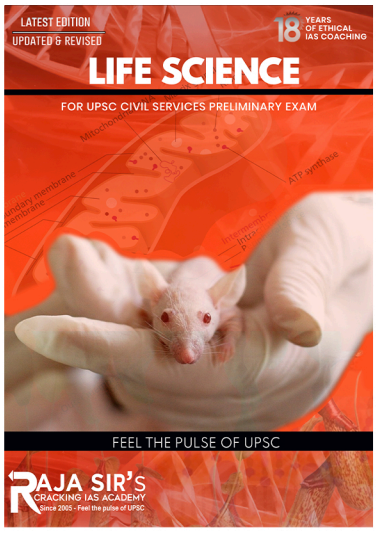
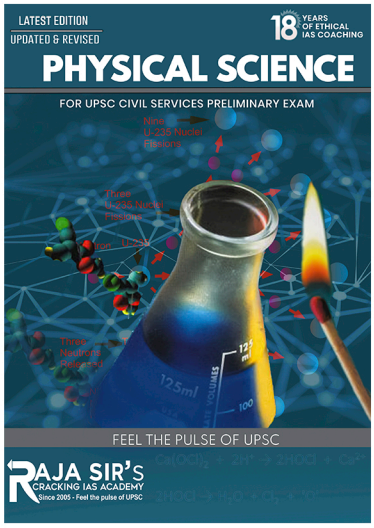
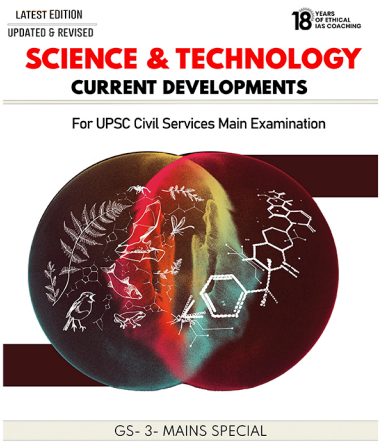
MONTHLY CURRENT AFFAIRS







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Could China take Kuril islands claimed by Japan and Russia?

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POLITY

Government kicks off contractual dispute settlement scheme

The Centre on August 2 launched a settlement scheme for contractual disputes with vendors or suppliers to government and its undertakings, setting an October 31 deadline for firms to submit their claims for consideration.

Finance Minister had announced the scheme, termed 'Vivad se Vishwas II — (Contractual Disputes)' in this year's Union Budget and the Department of Expenditure had indicated the guidelines for its operation in an earlier order issued in late May.

- To settle long-pending litigation in cases where an arbitration order has been challenged in any Indian court.
    - The Union government is aiming to resolve **about 500 cases,** involving an **estimated Rs 1 trillion of funds.**
    - Government held entities such as **Oil and Natural Gas Corporation (ONGC) and National Highways Authority of India (NHAI)** have many disputes with private contractors.
- Such cases are not only holding back **fresh investment** but are also reducing th**e ease of doing business with the government.**

Vivad Se Vishwas Scheme-2

- **Aim:** To promote **ease of doing business** and will cover disputes up to 30 September 2022.
- **On whom Scheme will apply:** The Scheme will apply to disputes **where one of the parties is either the Government of India or its bodies** like public sector banks, public sector financial institutions, central public sector enterprises, Union territories, National Capital Territory of Delhi.
    - It will also cover all organisations where the **central government has a shareholding of 50%** like Metro Corporation.
    - Disputes, where claims are raised against procuring entities along with some other party like the State Government or private party **will not be eligible under the scheme.**
    - **Central Public Sector Enterprises (CPSEs)** are proposed to be eligible to submit their claims under the scheme.
- **Disputes covered:** The Scheme is proposed to cover only **domestic arbitration and not international arbitration.**
    - Settlement of disputed tax, disputed interests, disputed penalty or disputed fees in relation to an assessment or reassessment order on payment of 100% of the disputed tax and 25% of the disputed penalty or interest or fee.
- **Opting out of the scheme:** Bodies can opt out of the Scheme at their discretion with **approval of the Board of Directors**.
- **Implementation**: The scheme will be implemented through **Government e-Marketplace (GeM),** which shall provide an online functionality for the same.

- **Significance:** The scheme will boost developer and investor confidence, and will free up financial resources locked in disputes.

Vivad Se Vishwas scheme

- The Vivad Se Vishwas scheme was announced under Union Budget 2020 to reduce ongoing legal disputes **under direct taxation.**
- Around 150,000 cases were resolved with the recovery of about 54 percent of the amount under litigation. The scheme started in March 2020, and closed on March 31, 2021.

MASI Portal for Monitoring CHILD CARE HOMES

MASI Portal

- Monitoring App for Seamless Inspection (MASI) was developed for synchronous monitoring of the **Child Care Institutions** (CCIs) and their inspection mechanisms across the country.
- The **National Commission for Protection of Child Rights** (NCPCR) has developed this application.
- The effective and efficient functioning of the mechanism for inspection of CCIs provided **under the Juvenile Justice Act, 2015** (as amended in 2021).
- The app is linked to the monitoring Portal where the automatic reports are generated.
- This App enables unified **inspections by Child Welfare Committees** (CWCs), State Inspection Committees**, District Inspection Committees**, Members of Juvenile Justice Boards (JJBs) and **State Commissions for Protection of Child Rights** (SCPCRs) as laid down under the JJ Act, 2015.
- It serves as a single platform for inspections of all the CCIs across the country by any of the above stated authorities.
- Regular follow-up is done before and after the completion of cycle of inspection.
- The complete reports are automatically generated on the Portal as soon as the questionnaire is filled and submitted by the authority.

