally occurring element and classified as a transition metal.
- Major producers: China (major global producer), Vietnam, Russia, and North Korea.
- It has been classified as a Critical Mineral by the Government of India.

Occurrence of Tungsten

- It occurs in rocks and minerals combined with other chemicals, but never as a pure metal.
- It is found in nature in mineral forms like wolframite and scheelite.

Properties of Tungsten

- It has the highest melting point of all metals at 3410 °C.
- It has the lowest vapor pressure of all metals with 4.27 Pa at 3410 °C.
- It has the highest tensile strength of all metals over 1650 °C.
- Tungsten is a solid at room temperature.
- Tungsten alloys tend to be strong and flexible, resist wear, and conduct electricity well.

Uses of Tungsten

- Tungsten is used in products such as x-ray tubes, light bulbs, high-speed tools, and welding electrodes.
- It is also used as a catalyst to speed up chemical reactions.
- Tungsten carbide is immensely hard and is very important to the metal-working, mining and petroleum industries.
- Other tungsten compounds are used in ceramic pigments, as fire retardant coatings for fabrics, and as color-resistant dyes for fabrics.

Siliguri Corridor

Amid shifting regional dynamics following the change of regime in Bangladesh and concerns over China's growing presence near the vulnerable Siliguri corridor, the Indian Army has reinforced its eastern frontier by establishing three new garrison locations.

]About Siliguri Corridor

- It is a narrow stretch of land in West Bengal that connects India's mainland to its northeastern states.
- It is around 170 km long and 60 km in width, with its narrowest section being just 20-22 km.
- Overall, it is 12,200 sq.km. in area.
- This corridor shares its border with Nepal, Bhutan, and Bangladesh and is only 130 km away from China's Chumbi Valley.
- Its geographical fragility and criticality have earned it the nickname "Chicken's Neck" in strategic and military circles.
- It is the only land link between our Northeast region and the rest of the country.
- Any disruption in this corridor — be it from military conflict, natural disaster, or internal unrest — would sever India's northeastern states from the rest of the country.

Integrated Forum on Climate Change and Trade

Recently, the 30th Conference of the Parties (COP30) to the United Nations Framework Convention on Climate Change formally launched an integrated forum on Climate Change and Trade (IFCCT).

About Integrated Forum on Climate Change and Trade

- It is a politically supported forum where countries can address the increasingly contentious intersection between trade policies and climate action.
- Launched at: It was launched at COP30, Belém (Brazil), on 15 November 2025.
- It bridges divides between climate ambition and trade policy and help developing countries gain a stronger voice in shaping emerging trade rules.
- It will be co-chaired by Brazil and a developed country partner, and open to all Parties to the UNFCCC.
- The IFCCT will be institutionally independent of both the WTO and the UNFCCC.
- The Forum will not negotiate binding outcomes or interpret existing agreements or adjudicate disputes or evaluate specific national measures

Key Features of Integrated Forum on Climate Change and Trade

- It will begin with an open-ended consultation process extending into 2026 to define topics to be discussed and the forum's jurisdiction.
- It creates an opportunity of interoperability rather than fragmentation related to climate negotiations.
- It will bring together civil society organisations, business associations, and international initiatives.

National Marine Fisheries Census 2025

Recently, the union Minister of State, Ministry of Fisheries, Animal Husbandry and Dairying, launched the Marine Fisheries Census (MFC) 2025.

About National Marine Fisheries Census 2025

- It is the fifth edition of the Marine Fisheries Census.
- It is a coast-wide activity fully funded by the Department of Fisheries, Government of India.
- Nodal Agency: ICAR-Central Marine Fisheries Research Institute (CMFRI) as the nodal agency and Fishery Survey of India (FSI) as the operational partner.

Features of National Marine Fisheries Census 2025

- Coverage: 13 coastal States and Union Territories, including the Andaman & Nicobar Islands and Lakshadweep,
- Time Period: The core household data collection is scheduled for an extended period of 45 days.
- Digital Architecture: It is powered by a suite of custom-made, multilingual Android applications—VyAS–NAV (for validation of fishing villages and harbours), VyAS–BHARAT (household and infrastructure enumeration) and VyAS–SUTRA (for real-time supervision and monitoring of households and enumerators) developed by the the ICAR–Central Marine Fisheries Research Institute (CMFRI).
- Expanded Socio-economic Data: For the first time, census includes detailed information on crucial indicators like total family income, homeownership, outstanding liabilities, and sources of credit.
- Focus on Vulnerability: It covers data on insurance status, major losses or disabilities, the specific socio-economic impacts of the COVID-19 pandemic on fisher families, and the receipt of benefits from schemes like PMMSY/PM-MKSSY.
- Institutional Mapping: New schedules focusing on Fish Farmer Producer Organizations (FFPOs) and Self-Help Groups (SHGs) are introduced to facilitate collectivization and strengthen the value chain.

Kunming Biodiversity Fund

Recently, seven countries have secured $5.8 million from the Kunming Biodiversity Fund to enhance nature-friendly agriculture.

About Kunming Biodiversity Fund

- It is a Multi-Partner Trust Fund (MTPF) launched in 2021 during Part 1 of the COP 15 of Convention of Biological Diversity.
- It aims to facilitate the successful implementation of the Kunming-Montreal Global Biodiversity Framework (KMGBF) at regional, national, subnational and local level.
- Initial contribution: 1.5 billion yuan (about $200 million) from China.
- It was established under the leadership of the Ministry of Environment and Ecology (MEE) of China and the United Nations Environment Program (UNEP), with the Secretariat of the Convention on Biological Diversity (SCBD) and United Nations Development Programme (UNDP).
- Focus area: It supports developing countries to accelerate and upscale their actions for the National Biodiversity Strategies and Action Plans (NBSAPs).

What is Kunming-Montreal Global Biodiversity Framework?

- It was adopted during the 15th meeting of the Conference of the Parties to the UN Convention on Biological Diversity in December 2022.
- It aims to support the achievement of sustainable development goals and build on previous strategic plans.
- It sets a bold path towards global harmony with nature by 2050.
- Goals and targets: The GBF consists of 23 targets (set for 2030) and four global goals (set for 2050) to preserve biodiversity for current and future generations.

Nauradehi Wildlife Sanctuary

Recently, the Madhya Pradesh Chief Minister said that Nauradehi Wildlife Sanctuary will become the third home for cheetahs in the state.

About Nauradehi Wildlife Sanctuary

- Location: It is located in the state of Madhya Pradesh.
- It was declared a wildlife sanctuary in 1975.
- It is the largest wildlife sanctuary in Madhya Pradesh.
- The entire sanctuary is situated on a plateau, forming part of the upper Vindhyan range.
- It acts as a corridor for Panna Tiger Reserve and Satpura Tiger Reserve while indirectly connecting Bandhavgarh Tiger Reserve via Rani Durgawati Wildlife Sanctuary.
- It is classified under the Deccan peninsula biogeographic region and forms part of the Ganga and Narmada basins.
- Vegetation: The forest type of this sanctuary is classified as the Tropical Dry Deciduous forest which consists of the Central Indian monsoon forests.
- Drainage: Three fourth of Nauradehi Wildlife Sanctuary falls in the Yamuna [Ganges] basin and one fourth of the sanctuary falls in the Narmada basin.
- The north flowing Kopra River, Bamner River, Bearma River, which are tributaries of the Ken River, are the major rivers of this sanctuary.
- Flora: Teak, Saja, Dhaora, Bhirra, Ber, Bel, Mahua, Tendu, Gunja and Amla etc.
- Fauna: Tiger, Panther, Sloth-beer wild dog, blue bull, chinkara, spotted deer, sambhar etc.

Stabilimenta

A new study has revealed that the mysterious silk decorations in some spider webs known as stabilimenta may be sophisticated tuning devices that enhance the spider's ability to locate its next meal by controlling how vibrations travel through the web.

About Stabilimenta

- Stabilimenta are highly UV-reflective distinctive silk structures found in multiple spider species' webs.
- These "decorations" may look like zig-zagging threads spanning the gap between two adjacent "spokes," or threads arranged in a circular "platform" around the web center.
- The purpose of stabilimenta within the web is unclear.
- They could help collect water, regulate a spider's body temperature, or even deter predatory wasps or birds to help the arachnids collect more insects.
- They also may help the spiders pinpoint where their prey is located by helping vibrations move throughout the web.
- Not all spiders use stabilimenta, and members of the same species may decorate their webs in different ways.

Water Lettuce

El Salvador's Lake Suchitlan is overwhelmed by invasive water lettuce which is impacting thousands of families dependent on fishing and tourism.

About Water Lettuce

- Water lettuce is a free-floating aquatic weed found in tropical countries worldwide, including Asia, Africa and equatorial America.
- It is also known as water cabbage, Nile cabbage, or shellflower.
- Appearance: It is a floating aquatic herb that resembles a floating head of lettuce. It has white to tan, long and feathery roots that hang beneath the rosette of leaves.
- It grows best on still or slow moving bodies of fresh water such as farm dams, reservoirs, lakes, rivers and creeks.

Why is it an Invasive Species?

- It forms dense mats that clog waterways making boating, fishing, and other water activities impossible.
- These mats also degrade water quality by blocking the air-water interface and greatly reducing oxygen levels which can result in fish die-off and the overall reduction of aquatic fauna and flora diversity.
- Impact on Environment: It affects water flow, damages native ecosystems.

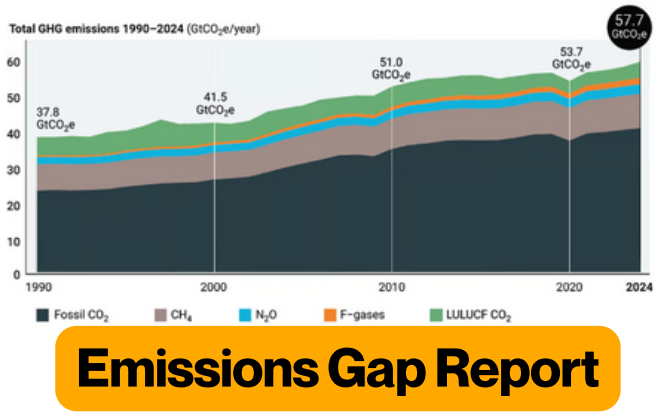
Pilia malenadu

A team of researchers exploring biodiversity in the Western Ghats recently discovered a new species of spider named Pilia malenadu.