National Commission for Protection of Child Rights

- It is a **statutory body** established by an Act of Parliament, **the Commission for Protection of Child Rights (CPCR) Act, 2005.**
- It works under the aegis of **the Ministry of Women and Child Development.**
- **Mandate:** The Commission is mandated under section 13 of the CPCR Act, 2005 "to ensure that all Laws, Policies, Programmes, and Administrative Mechanisms are in consonance with the Child Rights perspective as enshrined in the Constitution of India and the UN Convention on the Rights of the Child."
- **Members:**
    - A **chairperson** who, is a person of eminence and has done outstanding

work for promoting the welfare of children.
- **Six members** were appointed by the Central Government out of which at least two are women, who are having experience in Education, Child Health, Juvenile justice Elimination of child labour, Child psychology or sociology Laws relating to children.
- The members are appointed by the Central Government **for a term of 3 years.**

Government introduces a new category of Ayush visa for foreign nationals seeking treatment under Indian systems of medicine

Ayush Visa:

- It is specifically **designed for foreign nationals** loo**king to receive medical treatment in India through traditional Indian systems of medicine**.
- This visa aims to **cater to those interested in** Ayurveda, Yoga, and other **traditional forms of therapeutic care** and wellness.
- **A new chapter, e., Chapter 11A**, **Ayush Visa, has been incorporated** after Chapter 11 - Medical Visa of the Visa Manual, which d**eals with treatment under the Indian systems of medicine,** and accordingly, necessary **amendments have been made in various chapters of the Visa Manual,** 2019.
- The introduction of the Ayush Visa category is **part of the country's roadmap for the Heal in India initiative.**
- **Heal in India initiative:** It seeks to **provide "integrated and holistic treatment" to the world in India** and enhance **patient mobility for access to world-class**, affordable, and quality **healthcare services".**

AYUSH

- AYUSH, which **stands for Ayurveda, Yoga, Unani, Naturopathy, Siddha, and Homoeopathy,** is an **acronym devised in 2003** to change the name of the Department of Indian Systems of Medicine and Homoeopathy (ISM & H).
- ISM & H was created in March 1995 under the Ministry of Health and Family Welfare.
- On November 9, 2014, the **government elevated AYUSH to a separate ministry**.

National Health Authority announces extension of its Digital Health Incentives Scheme till December 31, 2023

Digital Health Incentives Scheme (DHIS)

- The DHIS was **launched with effect from 1st January, 2023** as **part of the ABDM.**

- The scheme **aims to give a further boost to digital health transactions** in the country **under the ABDM.**
- The **incentives under this scheme would be provided to hospitals and diagnostic lab**s and also **to the providers of digital health solution**s such as Hospital/ Health Management Information System (HMIS) and Laboratory Management Information System (LMIS).
- Under the DHIS, the eligible health facilities and digital solutions companies **shall be able to earn financial incentives of up to Rs. 4 crores based on the number of digital health records they create and link to ABHA** (Ayushman Bharat Health Account).
- Incentives would be p**rovided to the following entities:**
    - **Health Facilities having 10 or more beds;**
    - L**aboratory/radiology diagnostics centres;**
    - **Digital Solution Companies** (entities providing ABDM enabled digital solutions);
- The incentives shall be provided **on the basis of the number of ABHA-linked transactions** e., the digital health records created and linked to ABHA.

National Health Authority (NHA)

- It is the a**pex body responsible for implementing AB PM-JAY.**
- **I**t has been entrusted with the r**ole of designing strategy, building technological infrastructure and implementation of "National Digital Health Mission " to** create a National Digital Health Eco-system.
- It is the s**uccessor of the National Health Agency**, which has been functioning as a registered society since 2018. Pursuant to Cabinet decision for full functional autonomy, National Health Agency was reconstituted as the National Health Authority in January 2019.
- **Structure:**
    - **An attached office of the Ministry of Health and Family Welfare** with full functional autonomy, NHA is **governed by a Governing Board chaired by the Union Minister for Health** and Family Welfare.
    - It is **headed by a Chief Executive Officer (CEO)**, an officer of the **rank of Secretary to the Government** of India, who manages its affairs.
    - The **CEO is the Ex-Office Member Secretary of the Governing Board.**
    - To implement the scheme **at the State level, State Health Agencies (SHAs)** in the form of a society/trust have **been set up by respective States.**

National Research Foundation Bill introduced in Lok Sabha

Anusandhan National Research Foundation Bill-2023

- It aims to **set up the Anusandhan National Research Foundation (NRF).**
- It will be an **apex body to provide high-level strategic direction of scientific research in the country** as per recommendations of the National

Education Policy (NEP).

- It **seeks to set up a Rs 50,000-crore fund**, with a sizeable **contribution from the private sector**, to "seed, grow and promote" research and development (R&D) and **foster a culture of research and innovation throughout India's universities**, colleges, research institutions, and R&D laboratories.
- **It seeks to set up different funds:**
    - **Anusandhan National Research Foundation Fund**: For the financing of activities under the Act.
    - **Innovation Fund:** For supporting outstanding creativity in the areas supported by the foundation
    - **Science and Engineering Research Fund:** For the continuation of the projects and programmes initiated under the Science and Engineering Research Board Act, 2008.
    - **One or more special-purpose funds** for any specific project or research.
- **Functions of NRF:**
    - NRF will **forge collaborations among the industry, academia, and government departments** and research institutions and **create an interface** mechanism for the participation and contribution of industries and state governments in addition to the scientific and line ministries.
    - It will **focus on creating a policy framework** and **putting in place regulatory processes that can encourage collaboration** and increased spending by the industry **on R&D**.
- **Structure of NRF:**
    - It will have a **governing board** consisting of **15 to 25 eminent researchers and professionals headed by the prime minister,** who will be the **ex-officio president.**
    - The **education minister** and the **science and technology Minister** will be the **vice presidents of the NRF.**
    - **The Department of Science and Technology** (DST) will be the **administrative department of NRF,**
    - The proposed foundation will also have an **executive council under the principal scientific adviser.**

Commerce Ministry seeking views of Ministries, NITI on draft Bills on five cash crops

The Commerce Ministry is seeking views from different Ministries and government think tank Niti Aayog on draft Bills pertaining to five cash crops like tea and tobacco.

- The Ministry has circulated separate notes for the Bills related to cash crops of tea, coffee, spices, rubber and tobacco, which seek to promote their growth and create a conducive environment for businesses by decriminalising minor

offences, the official said.

- After taking the comments, the Ministry will approach the Union Cabinet for approval on the drafts of **the Spices (Promotion and Development) Bill**; **the Rubber (Promotion and Development) Bill; the Coffee (Promotion and Development) Bill; the Tea (Promotion and Development) Bill; and the Tobacco Board (Amendment) Bill.**
- The Department of Commerce proposes the repeal of Tea Act, 1953; Spices Board Act, 1986; Rubber Act, 1947; Coffee Act, 1942 and updation of Tobacco Board Act, 1975.
- According to the draft Bills, the new proposed legislations reflect the present realities and objectives of these sectors. Explaining the rationale behind the proposal to repeal the Rubber Act, the draft Bill has stated that in recent years, there have been widespread changes in the industrial and economic scenario especially with regard to development in rubber and allied sectors.
- The draft Coffee (Promotion and Development) Bill has underlined that substantive portions of the existing Act dealing with pooling and marketing of coffee have become redundant/ inoperative.
- According to the draft Spices (Promotion and Development) Bill, 2022, there is a need to enable the Spices Board to provide focused attention across the entire supply chain of spices.
- The Ministry has proposed repeal of the archaic Tea Act as there is a paradigm shift in the recent decade with respect to the way tea is grown, marketed and consumed.
- Similarly, the draft Bill on tobacco has sought to update the existing law by promoting ease of doing business in the sector.

Ministry of Railways to establish Pradhan Mantri Jan Bhartiya

Pradhan Mantri Bhartiya Jan Aushadhi Kendras

- These are set up under **Pradhan Mantri Bhartiya Jan Aushadhi Pariyojana**, which was launched by the Department of Pharmaceuticals, Ministry of Chemicals and Fertilizers in November 2008.
- **Objective:** To provide quality medicines at affordable prices for all, particularly the poor, so as to reduce out-of-pocket expenses in healthcare.
- They **provide generic drugs,** which are available at lesser prices but are equivalent in quality and efficacy as expensive branded drugs. All therapeutic medicines are made available from Jan Aushadhi Stores.
- Jan Aushadhi stores also sell allied medical products commonly sold in chemist shops so as to improve the viability of running the Jan Aushadhi store.
- **Pharmaceutical & Medical Devices Bureau of India** (PMBI) has been established under the Department of Pharmaceuticals, Govt. of India, with the support of all the CPSUs for co-coordinating procurement, supply, and marketing of generic drugs through the PMBKs.
- **Who can open a Jan Aushadhi Kendra?**

- **State Governments** or any organization / reputed NGOs / Trusts / Private hospitals / charitable institutions / Doctors / Unemployed pharmacists/ individual entrepreneurs are eligible to apply for the new Jan Aushadhi Kendra.
- The applicants shall have to employ one B Pharma / D Pharma degree holder as Pharmacist in their proposed store.

14 States yet to join Centre's flagship education scheme

Pradhan Mantri Uchchatar Shiksha Abhiyan

- In the light of the National Education Policy, **Rashtriya Uchchatar Shiksha Abhiyan** (RUSA) scheme has been launched as Pradhan Mantri Uchchatar Shiksha Abhiyan (PM-USHA).
- It covers government and government-aided institutions of the States and UTs.
- It is a **Centrally Sponsored Scheme (CSS).**
- PM-USHA would be focusing on the following:
  - **Equity, Access, and Inclusion:** The scheme **focuses on equity initiatives and gender inclusion by providing adequate opportunities** to underprivileged groups, and it promotes the inclusion of women, minorities, SCs/STs/OBCs, and specially-abled people in higher education, which will help to increase the GER
  - **Developing Quality Teaching & Learning processes:** It would provide the facilities to the **institution for upgrading the physical and digital infrastructure** and also for the conversion of single-stream higher education institutions (HEIs) into multiple streams institutions
  - **Accreditation of Non-Accredited Institutions & Improving Accreditation:** Accreditation pushes institutions to meet and maintain higher standards in education, in turn, increases trust and confidence in them among the public and boosts accountability
  - **ICT-based Digital Infrastructure:** To ensure greater access to education, there is the significant importance of technology in bridging the language barrier between teachers and students, creating digital libraries, popularizing language learning as well as introducing the Open distance learning (ODL) programs.
  - **Enhancing Employability through Multidisciplinarity :** Collaboration between industry and academia is key to catalysing innovation and growth in career building. PM-USHA will encourage the HEIs to get linked with the Industry and the Market to strengthen skills, innovations, and employability