About Pilia malenadu

- It is a new species of spider.
- It belongs to Pilia, a genus of jumping spiders.
- It was discovered in Madhugundi in the Mudigere taluk of Chikkamagaluru, Karnataka, at the foothills of the Western Ghats.
- The researchers named it “Pilia malenadu”, to give credit to the place it was found.
- The discovery is significant because the last time a species of spiders belonging to the pilia genus was discovered was about 123 years ago (1902) in Kerala.
- Further, the researchers, for the first time, have found both male and female spiders of the species.
- These spiders were found in only two plant species — Memecylon umbellatum and Memecylon malabaricum.
- In fact, the spiders were found concealed between the leaves of these plants.

Emissions Gap Report 2025



Emissions Gap Report 2025 assessment has found that updated global climate pledges have resulted in only marginal progress towards limiting global warming.

About Emissions Gap Report 2025

- Emissions Gap Report is an annual report published by the United Nations Environment Programme (UNEP).
- The EGR series tracks our progress in limiting global warming well below 2°Cand pursuing 1.5°C in line with the Paris Agreement.
- It is launched every year ahead of the UN Climate Change Conference of the Parties (COP).
- The EGR is co-produced by UNEP, the UNEP Copenhagen Climate Centre (UNEP-CCC) and partners.

Key Highlights of Emissions Gap Report 2025

- Even after countries fully implement their latest Nationally Determined Contributions (NDC) under the Paris Agreement, global temperatures are projected to rise by 2.3-2.5 degrees Celsius (°C) this century.
- Global GHG emissions rose 2.3% in 2024, reaching 57.7 gigatonnes of CO_2 equivalent.
- Only 60 Parties, covering 63% of global emissions, have submitted new NDCs for 2035.
- To align with the 1.5°C target, emissions would need to fall by 55 per cent by 2035.

Khangchendzonga National Park

The International Union for Conservation of Nature (IUCN) recently rated Khangchendzonga National Park as "good" in its latest global review of natural World Heritage sites.

About Khangchendzonga National Park

- It is located in the north of Sikkim.
- It is a part of the Khangchendzonga Biosphere Reserve (KBR).
  - KBR is India's first "mixed" UNESCO World Heritage Site, recognised in 2016 for its combination of natural beauty and cultural importance.
- It is home to Mt. Khangchendzonga, the third highest peak in the world.
- It lies entirely along the Sikkim-Nepal border.
- It is a part of the Himalaya global biodiversity hotspot.
- It encompasses an area covering 1784 sq.km.
- It exhibits one of the widest altitudinal ranges of any protected area worldwide. The park has an extraordinary vertical sweep of over 7 kilometres (1,220 m to 8,586 m).
- It has a unique diversity of plains, valleys, lakes, glaciers, and spectacular, snow-capped mountains covered with ancient forests.
- It has, in total, 18 glaciers, the largest one being Zemu Glacier, one of the largest glaciers in Asia.
- It is one of the very few places where you will find the Lepcha tribal settlements.
- Flora: Subtropical to alpine vegetation; includes oak, fir, birch, maple, and rhododendron.
- Fauna:
  - It is home to important flagship species such as the snow leopard, Tibetan wolf, red panda, blue sheep, Himalayan Tahr, and mainland serow, among many.
  - It is home to nearly half of India's bird diversity.

Black-Headed Ibis

A flock of rare White Ibis, commonly known as Black-headed Ibis, was recently sighted in the salt pan regions of Thoothukudi district, Tamil Nadu.

About Black-headed Ibis

- The black-headed ibis, also known as the Oriental white ibis, Indian white ibis, and black-necked ibis, is a species of wading bird of the ibis family Threskiornithidae.
- Scientific Name: Threskiornis melanocephalus
- These are called wader birds due to their adaptability to a wide variety of aquatic environments.

Black-headed Ibis Habitat and Distribution

- It is found in South- and Southeast Asia from India to the west and as far east as Japan.
- Found primarily around wetlands including agricultural fields and occasionally around coastal areas, but also seen foraging in dry fields and human-modified landscapes.

Black-headed Ibis Features

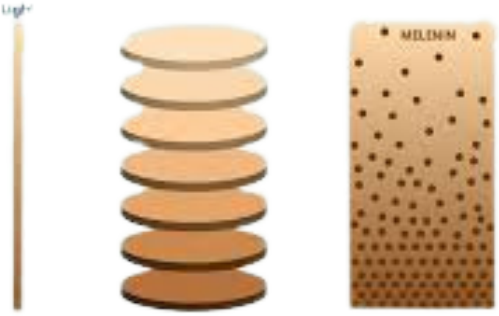
- It is a large wader bird, with adults measuring 65–76 cm in length.
- It is the only native ibis species in its range that has an overall white plumage with a black neck and head.
- Males and females look similar and both have greyish tail feathers.
- Tails of adults bear light grey ornamental feathers that turn jet black during the breeding season.

Black-Headed Ibis Conservation Status

- It is classified as 'Least Concern' under the IUCN Red List.

Melanin

Melanin tells the tale of how our ancestors survived from the Sun's heavy UV rays 50000 years back.



About Melanin

- Melanin is a natural pigment found in most living organisms.
- It is present in human and animal skin to varying degrees, and is responsible for your unique eye, hair and skin color.
- Melanin is produced within special structures called melanosomes. Melanosomes are found inside melanin-producing pigment cells called melanocytes.

Types of Melanin

- Eumelanin: It is responsible for brown and black shades of hair, skin, and eyes.
- Pheomelanin: It produces red or yellow hues — more common in people with red hair or lighter skin.
- Neuromelanin: It is found in the brain, and develops from the oxidation of dopamine (a feel good chemical) and noradrenaline (a fight-or-flight hormone)

Melanin-Related Skin Conditions

- Vitiligo: It is a condition where the skin loses its pigment-producing cells, leading to white patches.
- Albinism: It is a genetic mutation that prevents melanin production, resulting in pale skin, hair, and eyes.
- Hyperpigmentation: Excess melanin causes darker spots or patches, often due to sun exposure or hormones.

Role of Melanin

- Biological Shield: It acts as a biological shield, absorbing harmful ultraviolet rays and thereby protecting the skin from potential skin cancers like melanoma, and various carcinomas
- Camouflage and Survival: It helps animals to blend in with their environment via camouflage. This ability is very crucial for both predator and prey.
- Thermoregulation: It also helps in thermoregulation, controlling heat loss and generation through mechanisms like sweating.

Lichen

Researchers recently discovered four new lichen species, enhancing biodiversity understanding in the Western Ghats.

Why in News?

- The newly identified species – Parmotrema sahyadricum (discovered from Wayanad), Solenopsora rhizomorpha (from Eravikulam and Mathikettanshola National Parks), Buelloa ghattensis (Mathikettanshola National Park) and Pyxine janakiae (Mathikettanshola National Park) – have been published in international scientific journals.
- The work that started in 2022 resulted in these discoveries.
- The team also recorded more than 50 species of lichens, which are new reports to the Kerala part of the Western Ghats.

About Lichen

- A lichen is a symbiosis between different organisms — a fungus and an algae or cyanobacterium.
- The basis of their relationship is the mutual benefit that they provide each other.
- The photosynthetic algae or cyanobacteria form simple carbohydrates that, when excreted, are absorbed by fungi cells and transformed into a different carbohydrate.
- They also produce vitamins that the fungi need.
- Fungi contribute to the symbiosis by absorbing water vapour from the air and by providing much-needed shade for the light-sensitive algae beneath.
- The composite body of a lichen is called a thallus (plural thalli); the body is anchored to its substrate by hairlike growths called rhizines.
- Lichens are found worldwide and occur in a variety of environmental conditions.
- A diverse group of organisms, they can colonize a wide range of surfaces and are frequently found on tree bark, exposed rock, and as a part of biological soil crust.

Benefits that Lichen Give to Nature

- They are a keystone species in many ecosystems.
- They serve as a food source and habitat for many animals, such as deer, birds, and rodents.
- They provide nesting materials for birds.
- They protect trees and rocks from extreme elements such as rain, wind, and snow.
- Pioneers of Colonization:
- Lichens are considered as primary colonisers.
- These invade bare areas and contribute to soil formation by breaking down rock minerals both physically and chemically and thus creating conditions for other species such as mosses and liverworts to follow.

Crassicaulis middletonii

In a remarkable botanical breakthrough, scientists from the Botanical Survey of India (BSI) recently discovered a new flowering plant species — Crassicaulis middletonii.

About Crassicaulis middletonii

- It is a new species of flowering plant.
- It was discovered in the evergreen forests of Arunachal Pradesh's West Siang district.
- It marks the first-ever record of the genus Crassicaulis in India, extending its known range by more than 1,200 kilometres westward from China's Yunnan province.
- It belongs to the Gesneriaceae family (commonly known for ornamental species like African violets).
- It grows up to 30 cm tall and thrives along stream banks near small waterfalls at about 800 metres elevation.
- Its leaf base, white flowers tinged with pink, capsule shape, greenish ovary, and calyx distinguish it from its only known relative, Crassicaulis guiliangii, found in Yunnan.
- It has been assessed as "Critically Endangered" under the IUCN Red List criteria.

National Board for Wildlif

The Standing Committee of the National Board for Wildlife (NBWL) recently recommended 13 defence and paramilitary projects, most of them in high-altitude protected areas of Ladakh and one in Arunachal Pradesh.

About National Board for Wildlife

- It is a statutory body constituted by the Central Government in 2022 under Section 5A of the Wildlife (Protection) Act, 1972.
- NBWL is India's top-level advisory body to the government on matters pertaining to wildlife conservation, particularly within Protected Areas (PAs).
- It is responsible for guiding the government's decisions on matters related to wildlife conservation and issuing approvals for projects in PAs.

National Board for Wildlife Organisation Structure

- It is a 47-member committee, headed by the Prime Minister and the Minister of Environment, Forest, and Climate Change as vice chairperson.
- In addition to offices and institutions directly involved in conservation and protection of wildlife, the NBWL also has the chief of army staff, defence secretary, expenditure secretary to the Government of India as members.
- Further, the central government nominates 10 members who are eminent conservationists, ecologists, and environmentalists.
- The Additional Director General of Forests (WL) & Director, Wildlife Preservation is the Member-Secretary to the Board.

National Board for Wildlife Functions

- The major function of the National Board is to promote the conservation and development of wildlife and forests.
- NBWL advises both Central and State Governments on the matters of promoting wildlife conservation and protection.
- Effectively controlling poaching and illegal trade of wildlife and its products.
- Making recommendations on the setting and managing national parks, sanctuaries and other protected areas.
- NBWL carries out Environmental Impact Assessment of projects and activities on wild life or its habitat.
- Reviewing the progress in the field of wildlife conservation in the country and suggesting measures for improvement to the Government.
- Preparing and publishing a status report at least once in two years on wildlife in the country.

Standing Committee of National Board for Wildlife

- It is an independent body under NBWL.
- It comprises not more than 10 members of the NBWL.
- The Minister of Environment, Forest, and Climate Change chairs the Standing Committee.
- The difference between the standing committee and the National Board is that the Standing Committee regulates land diversion within protected areas and eco-sensitive zones, making it a purely project clearance body.
- The NBWL, on the other hand, has the power to deal with policy-level decisions on wildlife.

Climate Investment Fund

Recently, during COP 30 of UNFCCC, Germany and Spain announced a $100 million commitment for the Climate Investment Fund's (CIF) new programme called Accelerating Resilience Investments and innovations for Sustainable Economies (ARISE).

About Climate Investment Fund

- It was launched in 2008.
- It is a multilateral climate fund that enables climate action in over 70 low and middle income countries.
- Purpose: The purpose of CIF is to finance comprehensive measures for climate change mitigation and adaptation in developing and emerging economies.
- CIF deploys highly concessional finance to empower transformations in clean technology, energy access, climate resilience, nature-based solutions, and other areas.
- CIF comprises two funds: the Clean Technology Fund (CTF) and the Strategic Climate Fund (SCF).
- It is the only climate fund working exclusively through six AAA-rated multilateral development banks (MDBs) namely;
- Asian Development Bank, African Development Bank, European Bank for Reconstruction and Development, Islamic Development Bank International Finance Corporation and World Bank
- Governance: The Clean Technology Fund (CTF) Trust Fund Committee is the decision-making body responsible for determining and overseeing the operations and activities of the fund.
- In 2024, CIF became the first multilateral climate fund to list bonds on the capital markets, with the CIF Capital Markets Mechanism (CCMM).
- Secretariat: The CIF Secretariat is hosted by the World Bank.

Humboldt Penguin

Recently, Chilean scientists warned of further risks to the world's shrinking population of Humboldt penguins.

About Humboldt Penguin

- The Humboldt penguin (Spheniscus humboldti) belongs to a genus that is commonly known as the 'banded' group.
- They are so named because their habitat is located near the Humboldt Current, a large oceanic upwelling characterised by cold waters.
- Distribution: Humboldt penguins are endemic to the Pacific coasts of Chile and Peru. Chile's Pacific coast is home to 80% of the world's remaining Humboldt penguins,
- Appearance:
  - They have large, bare skin patches around their eyes, an adaptation to help keep them cool, according to the Smithsonian Institute.
  - They are a medium-sized species with an average height of just over 2 ft.
- Breeding season: Their breeding season in the wild is either March-April or September-October depending on the location of the colony.
- Humboldt penguins are monogamous and recognize their partner in the colony through distinct vocal cues.
- Threats: Competition for food from commercial fishing as well as habitat loss, pollution, bird flu and the worsening impacts of climate change have contributed to declining numbers.

Conservation Status of Humboldt Penguin

- IUCN: Vulnerable
- CITES: Appendix I

Intergenerational Equity

Supreme Court judge Justice P.S. Narasimha recently said many of the environmental law principles imported from Western countries, such as 'inter-generational equity', are anthropocentric and would hardly be of any assistance to protect an endangered species from extinction.

About Intergenerational Equity

- Intergenerational equity is a principle that emphasizes the moral obligation of the current generation to ensure that future generations have the same opportunities and resources available to them as the present generation.
- It refers to equity between generations, which includes the needs of the future generation in the design and implementation of current policies.
- Thus, intergenerational equity simply means a duty of the present generation towards future generations i.e. the present generations of human beings are obliged to take care of the natural resources and ecology so that all future generations shall also have an equal chance to enjoy mother nature and the right to life.
- It is a recognized principle of International Environmental law which provides for the preservation of natural resources for the benefit of future generations.
- The principle is strongly embedded in the United Nations (UN) Framework Convention on Climate Change.
- Historically, it owes its recognition to the Brundtland Report, Our Common Future (1987), which popularized the principle of "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."
- The Declaration of Rio on Environment and Development (1992) adds a rights-based perspective to the principle, suggesting that "the right to development must be fulfilled to equitably meet development and environmental needs of present and future generations."

Checkered Keelback

A team from the Assam State Zoo and Botanical Garden recently recorded the first case of albinism in the checkered keelback (Fowlea piscator), also called the Asian water snake, in Assam.

About Checkered Keelback

- The Checkered keelback, also known commonly as the Asiatic water snake, is a medium-sized nonvenomous snake native to Asia.
- Scientific Name: Fowlea piscator
- Distribution:
  - It is typically found in the Indian subcontinent, including India, Bangladesh, Nepal, and Sri Lanka.
  - It is found in almost all parts of India, including Uttar Pradesh, Maharashtra, Andhra Pradesh, Karnataka, Tamil Nadu, and Kerala.
- Habitat: Freshwater habitats such as ponds, marshes, and rice fields.
- Features:
  - It has a slender and elongated body, making it agile and fast.
  - The average length is around 3-4 feet, and it weighs between 200-500 grams.
  - Its body is stout and covered with keeled scales on the upper side.
  - Its colour is olive-brown, olive-green or yellow, usually with black patches.
  - Sometimes it is found in red too.
  - Its underside is off-white or light yellow.
  - Its head pointed and slightly broader than the neck.
  - Its diet mainly consists of fish, frogs, and small reptiles.
- IUCN Red List: Least Concern

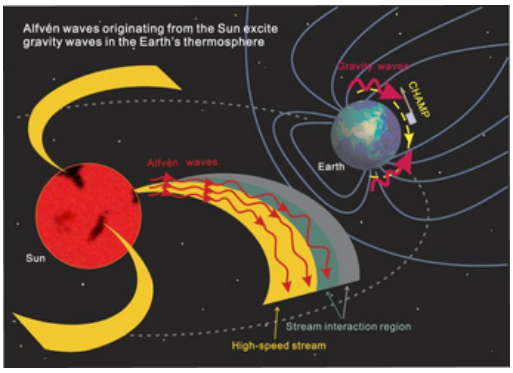
Lycodon Irwini

Researchers recently confirmed the discovery of Lycodon irwini, a glossy black wolf snake, on Great Nicobar Island.

About Lycodon Irwini

- It is a new species of snake.
- It was discovered on the remote Great Nicobar Island at the southern tip of the Nicobar Islands.
- The snake, which is a member of the Lycodon subcinctus group, was named in honour of the late Australian conservationist and television personality, Stephen Robert Irwin.
- It is a striking glossy-black wolf snake that had remained unidentified for years because it closely resembles another widespread species.
- The new research finally confirms that the Great Nicobar population represents a distinct species currently known only from the island.
- One of the most notable features of Lycodon irwini is its uniform glossy black colour, unlike close relatives that typically have white bands or patches.
- The snake is slender, nocturnal, and can grow close to 1.2 metres in length.
- The researchers also documented a higher number of belly and tail scales compared to similar species.

Alfvén Waves



Researchers have made a major advance in solar physics by capturing the first direct evidence of small-scale torsional Alfvén waves in the Sun's outer atmosphere, known as the corona.

About Alfvén Waves

- Alfven waves are low-frequency, transverse electromagnetic waves that propagate along the Sun's magnetic field lines.
- It occurs in a plasma (or conducting fluid), resulting from the interaction of the magnetic fields and electric currents within it.
- These waves were first proposed in 1942 by Nobel Prize-winning physicist Hannes Alfvén, are magnetic fluctuations that transfer energy through plasma.
- Larger and more sporadic Alfven waves linked to solar flares have been detected before.
- What Researchers have found?
- The breakthrough was made possible by the unique capabilities of the Daniel K. Inouye Solar Telescope's Cryogenic Near Infrared Spectropolarimeter (Cryo-NIRSP).
- This is the first time the subtle, ever-present twisting waves, thought to be powerful enough to heat the corona, have been directly confirmed.
- The study suggests that Alfven waves may account for at least half of the energy needed to heat the corona.

Dhvani Missile

India's Defence Research and Development Organisation (DRDO) is on the verge of a historic breakthrough with the upcoming test of Dhvani, a cutting-edge hypersonic missile that promises to catapult the nation into an elite club of military superpowers

About Dhvani Missile

- It is an hypersonic missile being developed by India's Defence Research and Development Organisation (DRDO).
- The Dhvani is being developed as a Hypersonic Glide Vehicle (HGV), a revolutionary weapon system that combines blistering speed with unprecedented maneuverability.
- Unlike conventional cruise missiles that follow predictable flight paths, the Dhvani will be launched to extreme altitudes before gliding toward its target at hypersonic speeds.
- This unique capability makes it nearly impossible to detect and even harder to intercept, rendering most existing missile defense systems obsolete.
- It will be capable of striking both land-based and maritime targets with pinpoint precision.
- It can fly at speeds exceeding Mach 5 or 6, nearly 7,400 km per hour.
- It has estimated ranges between 6,000 to 10,000 kilometers.
- What sets Dhvani apart is its sophisticated design.
- The missile features a blended wing-body configuration measuring approximately 9 meters in length and 2.5 meters in width.
- Its advanced heat protection system, utilizing ultra-high-temperature ceramic composites, can withstand temperatures between 2,000-3,000°C generated during atmospheric reentry.
- The stealth-optimized geometry, including angled surfaces and smooth contours, dramatically reduces its radar cross-section, making it virtually invisible to enemy tracking systems.

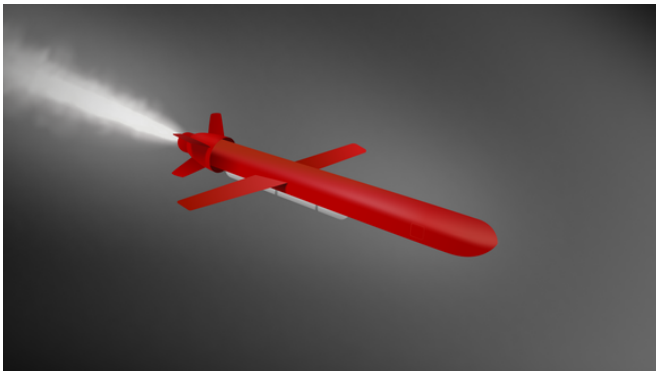
Enshittification

The now-viral term 'enshittification' helped put a name to a change that internet users are noticing: the feeling that many of your digital experiences, transactions, and services are not improving with time but are actually becoming worse because of their makers' updates.