Invoke pre-trial detention only to maintain public order: Kerala HC

Preventive Detention

- Preventive detention refers to the **detention of an individual without a trial or conviction by a court.**
- **The primary objective** of preventive detention **is not to punish an individual for a past offence but to prevent them from committing an offence in the future.**
- Preventive detention laws are **enacted by governments to ensure public safety and maintain social order.**
- **Constitutional Provisions and Safeguards:**
    - **Article 22** of the Indian Constitution **grants protection to individuals who are arrested or detained.**
    - It **has two parts**—the **first part deals with cases of ordinary law**, which includes situations where an individual is detained as part of a criminal investigation.
    - The **second part deals with cases of preventive detention law**, which pertains to the detention of individuals without a trial or conviction.
    - **Article 22 (4)**states that **no law providing for preventive detention shall authorise the detention of a person for a longer period than three months unless an Advisory Board reports sufficient cause for extended detention.**
    - The **detainee is entitled to know the grounds of his detention**. **The state, however, may refuse to divulge the grounds of detention if it is in the public interest** to do so.
    - The **detaining authorities must give the detainee earliest opportunities for making representation** against the detention.
- **Who can make laws under Preventive Detention?**
    - **Parliament has the exclusive power to enact a law** for preventive detention for the **reasons connected with defence, foreign affairs, or security of India.**
    - **Both Parliament and State Legislature have powers to enact a law** for preventive detention **for the reasons related to the maintenance of public order or the maintenance of supplies or services essential to the community.**
- **Laws that provide for Preventive Detention**:
    - In India, various laws provide for preventive detention, including the **National Security Act (NSA) of 1980**, the **Unlawful Activities (Prevention) Act (UAPA) of 1967**, and **state-specific laws like the Maintenance of Internal Security Act (MISA**) and the Public Safety Acts (PSA) in certain states.
    - Under these laws, **authorities can detain an individual for a specific period**, typically up to 12 months, without presenting formal charges or conducting a trial.
    - The **detention order is issued by a designated authority or government official and is subject to periodic revie**w by an advisory board.

ODOP teams up with DAY-NRLM to introduce 'ODOP Wall' showcasing India's unique artistry

One District One Product wall

- The One District One Product (ODOP) program is an initiative **under the Department for Promotion of Industry and Internal Trade (DPIIT)**, Ministry of Commerce & Industry,
- Under this **Collaboration- products are being identified from all districts to be promoted** for their unique qualities and cultural significance which include various handicrafts, handloom, and agricultural products that have been associated with the identity of their place of origin.
- **Objectives of ODOP:** To help districts reach their full potential, foster economic and socio-cultural growth, and create employment opportunities, especially, in rural areas.
- This initiative aims to **turn every district in India, into an export hub** through promotion of the product in which the district specialises.
- The initiative plans to accomplish this by scaling manufacturing, supporting local businesses, finding potential foreign customers and so on, thus helping to achieve the 'Atmanirbhar Bharat' vision.

DAY-NRLM

- It is one of **the flagship poverty alleviation program.**
- **It** aims at creating efficient and **effective institutional platforms** for the rural poor, enabling them to increase household income through sustainable livelihood enhancements and improved access to financial services.
- **Key Features:**
    - **Universal Social Mobilisation:** At least one woman member from each identified rural poor household, is to be brought under the Self Help Group (SHG) network in a time bound manner.
    - **Participatory Identification of Poor (PIP):**All households identified as poor through the PIP process is the NRLM Target Group and is eligible for all the benefits under the programme.
    - **Community Funds as Resources in Perpetuity:** NRLM provides Revolving Fund (RF) and Community Investment Fund (CIF) as resources in perpetuity to the institutions of the poor, to strengthen their institutional and financial management capacity.

Centre pushes for faster admission of IBC cases at NCLT

National Company Law Tribunal

- It is **a quasi-judicial authority** incorporated for **dealing with corporate disputes** that are of civil nature arising under the Companies Act,2013.
- It was constituted on 1 June 2016 under **the Companies Act,2013.**

- It was established based on the **recommendation of the Balakrishna Eradi committee** on law relating to the insolvency and the winding up of companies.
- **Composition:** It shall consist of a President and such number of Judicial and Technical Members as may be required.
- **What are the Powers of NCLT?**
    - It is not limited or bound by the rules laid down in the Code of Civil Procedure and **is guided by the principles of natural justice**, subject to the other provisions of this Act and of any rules that are made by the Central Government.
    - It can **enforce any order** that it gives in the same manner as a court would enforce it.
    - It has the **power to scrutinize its own orders**.
    - It has the power to regulate their own procedure.
    - It is the adjudicating authority for the insolvency resolution process of companies and limited liability partnerships under the Insolvency and Bankruptcy Code, 2016.

NPC favours offering incentives for buying & selling power on PUShP portal

PUShP portal

- A **High Price Day Ahead Market (HP-DAM) and Surplus Power Portal** (PUShP) was **launched by the Ministry of Power.**
- It was launched to ensure **greater availability of power during the peak demand season** at a price higher than the ceiling of Rs 12 per unit by certain category of sellers.
- The power distribution companies (DISCOMs) will be **able to indicate their surplus power in block times / days / months on portal.**
- Those DISCOMs who need power will be able to requisition the surplus power.
- The new buyer will pay both variable charge (VC) and fixed cost (FC) as determined by Regulators. Once power is reassigned, the original beneficiary shall have no right to recall as entire FC liability is also shifted to the new beneficiary.
- This **will reduce the fixed cost burden on the DISCOMs**, and will also enable all the available generation capacity to be utilized.

Day Ahead Market

- It is a physical electricity trading market where **power is delivered within 24 hours of the next day starting from midnight.**
- They are traded in 15 minute time blocks and the prices and quantum of electricity closed the auction bidding process.

Performance Audit Report on National Social Assistance Programme

National Social Assistance Programme

- It was launched on 15th August, 1995.
- **Objective**
  - It is is a **social security and welfare programme** to provide support to aged persons, widows, disabled persons and bereaved families on death of primary bread winner,belonging to below poverty line households.
- **Eligibility**
  - For getting benefits under NSAP the applicant **must belong to a Below Poverty Line (BPL) family a**ccording to the criteria prescribed by the Govt. of India.
  - The other eligibility criteria and the scale of central assistance under the sub - schemes of NSAP are as follows
- Presently NSAP **comprises of five schemes**, namely –
  - **Indira Gandhi National Old Age Pension Scheme (IGNOAPS):** The eligible age for IGNOAPS is 60 years. The pension is Rs.200 p.m. for persons between 60 years and 79 years. For persons who are 80 years and above the pension is Rs.500/ - per month.
  - **Indira Gandhi National Widow Pension Scheme (IGNWPS):** Widow aged 40 years will get pension is Rs.300 per month. After attaining the age of 80 years, the beneficiary will get Rs.500/ - per month.
  - **Indira Gandhi National Disability Pension Scheme (IGNDPS):** An individual aged 18 years and above and the disability level has to be 80% wil get Rs.300 per month and after attaining the age of 80 years, the beneficiary will get Rs 500/ - per month.
  - **National Family Benefit Scheme NFBS) :** In the event of death of the bread – winner Rs. 20000/ - will be given as a lumpsum assistance to the bereaved household. The breadwinner should have been between 18-60 years of age.
  - **Annapurna:** The scheme aims at provide food security to meet the requirements of those eligible old aged persons who have remained uncovered under the IGNOAPS. Under this **programme 10 kgs of food grains (wheat or rice)** is given per month per beneficiary.
- **Nodal Ministry:** Ministry of Rural Development

MeitY launches Indian Web Browser Development Challenge

India Web Browser Development Challenge (IWBDC)

- The challenge is **spearheaded by MeitY** in **collaboration with the Controller of Certifying Authorities (CCA)** and the **Centre for Development of Advanced Computing (C-DAC)** Bangalore.
- The Challenge **seeks to inspire and empower technology enthusiasts, innovators**, and developers from all corners of the country **to create an**

indigenous web browser.

- The desired browser **will have its own trust store**, **use a root certificate from India's CCA**, and **offer cutting-edge functionalities** and **enhanced security & data privacy protection features.**
- As part of the challenge the government has announced a **cash prize of Rs 3.4 crores for the developers.**
- **Qualifications for Participants:**
    - The Indian Tech **Start-ups, MSMEs**, **Companies, and LLPs registered in India under the Companies Act 2013 can apply.**
    - The **entity must have at least 51% shareholding with Indian citizens** or persons of Indian origin.
    - The applicant's entity **should not be a subsidiary company of any foreign corporation.**
    - **Participants can apply either as "individuals" or "organization**". Members applying as "**individuals" should have a minimum of 3 and a maximum of 7 members** in their Group.
    - **All other applicants** (Startups, MSME, etc.) **should apply under the "organization"** category only.
- **Desired features in an Indian web browser:** The **ministry has also laid down** the **features desired** in an Indian web browser.
    - It must be **compatible with all platforms,** including iOS, Android and Desktop.
    - It should **offer built-in accessibility support**.
    - The browser should also have the **ability to digitally sign the documents using a crypto token.**
    - It should also have **parental control and a web filter for child-friendly browsing**.
    - It should come **with support for Web3 and compliance with W3C standards**.
    - Lastly, it should also **support all the official Indian languages**.

Controller of Certifying Authorities (CCA)

- The **Information Technology Act 2000 (IT Act) provides for the CCA**.
- **Function**: To **license and regulate the working of Certifying Authorities (CAs)**.
- The **CAs issue digital signature certificates for electronic authentication of users.**
- The CCA **also maintains the National Repository of Digital Certificates (NRDC),** which **contains all the certificates issued by all the CAs** in the country.
- Its **aim is to promote the growth of e-Commerce and e-Governance through a wide use of digital signatures.**
- The Controller of Certifying Authorities (CCA) **is appointed by the Central Government under section 17 of the IT Act.**

Modi Cabinet approves 'PM-eBus Sewa' for augmenting city bus operations; scheme to cost Rs 57K cr

'PM-eBus Sewa' Scheme

- Under the PM-eBus Sewa Scheme, **10,000 e-buses will be deployed across cities in the country.**
- **Support for Operation:**
  - Under this scheme, **city bus operations will be done on a Public Private Partnership** (PPP) model.
  - This scheme will **support bus operations for 10 years**.
  - **States/Cities shall be responsible for running the bus services and making payments to the bus operators.**
  - The **Central Government will support these bus operations by providing subsidy** to the extent specified in the proposed scheme.
- **Funding**:
  - It has been allocated a **total funding of Rs 57,613 crore**.
  - Out of this financial provision, the **central government will contribute Rs 20,000** crore, while the **remaining portion will be covered by the state governments**.
- **Coverage**: The scheme will **cover cities with 3 lakhs and above population** and priority will be given to cities not having organised bus services.
- **There are two segments of the scheme**: Augmenting the city bus services and Green Urban Mobility initiatives.
- **Augmenting the city bus services:**
  - Under this, the **e-buses will operate under the PPP model** and **the government will help develop associated infrastructure** to provide support for development/upgradation of depot infrastructure
  - It will also **help cities create behind-the-meter power infrastructure** for the e-buses.
- **Green Urban Mobility initiatives:**
  - **Bus rapid transport projects would be developed along with non-motorised infrastructure** like bike sharing, bicycle lanes.
  - **Innovative projects like National Common Mobility Card, Intelligent Transit Management System**, Multimodal Interchange facilities would also be developed.

NCLAT grants 3 weeks to RBI for reply on Adisri plea against Srei firms' resolution

National Company Law Appellate Tribunal (NCLAT)

- It was **constituted under Section 410 of the Companies Act, 2013**for **hearing appeals against the orders of the National Company Law Tribunal(s) (NCLT)**, with effect from 1st June 2016.
- The NCLAT was established to **provide an efficient and specialized forum**

for addressing matters related to company law, insolvency, and competition law.