About Enshittification

- It is an informal word used to criticize the degradation in the quality and experience of online platforms over time, often due to profit-seeking behavior or monopolistic control.
- In 2022, the Canada-born author, tech journalist, and activist Cory Doctorow coined the term "enshittification."
- It is a way of naming the process through which internet platforms are being made deliberately worse for customers, by their decision-makers, until they decay completely.
- It is also used to refer to a range of symptoms that degrade your experience as an internet user or customer.
- Some examples include the insertion of advertisements, self-preferencing by tech companies, unfair bias in search results, once-free features becoming paid, genuine products being replaced with lower-value dupes, and more.

Burevestnik Missile



The Russian President recently announced that Russia had tested its Burevestnik nuclear-powered cruise missile.

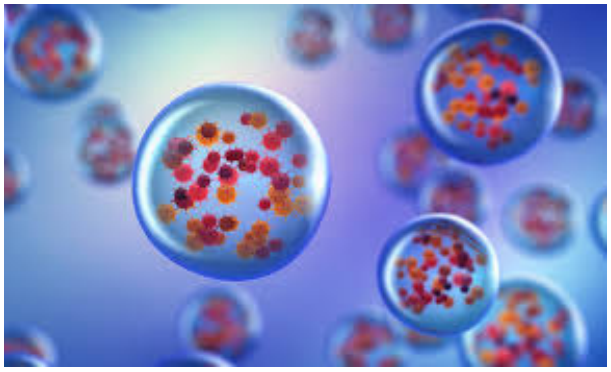
About Burevestnik Missile

- The Burevestnik, whose name translates as “storm petrel“, is a ground-launched, low-flying cruise missile that is not only capable of carrying a nuclear warhead but is also nuclear-powered.
- It was developed by Russia.
- It is one of six strategic weapons that the Russian President introduced in a 2018 speech.
- It is code-named ‘SSC-X-9 Skyfall’ by NATO.

Burevestnik Missile Features

- It is powered by a small nuclear reactor, which heats up air to propel the missile forward.
- Its nuclear propulsion gives the missile much longer range than traditional turbojet or turbofan engines that are limited by how much fuel they can carry.
- That propulsion gives it virtually unlimited range, allowing it to loiter for days, circling the enemy’s air defenses and attacking from an unexpected direction.
- The missile is also designed to fly at low altitudes, much lower than a conventionally powered cruise missile, which would make it harder for air-defence radar to detect.

Encephalomyocarditis Virus



Recently, an autopsy report from the Indian Veterinary Research Institute revealed that a lone African elephant at the National Zoological Park in Delhi died due to the rare rodent-borne virus — encephalomyocarditis virus (EMCV).

About Encephalomyocarditis Virus

- It is a non-enveloped, positive-sense, single-stranded RNA virus that is part of the Cardiovirus genus and Picornaviridae family.
- It is the causative agent of encephalomyocarditis (EMC) infection in swine and other mammals.
- African elephants are particularly susceptible to the virus, with outbreaks reported worldwide in captivity and in the wild.
- EMCV is a zoonotic disease, therefore humans are susceptible to infection. Most infections in humans are asymptomatic.
- Transmission: The virus can be transmitted by food or water contamination caused from feces or urine of a rodent species.
- Symptoms of Encephalomyocarditis Virus infection in humans: Symptoms of EMCV infection in humans can include fever, headache, muscle aches, nausea, vomiting, and in severe cases, neurological symptoms like confusion and seizures.
- Hosts: Pigs, non-human primates, zoo animals, and various wild species can be affected.
- Treatment: Supportive care to manage symptoms and complications, with no specific treatment available.

Silicon Carbide

Recently, the Chief Minister of Odisha performed the groundbreaking ceremony for the country's first end-to-end silicon carbide semiconductor production plant.

About Silicon Carbide

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

Properties of Silicon Carbide

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

Applications of Silicon Carbide

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

Project Suncatcher

Recently, Google announced a new research initiative called Project Suncatcher.

About Project Suncatcher

- It is a research initiative exploring how constellations of solar-powered satellites could host data centres in space.
- It is an initiative of Google.
- Google aims to deploy high-performance AI accelerators in space and build a space-based infrastructure.

Features of Project Suncatcher

- Project Suncatcher will build modular satellite arrays linked by high-speed free-space optical communication, supporting data transfer at tens of terabits per second.
- It will send AI data centers into space by launching solar-powered satellites equipped with its Tensor Processing Units (TPUs), specialised AI chips.
- The plan includes launching two prototype satellites in partnership with Planet Labs by early 2027 to test the hardware's durability and performance in space.
- The proposed system consists of a constellation of networked satellites, likely operating in a dawn–dusk sun-synchronous low earth orbit.
- Early tests have shown Google's Trillium-generation TPUs withstand radiation at levels similar to those found in space.

Scrub Typhus

A Gulf Keralite's impulsive decision to return home to treat a persistent fever turned out to be life-saving after he was diagnosed with scrub typhus — a potentially fatal infection that requires early treatment.

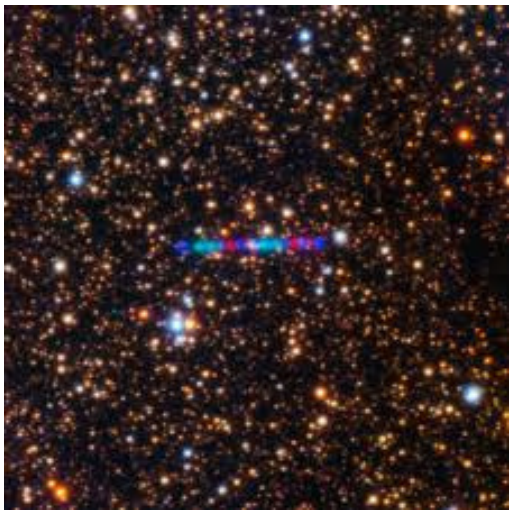
About Scrub Typhus

- It is an infectious disease caused by bacteria called Orientia tsutsugamushi.
- It is transmitted through infected chiggers (young mites).
- Several factors, like vector abundance, climatic factors, exposures like farming and owning domestic animals, outdoor activities and sanitation, affect its prevalence.
- This disease is more prevalent in cooler months.
- It will not spread from person to person.
- Symptoms:
  - The symptoms typically include fever, headache, body ache, and sometimes a rash.
  - In severe cases, the infection can lead to respiratory distress, brain and lung inflammation, kidney failure, and multi-organ failure, ultimately resulting in death.
- Treatment:
  - It is treated with doxycycline, which is most effective when administered early.
  - There is no vaccine available for this disease.

Key Facts about Typhus Fever

- Typhus (or typhus fever) is the name used for several different types of bacterial infections spread by bug bites that cause similar symptoms, like high fever and rash.
- These symptoms can be severe and lead to serious complications if left untreated.
- There are three types of illnesses commonly called typhus:
  - Epidemic Typhus: It is caused by Rickettsia prowazeki and it is spread to people through contact with infected body lice.
  - Scrub Typhus: It is caused by Orientia tsutsugamushi and spread by chiggers.
  - Murine Typhus: It is caused by Rickettsia typhi spread by fleas. It occurs in tropical and subtropical climates around the world.

Interstellar Comet 3I/ATLAS



Recently, NASA astronomers have confirmed the detection of water's chemical fingerprint on the interstellar comet 3I/ATLAS.

About Interstellar Comet 3I/ATLAS

- It is the third known interstellar object from outside our solar system after 1I/'Oumuamua(2017) and 2I/Borisov (2019).
- It has hyperbolic orbit and travels at 57–68 km/s speed relative to the Sun.
- It will exit the solar system permanently after a brief interaction with the Sun.
- This interstellar comet was first seen by a NASA-supported telescope in Rio Hurtado, Chile, which is part of the ATLAS (Asteroid Terrestrial-impact Last Alert System) survey.

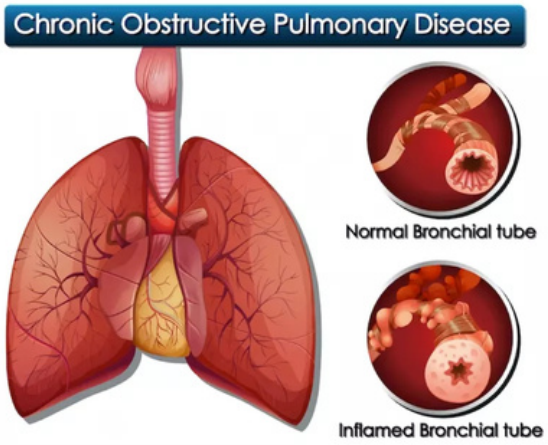
Physical Characteristics of Interstellar Comet 3I/ATLAS

- 3I/ATLAS is confirmed to be an active comet, with a visible coma, a cloud of ice particles and dust surrounding the nucleus.
- As it nears the Sun, it is expected to develop a tail, a characteristic cometary feature formed by solar heating.
- Photometric analysis shows a reddish hue suggests the surface may be rich in complex organic compounds or water ice.
- The nucleus is estimated to be 10–30 km wide.

What are interstellar Objects?

- These are celestial bodies that originate outside the solar system, and travel through it. These objects are not gravitationally bound to a star.
- They can come from other solar systems and be thrown into interstellar space (the area between the stars) due to collisions or be slingshotted by a planet's or star's gravity.
- The trajectory of these objects is basically open-ended hyperbolic orbit, where there is a perihelion point (closest to the Sun) but no aphelion.

Chronic Obstructive Pulmonary Disease



According to the World Health Organization, Chronic Obstructive Pulmonary Disease (COPD) is the fourth-leading cause of death worldwide, causing 3.5 million deaths in 2021.

About Chronic Obstructive Pulmonary Disease

- It is a condition caused by damage to the lungs that results in breathing difficulties.
- The damage, which is inflammation and scarring, can be in the airways to the lungs, in the air sacs of the lungs, or both.
- Causes: One of the main causes of COPD is smoking. And another is indoor air pollution.