- **Objectives**:
  - **Hear appeals against the orders passed by NCLT(s)** under Section 61 of the Insolvency and Bankruptcy Code, 2016 (IBC).
  - **Hear appeals against the orders passed by Insolvency and Bankruptcy Board** of India under Section 202 and Section 211 of IBC.
  - To **hear and dispose of appeals against any direction** issued or decision made or order **passed by the Competition Commission of India (CCI).**
  - It is also the **Appellate Tribunal to hear and dispose of appeals against** the **orders of the National Financial Reporting Authority.**
- **HQ: New Delhi.**
- **Composition:**
  - It is **composed of a chairperson and judicial and technical members**.
  - These members are **appointed by the Central Government** based on their expertise and experience in relevant fields such as law, finance, accountancy, management, and administration.
- **Disposing of cases:**
  - **On the receipt of an appeal** from an aggrieved person, the Appellate Tribunal would **pass such orders, after giving an opportunity of being heard**, as it considers fit, confirming, changing or setting aside the order that is appealed against.
  - The Appellate Tribunal is **required to dispose of the appeal within a period of six months** from the date of the receipt of the appeal.

'PM Vishwakarma' gets Cabinet approval; Rs 13,000 cr scheme likely to benefit 30 lakh families

PM Vishwakarma Yojana

- It is a **Central Sector Scheme** with a financial outlay of Rs.13,000 crore.
- **Time period:** Five years (FY 2023-24 to FY 2027-28).
- **Aim:**
  - To **strengthen and nurture the Guru-Shishya parampara or family-based practice of traditional skills** by artisans and craftspeople working with their hands and tools.
  - The scheme also aims at improving the quality, as well as the reach of products and services of artisans and craftspeople and to ensure that the Vishwakarmas are integrated with the domestic and global value chains.
- Under this scheme, the artisans and craftspeople will be provided recognition through **PM Vishwakarma certificate and ID card, Credit Support upto Rs.1 lakh (First Tranche) and Rs.2 lakh (Second Tranche)** with a concessional interest rate of 5%.

- The Scheme will further provide Skill Upgradation, Toolkit Incentive, Incentive for Digital Transactions and Marketing Support.
- Under the scheme, there will be two types of skilling programmes -- Basic **and Advanced and a stipend of Rs 500 per day** will also be provided to beneficiaries while undergoing skills training.

69,523 grievances redressed by states in July, Sikkim tops north eastern region in complaint disposal

- DARPG has **integrated the AI based language tool, Bhashini with the CPGRAMS portal**.
- This integration **would facilitate the Grievance Redressal Officers** (GROs) to translate the **regional language grievance texts into English**.
- The complainants will have the option to view **the final reply in both English and** the translated native language, ensuring better understanding and communication between the citizen and the concerned authorities.

CPGRAMS

- Centralised Public Grievance Redress and Monitoring System (CPGRAMS) **is an online platform available to the citizens 24x7** to lodge their grievances to the public authorities on any subject related to service delivery.
- It is a **single portal connected** to all the Ministries/Departments of Government of India and States.
- Every Ministry and States have role-based access to this system.
- CPGRAMS is also accessible to the citizens through standalone mobile application downloadable through Google Play store and mobile application integrated with UMANG.
- The status of the grievance filed in CPGRAMS can be tracked **with the unique registration ID provided** at the time of registration of the complainant.
- CPGRAMS also provides an appeal facility to the citizens if they are not satisfied with the resolution by the Grievance Officer.

'A-HELP' Programme and Infertility Camp for Livestock under Inclusive Development at Narmada, Gujarat launched by Shri Parshottam Rupala

A-HELP' Programme

- It is an initiative of **the Union Ministry of Fisheries, Animal Husbandry & Dairying and the Ministry of Rural Development.**
- 'A-HELP' are **community-based women activists**, who assist veterinarians in local departmental activities help livestock farmers to take loans for entrepreneurship development, fill out applications, mark the ear tagging of animals and register them in the INAF portal and help with insurance etc.

- They **assist in implementing various schemes** and in providing information to the farmers at the grassroots level.
- They will give vital contributions to preventing various infectious diseases of animals, artificial insemination **under the Rashtriya Gokul Mission** (RGM), tagging animals and animal insurance.

Rashtriya Gokul Mission

- It is being implemented for the development and conservation of indigenous bovine breeds since December 2014.
- It is continued under the umbrella scheme Rashtriya Pashudhan Vikas Yojana from 2021 to 2026.
- **Objectives**
- To **enhance the productivity of bovines** and increase milk production in a sustainable manner using advanced technologies.
- To propagate the **use of high genetic merit bulls** for breeding purposes.
- To enhance **Artificial insemination coverage** through strengthening the breeding network and delivery of Artificial insemination services at farmers' doorstep.
- To **promote indigenous cattle & buffalo** rearing and conservation in a scientific and holistic manner.

INCOIS launches 'SAMUDRA' mobile app for seafarers and fishing community

SAMUDRA App

- Smart Access to Marine Users for Ocean Data Resources and Advisories (SAMUDRA) application offers comprehensive **information on all ocean related services.**
- It is a cutting-edge tool helping users to navigate the marine domain with confidence on their **safety, and profitable fishing operations.**
- It embodies the institute vision and mission in serving the nation with ocean data, information, and advisory services.
- It will **catalyse sustainable ocean activities**, thus enabling a way forward for the Blue Economy,
- It empowers users **with real-time updates and critical alerts on oceanic disasters** such as tsunamis, storm surges, high waves, and swell surge alerts, for the individuals and communities to stay informed and take necessary precautions towards the protection of lives and property.
- It will be especially beneficial to the fishing community as **it disseminates Potential Fishing Zone (PFZ)** advisories which will guide them to the probable fish aggregation locations.
- It is **currently serving in English**, soon eight coastal languages are proposed to be included soon.

INCOIS

- It was established as an **autonomous body** in 1999 under **the Ministry of Earth Sciences (MoES).**
- **Mandate:** To provide the best **possible ocean information and advisory services** to society, industry, government agencies and the scientific community through sustained ocean observations and constant improvements through systematic and focused research.