Types of Chronic Obstructive Pulmonary Disease

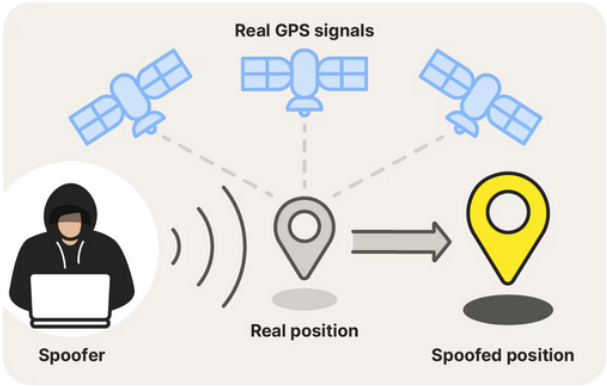
- Chronic bronchitis: It is caused by inflammation of the lining of the airways, or the tubes that bring air into your lungs.
- When these bronchi, are inflamed, they become narrower, leading to restricted airflow, and causing the formation of extra, thick mucus.
- Emphysema: It develops when the air sacs of the lungs, known as alveoli, are damaged. This makes it difficult for the lungs to pass adequate oxygen into the bloodstream, causing shortness of breath.

Symptoms of Chronic Obstructive Pulmonary Disease

- A cough with mucus that lasts for three months or more at a time;
- Experiencing tightness in the chest;
- Shortness of breath especially during physical activities;
- Wheezing or whistling sounds in the breath;
- Frequent chest infections and fatigue or extreme tiredness.
- Treatment: There is no cure for COPD. Treatment is based on the severity and is focused on managing symptoms and reducing flare ups.

GPS Spoofing

Delhi's Indira Gandhi International Airport faced massive disruptions recently when the flight operations witnessed GPS spoofing.



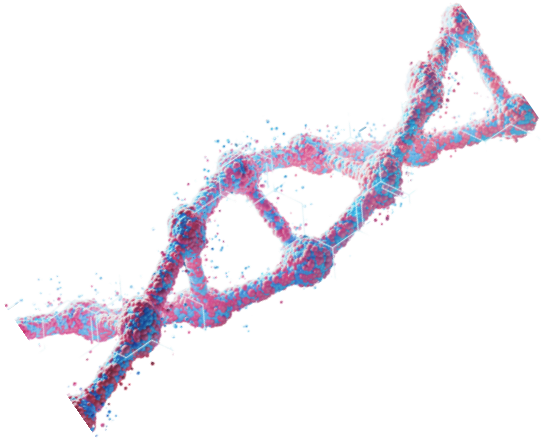
What is a Spoofing Attack?

- A "spoofing attack" is a broad category of cyberattack where fake data is disguised as originating from a trusted source to deceive systems or users.
- Kinds of spoofing include GPS Spoofing, IP spoofing—often used to avoid detection while performing Distributed Denial of Service (DDoS)—as well as SMS spoofing and caller ID spoofing, where messages or calls appear to be from another number or caller ID.

About GPS Spoofing

- GPS spoofing involves manipulating navigation data with malicious intent.
- Unlike jamming, which blocks GPS signals, spoofing involves transmitting fake satellite signals to override genuine ones.
- The aircraft's navigation systems pick up these counterfeit signals and calculate wrong data for position, altitude, time, and speed.
- The aim is for the target to act on false navigation information.
- The fake signals over-ride the genuine satellite signals using specialised hardware or software.
- Since GPS satellite signals are weaker, the receiver considers the amplified spoofed signals as authentic.
- Aircraft may end up flying blind, or even worse, dangerously off-course.
- Spoofing is often reported in:
  - Conflict zones like the Black Sea region
  - West Asia and the Middle East
  - Military action areas or electronic warfare zones
- Globally, spoofing and jamming of GPS signals have become a growing menace for airlines.
- The International Air Transport Association (IATA) recorded 4.3 lakh cases of GPS jamming or spoofing over conflict zones in 2024, up 62 percent from 2023.

What is Junk DNA?



About Junk DNA:

- In genetics, the term junk DNA refers to regions of DNA that are noncoding.
- DNA contains instructions (coding) that are used to create proteins in the cell.
- However, the amount of DNA contained inside each cell is vast, and not all of the genetic sequences present within a DNA molecule actually code for a protein.
- Some of this noncoding DNA is used to produce non-coding RNA components such as transfer RNA, regulatory RNA and ribosomal RNA.
- However, other DNA regions are not transcribed into proteins, nor are they used to produce RNA molecules, and their function is unknown. These are known as junk regions of DNA.
- The proportion of coding versus noncoding DNA varies significantly between species.
- In the human genome, for example, almost all (98%) of the DNA is noncoding, while in bacteria, only 2% of the genetic material does not code for anything.
- However, over the years, researchers have found evidence to suggest that junk DNA may provide some form of functional activity.
- Some lines of evidence suggest that fragments of what were originally non-functional DNA have undergone the process of exaptation throughout evolution.
- Exaptation refers to the acquisition of a function through means other than natural selection.

Scintillometer

Recently, a scintillometer was installed at the Tamil Nadu Rice Research Institute (TRRI), Aduthurai, Tamil Nadu.

About Scintillometer

- It is an optical instrument that measures heat and moisture exchange between the land surface and the atmosphere.

Working of Scintillometer

- It operates by transmitting a light beam between two fixed points.
- Minute, rapid fluctuations in the beam caused by turbulent air known as scintillations are analysed to estimate heat transfer from the land to the atmosphere.
- It was installed recently in an existing suite of sensors at the TRRI Critical Zone Observatory (CZO).

Key Facts about Critical Zone Observatory of Tamil Nadu Rice Research Institute

- It was established under Tamil Nadu Agricultural University (TNAU) with support from the National Centre for Earth Science Studies (NCESS), and became fully operational in 2022.
- It is one of three such observatories in India and the only one in Tamil Nadu.
- The site records weather parameters, soil moisture and direct air–surface fluxes; the scintillometer now provides direct estimates of sensible heat flux.
- Main Instruments at about Critical Zone Observatory Site: Automatic Weather Station, COSMOS soil-moisture sensor, pan evaporimeter and eddy-covariance tower.
- Functions:
  - The site records weather parameters, soil moisture and direct air–surface fluxes; the scintillometer now provides direct estimates of sensible heat flux.
  - These observations improve estimates of evapotranspiration, soil moisture and local microclimate, directly supporting irrigation planning and local forecasts.
  - The observatory will generate long-term datasets on meteorological, canopy and hydrological parameters for the Cauvery delta.
- Advantages: These are crucial for managing water and crops in this climate-sensitive agricultural region.
- It would strengthen climate-resilient decision-making in the Cauvery delta.

Visible Emission Line Coronagraph

Recently, scientists at the Indian Institute of Astrophysics (IIA) have collaborated with NASA to estimate the crucial parameters of a coronal mass ejection (CME) by using Visible Emission Line Coronagraph (VELC) payload onboard India's Aditya-L1 mission.

About Visible Emission Line Coronagraph

- It is the primary payload of the Aditya-L1 Mission–India's first mission to observe the Sun from a vantage point 1.5 million kilometres from the earth.

Features of Visible Emission Line Coronagraph

- It is an internally occulted solar coronagraph capable of simultaneous imaging, spectroscopy, and spectro-polarimetry close to the solar limb.
- It consists of a coronagraph, spectrograph, polarimetry module, and detectors, aside from auxiliary optics.
- It is built by the Indian Institute of Astrophysics (IIA) at its CREST (Centre for Research and Education in Science and Technology) campus at Hosakote, Karnataka.

Objectives of Visible Emission Line Coronagraph

- It will observe the solar corona, which is the tenuous, outermost layer of the solar atmosphere.
- VELC can image the solar corona down to 1.05 times the solar radius, which is the closest any such payload has imaged.
- It will analyze the coronal temperature, plasma velocity, density, etc.
- It will also study Coronal Mass Ejections (CMEs) and the solar wind.

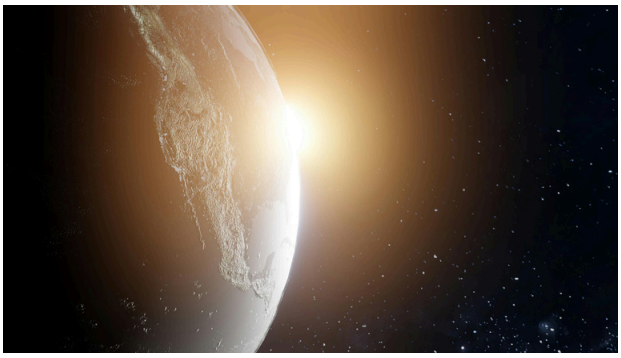
Ricin

The Gujarat Anti-Terrorist Squad recently busted a suspected terror syndicate by arresting a 'doctor', who was allegedly preparing the highly lethal chemical poison, 'Ricin', and whose handler is associated with the Islamic State Khorasan Province, and two others.

About Ricin

- Ricin is a poison found naturally in castor beans.
- If castor beans are chewed and swallowed, the ricin that comes out can cause injury.
- Ricin can be made from the waste material left over from processing castor beans.
- Ricin can be in the form of a powder, a mist, or a pellet.
- It can also be dissolved in water or weak acid.
- It is stable under normal conditions. However, it will not work if temperatures are over 80 degrees centigrade (176 degrees Fahrenheit).
- It is toxic when inhaled, ingested, or injected.
- As few as five to ten micrograms per kilogram can be lethal.
- How Does It Work?
  - Ricin works by getting inside the cells of a person's body and preventing the cells from making the proteins they need. Without the proteins, cells die.
  - Eventually this is harmful to the whole body, and death may occur.
- It is of special concern because of its potential use as a biological weapon.
- Accidental exposure to ricin is rare and results primarily from the ingestion of castor seeds.
- Treatment:
  - No antidote exists for ricin.
  - Symptomatic ricin poisoning is treated by providing supportive medical care to minimize the effects of the poisoning.

Rare Earth Hypothesis



New insights from exoplanet studies revive and reshape the debate over the Rare Earth Hypothesis

About Rare Earth Hypothesis

- The Rare Earth hypothesis posits that the emergence of complex life on planets outside Earth is highly unlikely due to a unique combination of specific conditions required for such life to thrive.
- Proposed by paleontologist Peter Ward and astronomer Donald Brownlee in 2000, the hypothesis suggests that while microbial life may be abundant throughout the universe, the prerequisites for complex organisms are exceedingly rare.
- Key factors influencing the probability of complex life include the planet's location within its galaxy, the type and distance of its star, geological characteristics like size and tectonic activity, and the presence of a large moon.
- This perspective contrasts sharply with the principle of mediocrity, which suggests that Earth is just one of many planets capable of supporting complex life.
- The Rare Earth hypothesis provides insight into the Fermi paradox—highlighting why, despite the vastness of the universe, intelligent life has yet to make contact with humanity.
- By analyzing the requirements for both astronomical and biological conditions, the hypothesis concludes that the chance of finding another planet with complex life is minimal.
- If validated, this view could reposition Earth from being a typical planet to one characterized as extraordinarily special in the context of the universe.

Vanadium

Recently, the union Minister for Power inaugurated India's first MWh-scale Vanadium Redox Flow Battery (VRFB) system at NTPC's NETRA (Noida).

About Vanadium

- It is a chemical element with the symbol "V" and atomic number 23.

Properties of Vanadium

- It is a silver-gray, ductile, and malleable metallic element.
- It is harder than most metals and exhibits good corrosion resistance against alkalis and acids.

Occurrence of Vanadium

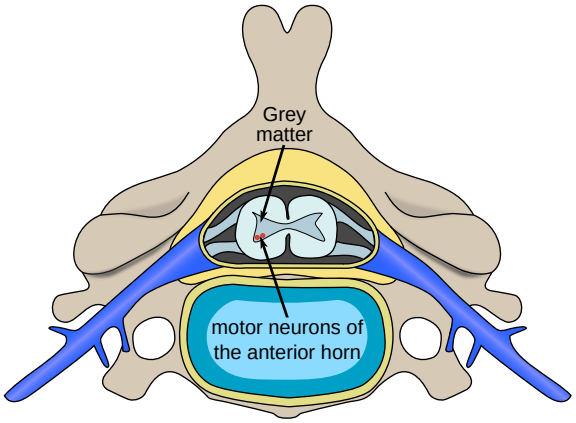
- It is found combined in various minerals, coal, and petroleum, vanadium is the 22nd most abundant element in Earth's crust.
- It is found in over 60 different minerals, including vanadinite, carnotite, roscoelite and patronite.
- The largest resources of vanadium minerals are found in South Africa and Russia.
- Leading Producers: China, Russia and South Africa,

Applications of Vanadium

- It is used as an alloying element in steel and other metals.
- In Vanadium Flow Batteries (VFBs), vanadium is used to create a reliable, safe and stable solution for the storage of renewable energy.
- Chemical Catalysts: Vanadium compounds are used as catalysts in various chemical reactions, such as the production of sulfuric acid.
- Nuclear Applications: Vanadium is used in some nuclear reactors as a structural material and neutron moderator.
- Medical Field: In the medical sphere, vanadium is used to treat a number of ailments, including diabetes, heart disease and high cholesterol.

Motor Neuron Diseases

Scientists recently developed a breakthrough therapy that clears toxic proteins from nerve cells—a discovery that could transform the treatment of motor neuron disease (MND).



About Motor Neuron Disease

- It is a rare condition that progressively damages parts of the nervous system.
- This leads to muscle weakness, often with visible wasting.
- MND is also called amyotrophic lateral sclerosis (ALS) and Lou Gehrig's disease.

Motor Neuron Disease Cause

- MND happens when specialist nerve cells in the brain and spinal cord, called motor neurones, stop working properly and die prematurely. This is known as neurodegeneration.
- Motor neurons instruct the muscles to move by passing on signals from the brain.
- They play a role in both conscious and automatic movements, such as swallowing and breathing.
- As MND progresses, it can become more difficult to do some or all of these activities.
- Messages can no longer travel between your brain and muscles. This causes your muscles to become weaker and weaker. This eventually causes paralysis.
- Generally, MND is believed to be caused by a combination of environmental, lifestyle, and genetic factors.
- 20% of cases are linked to genetic causes. Half of genetic cases will be in people who have a family history of MND.
- Adults of any age can get motor neurone disease (MND), but it usually affects people over the age of 50.

Motor Neuron Disease Symptoms

- The symptoms of MND start gradually over weeks and months.
- They tend to appear on one side of the body first and get progressively worse.
- MND often begins with weakness of the muscles in the hands, feet, or voice, although it can start in different areas of the body and progress in different patterns and at different rates.
- People with MND become increasingly disabled.
- Average life expectancy after diagnosis is one to five years, with 10 percent of people with MND living 10 years or more.

Motor Neuron Disease Treatment

- There's no cure for MND, but treatment can help reduce the impact the symptoms have on your life.

ESCAPEDE Mission

Recently, Blue Origin has successfully launched Nasa's highly anticipated Escapade mission to Mars.

About ESCAPEDE Mission

- The ESCAPADE (Escape and Plasma Acceleration and Dynamics Explorers) mission is the first coordinated multi-spacecraft orbital science mission to Mars.
- Its twin orbiters are known as Blue and Gold which will take simultaneous observations from different locations around Mars.
- It is part of NASA's SIMPLEx (Small Innovative Missions for Planetary Exploration) program.
- This mission has chosen 'launch and loiter' strategy
- It means the satellites will launch from Earth toward the Lagrange 2 Point (L2), a point in space where the balance of Earth and Sun's gravitational pull ensures that a spacecraft stays put.
- The spacecraft will stay loiter at L2 until the apt window for Mars travel opens up, and then it will move toward Mars in late 2026.

Objectives of ESCAPEDE Mission

- It will reveal the planet's real-time response to space weather and how the Martian magnetosphere changes over time,
- These spacecraft will travel to Mars to study the interaction between solar wind, streams of charged particles from the Sun, and the Martian magnetic field.
- Understanding how solar wind strips Mars of its atmosphere is critical for planetary science and future human exploration.

Hydrogen Valley Innovation Clusters

Recently, the union Minister of State (Independent Charge) for Science and Technology announced that four Hydrogen Valley Innovation Clusters (HVICs) are being developed across the country.

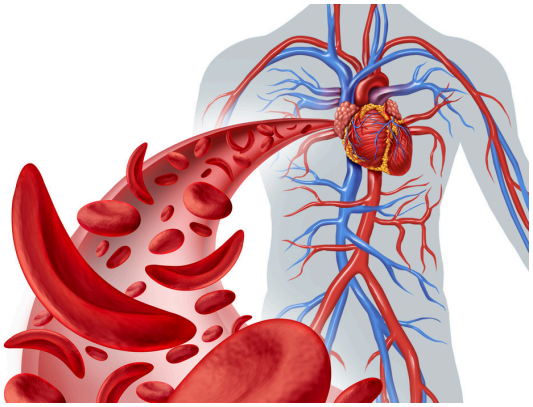
About Hydrogen Valley Innovation Clusters

- These are being developed across the country to demonstrate the full green hydrogen value chain — from production and storage to transport and utilization.
- Funding: Total investment of ₹485 crore.
- The HVIC project is aimed at "building a local hydrogen ecosystem by connecting supply and demand across sectors like transport, industry, and energy, while also fostering research, innovation, and skills.
- These clusters were originally conceptualized by the Department of Science and Technology, and now integrated under National Green Hydrogen Mission (NGHM).
- These four Hydrogen Valleys are coming up in Pune, Jodhpur, Bhubaneshwar and Kerala.

What is Green Hydrogen?

- Green Hydrogen is produced using renewable energy, such as solar or wind power, instead of fossil fuels.
- In this process water is split into hydrogen and oxygen through electrolysis, using electricity from solar panels or wind turbines.
- According to standards notified by Govt of India, Hydrogen made this way is considered "green" if the total emissions from the process are very low, not more than 2 kg of CO_2 equivalent for every 1 kg of Hydrogen produced.
- Green Hydrogen can also be produced by converting biomass (like agricultural waste) into hydrogen, as long as emissions remain below the same limit.

Sickle Cell Disease

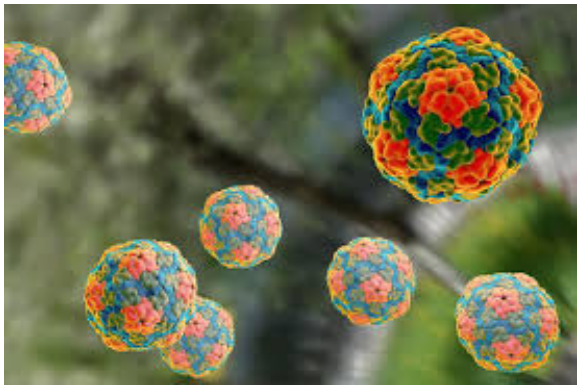


A decade-long study by a Gurugram hospital has found success in curing Sickle Cell Disease among children through bone marrow (stem cell) transplantation, placing India among the leading nations in advanced paediatric transplant outcomes.

About Sickle Cell Disease

- It is a group of inherited blood cell disorders that affect hemoglobin, the protein that carries oxygen through the body.
- SCD can cause episodes of severe pain and lead to life-threatening complications.
- The most common and severe type of SCD is sickle cell anemia.
- How Does it Affect Blood Flow?
  - Normally, RBCs are disc-shaped and flexible enough to move easily through the blood vessels.
  - People with SCD have atypical hemoglobin molecules called hemoglobin S, which can distort RBCs into a sickle, or crescent, shape.
  - When RBCs sickle, they do not bend or move easily and can block blood flow to the rest of the body.
  - SCD interferes with the delivery of oxygen to the tissues.
- What causes it?
  - The cause of SCD is a defective gene, called a sickle cell gene.
  - A person will be born with SCD only if two genes are inherited—one from the mother and one from the father.
- Symptoms:
  - Early stage: Extreme tiredness or fussiness from anemia, painfully swollen hands and feet, and jaundice.
  - Later stage: Severe pain, anemia, organ damage, and infections.
- Treatments:
  - A bone marrow transplant (stem cell transplant) can cure SCD.
  - However, there are treatments that can help relieve symptoms, lessen complications, and prolong life.
  - Gene therapy is also being explored as another potential cure.
  - The UK recently became the first country to approve gene therapy treatment for SCD.

Hepatitis A



Recently, public health experts opined that Hepatitis A deserves a place in India's universal immunisation programme due to its multiple outbreaks across many states in India.

About Hepatitis A

- Hepatitis A is an inflammation of the liver caused by the hepatitis A virus (HAV).
- It occurs throughout the world.
- It is especially common in countries in Latin America, Africa, the Middle East, Asia, the Caribbean, and the Western Pacific.
- Unlike hepatitis B and C, hepatitis A does not cause chronic liver disease but it can cause mild to severe symptoms and rarely fulminant hepatitis (acute liver failure).
- Symptoms: Fever, malaise, loss of appetite, Nausea, diarrhoea, abdominal discomfort, Dark urine and jaundice.

Transmission of Hepatitis A

- It is transmitted primarily by the faecal-oral route; that is when an uninfected person ingests food or water that has been contaminated with the faeces of an infected person.
- The virus can also be transmitted through close physical contact with an infectious person.

Treatment for Hepatitis A

- There is no specific antiviral treatment for hepatitis A.
- Its treatment mainly focuses on supportive care to relieve symptoms and ensure adequate hydration and nutrition.