The gaps in the Births and Deaths Registration (Amendment) Act

The Registration of Births and Deaths (RBD) Act, 1969 provides for compulsory registration of births and deaths under a uniform law across India. Experience of its working indicates that it is necessary to amend it for several reasons, and things could be changing as a Bill to amend this Act — called the Registration of Births and Deaths (Amendment) Bill, 2023 — for the first time since its inception, has been passed by Parliament and has got the assent of the President of India.

The Registration of Births and Deaths (RBD) Act, 1969:

- **It provides for compulsory registration** of births and deaths under a uniform law across India.
- **Registration of Births and Deaths in India is mandatory** with the enactment of RBD, Act 1969 and is done as per the place of occurrence of the event.
- **It is the responsibility of the States** to register births and deaths.
- **State governments have set up facilities for registering** births and deaths and keeping records.
- **A Chief Registrar appointed in every State** is the executive authority for implementation of the Act.
- **A hierarchy of officials at the district and lower levels** do the work.
- **The RGI, appointed under this Act**, is responsible for coordinating and unifying the implementation of the RBD Act.

Need for New Bill:

- **To create a National and State level database** of registered births and deaths
- **It would help in updating other databases** resulting in efficient and transparent delivery of public services and social benefits".

Provisions

- **The Bill makes it compulsory** that the Registrar General of India maintains a national level database of births and deaths
- **The Chief Registrar of births and deaths in every State** is required to maintain a State-level database of registered births and deaths 'using the portal approved by the Registrar General of India'.
- **The databases are to provide information** to update the National

Population Register, the Aadhaar database, electoral rolls, ration card, passport, and other databases at the national level, as may be notified.
- **In the case of birth: The** amendments provide for collecting the Aadhaar number of the parents.
    - **Nothing is mentioned** about the Aadhaar number of the deceased.

Background

- **The registration hierarchy** is the responsibility of State governments, with the Registrar General of India having only the role of coordination and unification of the registration system.
- **The maintenance of the central database is being added to the Registrar General** of India's functions.
    - **The Chief Registrars are the executive authorities** for the matters relating registration of births and deaths in the States.
    - **They need to maintain a database** for efficient delivery of services of providing birth and death certificates.

National Database:

- **The national database will be a collection of State-level databases,** except for some data items that some States may have in addition to the national standards prescribed by the Registrar General of India.
- **If the authorities maintaining other databases r**equire information on births and deaths
    - **It will be possible to design a system** wherein the required data flow to their databases on a daily basis or even a real time basis from the State-level database.

Need for a national-level database

- **It is provided that database at the central level** be made available to authorities dealing with the maintenance and preparation of databases relating to
    - population register
    - electoral rolls
    - Aadhaar number
    - ration card
    - passport
    - driving license
    - property registration
    - other databases at the national level, as may be notified.
- **If authorities require information** from the database of registered births and deaths to update their databases
    - **It requires amendment in the laws or executive orders** under which they are maintained.
- **The RBD Act needs an enabling provision** to share information from the

database.

Issues:

- **New additions to the list later may be more dangerous** than those listed and approved by Parliament.
    - **For example, the government can now decide that a list of women** whose third or higher order birth is being registered be prepared and given to the Family Welfare department for follow up on family planning programmes.

Certificate of cause of death

- **Presently, the State government** decides that a cause of death certificate should be issued by the medical practitioner who attended the deceased person
- **The areas/hospitals where such a certificate** has been made mandatory varies across States
    - **but is generally restricted to deaths** in medical institutions.
- **The amendments** make it compulsory that for all deaths in medical institutions
    - **A cause of death certificate** is sent to the **Registrar of Births and Deaths** and a copy of the certificate is provided to the closest relative.
    - **For deaths that occur outside hospitals,** the medical practitioner who attended to the deceased during the person's recent illness has to issue such a certificate.

Associated Issues with the amendment in certification of cause of death:

- **The medical practitioner** may not have always arrived at a definite diagnosis before the person died.
- **The forms for cause of death** that are being used are in conformity with World Health Organization recommendations.
    - **If the deceased was attended by a practitioner of the AYUSH systems of medicine: The** cause of death recorded may not be usable for cause of death statistics
    - **since they may not be classifiable** under the International Classification of Diseases.
- **A person who was under treatment for a certain disease** can die of an entirely different cause outside a medical facility when the medical practitioner was not available for consultation.
    - **How can the practitioner** be expected to issue a certificate of cause of death in such cases?
- **Section 17 of the Act** prohibits the inclusion of cause of death in any certificate issued under the Act
    - **It now says that the cause of death certificate** should be given to the relative of the deceased.
    - **These are contradictory as the cause of death in the death register**

is taken from the same cause of death certificate issued by the medical practitioner

Jan Dhan accounts cross 50 crore-mark in less than 9 years

Pradhan Mantri Jan Dhan Yojana (PMJDY)

- PMJDY is a **National Mission for Financial Inclusion** launched in **August 2014** to **ensure access to financial services,** namely, Banking/ Savings & Deposit Accounts, Remittance, Credit, Insurance and Pension, **in an affordable manner.**
- It **envisages universal access to banking facilities with at least one basic banking account for every household**, financial literacy, access to credit, insurance and pension.
- The plan also **envisages channelling all Government benefits** (from Centre / State / Local Body) **to the beneficiary's accounts and pushing the Direct Benefits Transfer** (DBT) **scheme** of the Union Government.
- **Eligibility:**
    - The applicant should be an **Indian National.**
    - Any individual above **10 years** can open a bank account.
    - **If minors above ten years apply**, they will **require support from their legal guardians to administer their PMJDY account**.
- **Jan Dhan Account:**
    - **An individual can consider opening an account** under this scheme **with any bank branch or Business Correspondent (Bank Mitr) outlet.**
    - Further, accounts opened under PMJDY **can be opened with zero balance.**
    - However, **if the account holder wishes to get a chequebook**, he/she will **have to fulfil the minimum balance criteria.**
    - The account holders under this scheme **will be given a RuPay debit card which can be used across all ATMs for cash withdrawal.**
- Individuals opening a Jan Dhan account are **subject to be recipients of certain benefits. They are**
    - **Accidental Insurance Cover**:
        - It provides a**ccidental insurance of ₹1,00,000 to the holders of non-premium cards**, while those with **premium cards can avail up to ₹2,00,000.**
        - People **holding a RuPay Debit Card under PMJDY will be eligible** for this insurance.
    - **Life Cover Insurance:**
        - The **holders of a RuPay Debit Card under the scheme** can also **receive life cover insurance up to ₹30,000.**
        - It will **only apply to people opening bank accounts for the first time** under Jan Dhan Yojana with a debit card.
        - The **person should also be the head of the family or a major**