Ammonium Nitrate

Ammonium nitrate, one of the substances responsible for the Delhi explosion recently, was used in five deadly blasts in the Mumbai city in the past after being mixed with other products.

About Ammonium Nitrate

- Ammonium nitrate (NH_4NO_3) is a crystal-like white solid which is made in large industrial quantities.
- It is a salt of ammonia and nitric acid.
- It is commonly used in agriculture as a high-nitrogen fertilizer, and it has also been used as an oxidizing agent in explosives.
- It has a melting point of 170°C.
- It is highly soluble in water; heating of the water solution decomposes the salt to nitrous oxide (laughing gas).
- It is one of the base ingredients used in the manufacture of commercial explosives. It is the main component of slurry explosives used for mining.

What Makes Ammonium Nitrate So Explosive?

- Ammonium nitrate is not an explosive by itself.
- Other ingredients like fuel, etc., have to be added to make it an explosive.
- For such explosive mixtures to explode, initiators like detonators are required.

Legal Controls on Ammonium Nitrate in India

- Under rules introduced in 2012 and updated in 2021, any mixture containing over 45% ammonium nitrate is legally classified as an explosive.
- A District Magistrate may permit possession of up to 30 metric tonnes, while larger quantities need approval from the Petroleum and Explosives Safety Organisation (PESO).
- PESO issues licences for the manufacture, storage, transport, and use of large quantities of ammonium nitrate.

Sentinel-6B Satellite

Recently, the Sentinel-6B was launched from the Vandenberg Space Force Base in California.

About Sentinel-6B Satellite

- It is a joint mission between the United States' NASA and NOAA, and the European Space Agency.
- Objective: It is an ocean-tracking satellite which will measure the rising sea levels and its impacts on the planet.
- Sentinel-6B is set to carry forward the legacy of Sentinel -6 Michael Freilich, launched in November 2020.
- It will orbit Earth at a speed of 7.2 km per second, completing one revolution every 112 minutes.
- Sentinel-6B will provide primary sea level measurements down to approximately an inch from over 90% of all the oceans.

Components of Sentinel-6B Satellite

- It consists of six onboard science instruments.
- The satellite has two fixed solar arrays, plus two deployable solar panels, and will travel in a longitude direction around Earth in a non-Sun-synchronous orbit.
- It is expected to spend the next 5.5 years in orbit.

Significance of Sentinel-6B Satellite

- It observes Earth's ocean, measuring sea levels to improve weather forecasts and flood predictions.
- It safeguards public safety, benefits commercial industry, and protects coastal infrastructure.

Vitamin K

Vitamin K, often overlooked, is vital for blood clotting, bone strength, and heart health.

About Vitamin K

- It is a fat-soluble vitamin that comes in two forms.
  - The main type is called phylloquinone (Vitamin K1), found in green leafy vegetables like collard greens, kale, and spinach.
  - The other type, menaquinones (Vitamin K2), are found in some animal foods and fermented foods.
  - Menaquinones can also be produced by bacteria in the human body.
- Vitamin K helps to make various proteins that are needed for blood clotting and the building of bones.
  - Prothrombin is a vitamin K-dependent protein directly involved with blood clotting.
  - Osteocalcin is another protein that requires vitamin K to produce healthy bone tissue.
- Vitamin K is found throughout the body, including the liver, brain, heart, pancreas, and bone.
- It is broken down very quickly and excreted in urine or stool.
- Because of this, it rarely reaches toxic levels in the body even with high intakes, as may sometimes occur with other fat-soluble vitamins.

Why Do Modern Diets Often Cause Vitamin K Deficiency?

- Many people fall short of Vitamin K not because food is scarce but because daily diets lack greens and fermented foods.
- Over-frying or overcooking vegetables also destroys much of the vitamin.
- Long-term antibiotic use, liver disease, or fat-absorption disorders can further lower Vitamin K levels since it is fat-soluble and requires dietary fat for absorption.
- Vitamin K deficiency can contribute to significant bleeding, poor bone development, osteoporosis, and increased cardiovascular disease.

Katkari Tribe

To highlight the plight of the Katkari Tribe, the Shramjeevi Organisation will hold a two-day protest featuring silent fasts and symbolic lamps, demanding land rights, unpaid wages, and dignity for the marginalised community.

About Katkari Tribe

- It is a primitive tribe found in Maharashtra (Pune, Raigad, and Thane districts) and parts of Gujarat.
- It is one of the 75 Particularly Vulnerable Tribal Groups (PVTGs) in India.
- They were historically forest dwellers.
- Katkaris are also known as Kathodis because of their old occupation of making Katha (Catechu), the thickened sap from wood of Khair (Acacia catechu).
- The Katkaris were also one of the few tribal communities of India that consumed rodents.
- Many of them still live in their traditional huts made of bamboo and anything they can find in the forest.
- Despite having a patriarchal system, does not follow the joint family structure, preferring the nuclear family model.
- Language:
  - They are bilingual, speaking the Katkari language amongst themselves and Marathi with others.
  - A few of them speak Hindi as well.
- Occupation:
  - They serve as agricultural labourers and sell firewood and some jungle fruits.
  - They also take up fishing for domestic consumption, coal making, and brick manufacturing.
- They have tremendous knowledge about uncultivated foods like fish, crabs, animals, birds, tubers/rhizomes, wild vegetables, fruits, nuts, etc.
- A majority of the Katkari families are landless. The landless rate of 87% among the Katkari is much higher than 48% for rural households in India as a whole.
- As a result of landlessness, migration is rampant, and livelihoods are seasonal.

Ramman Festival

Recently, the President of India was presented with a Ramman mask at a special session of the Uttarakhand Assembly.

About Ramman Festival

- It is an annual religious festival celebrated in late April in the twin villages of Saloor-Dungra, Uttarakhand, in honour of the local deity Bhumiyal Devta.
- In 2009, Ramman was inscribed in the list of UNESCO's Intangible Cultural Heritage of Humanity.

Features of Ramman Festival

- It features complex rituals, recitations of the Ramayana, songs, and masked dances, with each caste and group playing distinct roles.
- Divine Storytelling: The performances include recitations of the Rama Katha (episodes from the Ramayana), combined with masked dances of deities and local legends, blending mythic and local narrative layers.
- Sacred Space: It is held in the courtyard of the Bhumiyal Devta temple in Saloor Dungra.
- Community Participation: Entire village households contribute: roles are caste-based (priests, mask-makers, drum players), funding comes from the village, and participation spans elders to youth.
- Transmission of Knowledge & Values: Oral transmission of epic songs, dance forms, and ritual lore across generations.
- Fusion of Art Forms: It blends narration, masked dances, ritual drama, music, and mask craft into one integrated festival.
- The festival involves theatrical performances of the Ramayana and local legends, in which people sing songs and wear masks while dancing.
- There are 18 different types of masks made of Bhojpatra, Himalayan birch, that performers wear during the event.
- Some of the instruments documented include: Dhol (a type of drum) Damau (smaller percussion drum), Manjira (small hand cymbals), Jhanjhar (larger cymbals), Bhankora (a kind of trumpet).

Konark Sun Temple

The Archaeological Survey of India (ASI) has prohibited tourists from entering the 'Nata Mandap' of the Konark Sun Temple in Odisha's Puri district.

About Konark Sun Temple

- It is located on the coastline of Odisha in the Puri district.
- Also called the Surya Devalaya, the temple is dedicated to the Hindu sun god Surya.
- Textual evidence indicates that Narasimha I (who reigned between 1238 and 1264) of the Eastern Ganga dynasty built the temple in 1250 CE.
- It was designated a UNESCO World Heritage Site in 1984.

Konark Sun Temple Features

- It is a classic example of the Odisha style of architecture, or Kalinga architecture.
- The height of the Sun Temple at Konark is estimated to be around 227 feet, making it one of the tallest temples ever built in the country.
- The temple complex has the appearance of a 100-foot-high solar chariot, with 24 wheels and pulled by six horses, all carved from stone.
- It is oriented towards the east so that the first rays of the sunrise strike the main entrance.
- The wheels of the temple are sundials, which can be used to calculate time accurately to a minute.
- Around the base of the temple, there are images of animals, foliage, warriors on horses, and other interesting structures.
- The temple also features elaborate stone carvings depicting scenes from Hindu mythology.
- The temple was constructed using three types of stones – the laterite stone for the boundary walls, flooring, and staircase; Khondalite for the structure; and Chlorite stone for the door jams and lintel.
- The use of iron strips to hold the structure together can be seen amongst the ruins of the temple.
- The temple was called Black Pagoda, attributed to its dark facade, by the Europeans who used it for navigation for their ships.
- It is said that the temple could draw ships to the shore due to its magnetic powers.
- The temple remains a site of contemporary worship for Hindus, during the annual Chandrabhaga Festival, around the month of February.

Maram Naga Tribe

Centre recently sanctioned Rs 9 crore under Jan Man Scheme for Maram Naga tribe development, welfare projects, and cultural preservation in Manipur.

About Maram Naga Tribe

- The Maram Naga tribe belongs to the Naga ethnic group, inhabiting the Northeastern part of India as well as the Western part of Myanmar.
- The Maram habitat falls under the Senapati district of Manipur.
- The Marams are surrounded by other Naga tribes in all directions.
- They are considered to be a part of the Tibeto-Burman family of the Mongoloid race.
- Language:
  - Linguistically, they belong to the sub-family of the Sino-Tibetan family.
  - The people speak the Maram language. There are some variations in the way the dialect is spoken, corresponding with geographical location.
  - They use Roman script in writing their language.
- Occupation:
  - Agriculture is the main occupation of the people.
  - Shifting cultivation is the main cultivation practiced by them. They are also involved in wet cultivation.
  - Hunting is the secondary occupation of Maram tribes.
- Beliefs:
  - Maram tribes are the worshippers of supernatural benevolent and malevolent beings.
  - The two major festivals of the Marams are Punghi (celebrated in July) and Kanghi (in December).
  - The tribe also celebrates a unique festival called Mangkang around April every year, dedicated to the women folks.

Kendriya Grihmantri Dakshata Padak

Recently, the 'Kendriya Grihmantri Dakshata Padak' has been awarded for the year 2025.

About Kendriya Grihmantri Dakshata Padak

- It has been instituted by the Ministry of Home Affairs, Government of India in 2024.
- The award aims to encourage professional standards and boost the morale of officers and officials across the country.
- It is given to recognize excellent work, promote high professional standards and boost the morale of the concerned official/officer in the following four fields:
  - Special Operation
  - Investigation
  - Intelligence
  - Forensic Science
- It was created by merging the 4 previously existing MHA awards –
  - The Special Operation Medal,
  - The Medal for Excellence in Investigation,
  - The Exceptional Intelligence Efficiency Medal, and
  - The Union Home Minister's Award for Meritorious Service.
- Eligibility: It is conferred on members of the Police Forces, Security Organization, Intelligence Wing/Branch/Special Branch of State/Union Territories/Central Police Organizations (CPOs)/Central Armed Police Forces (CAPFs) and Forensic Science (Central / State / Union Territories) throughout the Indian Union.
- The medal is announced on 31st of October every year, on the occasion of the Birth Anniversary of Sardar Vallabhbhai Patel.

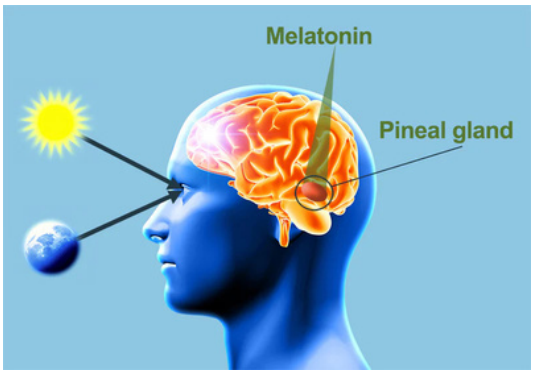
Exercise ‘Poorvi Prachand Prahar

India to hold tri-service exercise 'Poorvi Prachand Prahar in Mechuka, Arunachal Pradesh.

About Exercise 'Poorvi Prachand Prahar

- It is a tri-service military exercise conceived as a forward-looking exercise, which will validate multi-domain integration across land, air, and maritime fronts.
- It will be held in Mechuka, Arunachal Pradesh.
- Aim: It is aimed at enhancing warfighting capabilities, technological adaptation, and operational synergy among the Army, Navy, and Air.
- It refines interoperability, improves situational awareness, and validates command-and-control structures for joint missions.
- Focus: The exercise focuses on multi-domain integration — across land, air and maritime domains — to enhance operational synergy, technological adaptation, and readiness for future conflicts.
- The exercise involves coordinated employment of special forces, unmanned platforms, precision systems and networked operations centres operating in unison under realistic high-altitude conditions.
- Previous Exercises: ‘Poorvi Prachand Prahar’ follows previous tri-service drills — ‘Bhala Prahar’ (2023) and ‘Poorvi Prahar’ (2024).

Melatonin



Recently, concerns have been raised by doctors about melatonin supplements being taken by a large number of people with no medical supervision.

About Melatonin

- Melatonin is a naturally-occurring hormone in human beings that controls sleep and wake cycles in our daily lives.
- Its levels rise in the evening, helping to promote sleep.
- It is secreted by the pineal gland in the human body.
- Pineal gland releases the most melatonin when there's darkness and decreases melatonin production when you're exposed to light.
- Melatonin makes us sleepy at certain times of the day. It starts to secrete when our bodies are getting ready to go to sleep and usually takes about 30 to 45 minutes to take full effect.
- Its secretion is at its highest in the middle of the night and gradually starts to decrease until we are ready to wake up and start our day.
- Melatonin can also be made synthetically in a lab and sold as a dietary supplement. It's called exogenous melatonin.
- Those people whose sleep is not optimal and who travel frequently across time zones prefer melatonin supplements.
- Side Effects of Melatonin supplements
- Overuse of melatonin may cause headaches, hormonal changes, or mood swings, disturbing the very rhythm and sleep cycle.

Vande Mataram 150 Years Celebration

The Prime Minister of India will inaugurate the year-long commemoration of 150 years of the National Song "Vande Mataram" in New Delhi.

About Vande Mataram 150 Years Celebration

- "Vande Mataram," written by Bankim Chandra Chatterjee in a blend of Sanskrit and Bengali, is the National Song of India.
- It was first featured in his novel Anand Math in 1882, with its tune composed by Yadunath Bhattacharya.
- It became a symbol of patriotism during India's freedom struggle.

Historical Background of Vande Mataram

- It was initially composed independently and later included in Bankim Chandra Chatterjee's novel "Anandamath" (published in 1882).
- It was first sung by Rabindranath Tagore at the 1896 Congress Session in Calcutta.
- Vande Mataram, as a political slogan, was first used on 7 August 1905.
- In 1907, Madam Bhikaji Cama raised the tricolour flag for the first-time outside India in Stuttgart, Berlin. The words Vande Mataram were written on the flag.
- On 24 January 1950, the Constituent Assembly adopted Vande Mataram as the National Song of India.
- The National Song is held in equal reverence to the national anthem, but it is not mandatory to sing it at any given occasion.

ReALCRaft Portal

Recently, the government notified rules for "Sustainable Harnessing of Fisheries in the Exclusive Economic Zone" and an Access Pass required for mechanized and large-sized motorized vessels can be obtained through the online ReALCRaft portal.

About ReALCRaft Portal

- The Registration And Licensing of Fishing Craft (ReALCRaft) portal is developed as a national online platform under open source technology.
- It is developed by the Department of Fisheries, Ministry of Fisheries, Animal Husbandry & Dairying.
- It provides web-based, citizen-centric services to marine fishers and coastal States/UTs for the registration and licensing of fishing vessels, transfer of ownership, and related processes.
- Objectives: To develop a modern, comprehensive and transparent vessel data management system in the country with the aim to enhance security features and to bring efficiency, transparency, accountability and reliability in services.

Features of ReALCRaft Portal

- Integration with state-specific payment gateway (Bank /treasury),
- Integration with security agencies to record the movements and track the vessels.
- Upstream integration with insurance agencies, subsidy schemems for eDBT.
- Integration with ISRO facilitates real-time communication with fishermen at sea.
- Integration & data sharing with Govt. Agencies/ Security Agencies
- It is also being integrated with Marine Products Export Development Authority (MPEDA) and the Export Inspection Council (EIC) for issuance of Fish Catch and Health Certificates.

National Social Assistance Programme

NATIONAL SOCIAL ASSISTANCE PROGRAMME

The National Social Assistance Programme is serving as a key pillar of India's social security system through its various components and providing essential support to citizens in need.

About National Social Assistance Programme

- It was introduced in 1995 as a fully funded Centrally Sponsored Scheme that extends financial support to individuals living below poverty line (BPL).
- Nodal Ministry: It is implemented by the Ministry of Rural Development.

Five sub-schemes of Social Assistance Programme

- Indira Gandhi National Old Age Pension Scheme (IGNOAPS)
  - It extends financial assistance to elderly citizens aged 60 years and above who belong to families living below the poverty line by the Government of India.
  - Under this scheme, individuals between 60 and 79 years of age receive Rs.200 per month from the Central Government, while those aged 80 years and above are provided Rs.500 per month.
- Indira Gandhi National Widow Pension Scheme (IGNWPS)
  - Under this scheme, financial assistance is extended to widows aged between 40 and 79 years who belong to families living below the poverty line, as identified by the Government of India.
  - Each eligible beneficiary in this age group receives Rs.300 per month as central assistance. For widows who are 80 years and above, the amount of central assistance is Rs.500 per month.
- Indira Gandhi National Disability Pension Scheme (IGNDPS)
  - It caters individuals aged between 18 and 79 years who have severe or multiple disabilities and belong to families living below the poverty line.
  - The beneficiaries are eligible for central assistance of Rs.300 per month. Beneficiaries who are 80 years and above receive Rs.500 per month.
- National Family Benefit Scheme (NFBS)
  - Under this scheme, a household living below the poverty line becomes eligible for lump sum financial assistance in the unfortunate event of the death of its primary breadwinner, provided the deceased was between 18 and 59 years of age.
  - The family receives Rs.20,000 as support to help them cope with the immediate financial difficulties arising from the loss.
- Annapurna Scheme: Under the scheme, 10kg of food grains per month are provided free of cost to those senior citizens who, though eligible under Indira Gandhi National Old Age Pension Scheme (IGNOAPS), are not receiving old age pension.

BIMSTEC-India Marine Research Network Conference

Recently, Kochi hosted the first BIMSTEC-India Marine Research Network (BIMReN) Conference to boost blue economy cooperation.

About BIMSTEC-India Marine Research Network Conference

- It is a biennial regional platform for facilitating collaboration among the researchers in the Bay of Bengal Region, for sustainable development of the blue economy by networking the researchers in the BIMSTEC Member Countries.
- Background: It was first announced by the Prime Minister of India during the Colombo BIMSTEC Summit in 2022.
- It was launched in 2024 by the Ministry of External Affairs, Government of India.

Key Features of BIMSTEC-India Marine Research Network Conference

- It has connected 25 institutions and over 50 researchers from BIMSTEC countries.
- It aligns with India's broader regional policy objectives under its Neighbourhood First, Act East, Indo-Pacific and MAHASAGAR strategies.
- It served as a milestone in advancing regional cooperation in marine research and sustainable blue economy initiatives.
- It focused on marine challenges, ecosystem health, and research innovations, including building scientific networks among young researchers, effective marine resource management and harmonious policy development.

RuTAG Initiative

Recently, the Principal Scientific Adviser (PSA) to the Government of India chaired the second annual review meeting of the Rural Technology Action Group (RuTAG) 2.0 initiative.

About RuTAG Initiative

- The Rural Technology Action Group (RuTAG) is an initiative of the Office of the Principal Scientific Adviser (OPSA) which was launched in 2004.
- It was conceptualized as a mechanism to provide a higher level of Science &Technology intervention and support for rural areas.
- Under this initiative, the interventions are designed to be primarily demand-driven, focusing on bridging technology gaps at the grassroots level, upgrading technology, and providing training and demonstrations through innovative projects.

Objectives of RuTAG Initiative

- Connecting Stakeholders: Collaborating with stakeholders Non-Government Organizations, Self Help Groups, Community Organizations, and Start-ups to identify sector-specific technology needs.
- Demand-driven technologies: Developeing technologies based on socio-economic data coherent with national/regional priorities.
- Prototype Validation: ValidatIng developed prototypes and explored commercialization with scalability aspects.
- Commercialization: Commercializing the potentially validated technologies for national/global markets.

What is RuTAG 2.0?

- It was launched by the Office of the PSA in April 2023.
- Focus: With a focus on commercialization and broader dissemination of developed technologies as products, ensuring wider accessibility and socio-economic impact.
- It will emphasize translating innovation into market-ready products reflecting its commitment to driving transformative changes in rural areas and empowering communities for sustainable development.