earning member.
    - This scheme will be **liable to a single payment of ₹30,000 upon the death of a beneficiary.**
    - **State or Central Government employees, public sector employees**, and **people with taxable income will not be eligible** for life cover insurance under Jan Dhan Yojana.
  - **Overdraft Facility:** Beneficiaries can avail of an **overdraft facility for up to ₹10,000.** However, this is **only available against one account per household**.
  - This scheme also **provides loans of up to ₹5,000 to beneficiaries after completing six months of account transactions.**

Cabinet approves investment of ₹1.3 lakh crore in Bharat Net

BharatNet Project

- The **National Optical Fibre Network (NOFN**), **launched in October 2011**, was **renamed the Bharat Net Project in 2015.**
- It is an ambitious project of the Government of India **to provide broadband connectivity to all village panchayats in the country.**
- It aims to **provide affordable broadband connectivity of 2 Mbps to 20 Mbps for all households** and on-demand capacity to all institutions to realize the vision of Digital India**, in partnership with States and the private sector.**
- The objective is to **facilitate the delivery of e-governance, e-health**, e-education, e-banking, Internet and **other services to rural India.**
- To achieve this, the **existing fibres of PSUs** (BSNL, Railtel and Power Grid) **were utilised and incremental fibre was laid** to connect to Gram Panchayats **wherever necessary.**
- The entire project is **being funded by the Universal service Obligation Fund (USOF)**, which was set up to improve telecom services in rural and remote areas of the country.
- The project is being **executed by a Special Purpose Vehicle (SPV), namely Bharat Broadband Network Limited (BBNL),** which was incorporated on 25.02.2012 under Indian Companies Act 1956.

Universal Service Obligation Fund (USOF)

- It is a **government fund** established by the Government of India **to provide financial support for the expansion of telecommunications and broadband services in rural** and remote **areas of the country**.
- The **primary objective of USOF is to bridge the digital divide** and ensure that telecom and internet services are accessible to all, especially in areas where private telecom operators may find it economically unviable to operate due to high infrastructure costs and low population density.
- **Funding Mechanism:**
  - The USOF is **funded through a levy on the revenue earned by**

telecom operators.
    - The **government imposes a Universal Service Levy (USL) on the gross revenue of the telecom companies**, which is a percentage of their Adjusted Gross Revenue (AGR).
    - **This levy is collected and deposited into the USOF.**
- The USOF is **managed by the Department of Telecommunications (DoT)** under the Ministry of Communications.

Home Minister Amit Shah to launch digital portal of Central Registrar of Cooperative Societies office in Pune

Digital Portal of the Central Registrar of Cooperative Societies (CRCS)

- It is **aimed at promoting ease of doing business in the cooperative sector** and streamlining various processes.
- **Objectives**: Implementing completely **paperless applications**, ensuring **automatic compliance with the Multi-State Co-operative Societies Act (MSCS Act)** and rules **through software**, enhancing the ease of doing business, enabling **digital communication, ensuring transparent processing**, and improving analytics and management information system.
- This project of computerization will prove particularly **helpful in the registration of new Multi-State Cooperative Societies**, **simplifying their operations** and creating a more efficient and transparent digital ecosystem.
- **Features**:
    - The digital portal will **encompass various modules**, including **registration, amendment of bye-laws, annual return filing**, **appeal, audit, inspection**, inquiry, arbitration, winding up, liquidation, ombudsman, and election.
    - It will also **incorporate the recently passed amendments** to the Multi-State Cooperative Societies (MSCS) Act, 2002, and its rules.
    - The portal will **expedite the processing of applications and service requests through electronic workflow**, facilitating a time-bound approach.
    - It will **also feature provisions for OTP-based user registration, validation checks to ensure compliance with the MSCS Act and Rules**, hearing through video conferencing, issuance of registration certificates, and electronic communication, read the release.

Central Vigilance Commission reconstitutes advisory board on bank frauds

Advisory Board on Banking and Financial Frauds

- It conducts **the first level examination of bank frauds** before recommendations or references are made to investigate by agencies such as the Central Bureau of Investigation (CBI).

- **Composition:** It consists of **the Chairman and four other members,** and the **tenure** of the Chairman/ Members **would be for two years.**
- It has been empowered to examine **the role of officials/whole-time directors** (including ex-officials/ex-whole-time directors) in **public sector banks, public sector insurance** companies, and public sector financial institutions in case of frauds amounting to ₹ 3 crore and above.
- The **Central Vigilance Commission or the Central Bureau of Investigation** (CBI) can also refer any case or **technical matter to the board** for its advice, the order stated.
- The board can also **give inputs for policy formulation related to fraud** to the Reserve Bank of India and the Central Vigilance Commission.
- It will ordinarily, within a month of receipt of the initial reference, tender its advice as may be requisitioned by ministries, departments, the Central Vigilance Commission or the CBI.

Central Vigilance Commission

- It was set up by the Government in 1964 on **the recommendations of the** Committee on Prevention of Corruption, headed **by K. Santhanam.**
- It is a statutory body governed by the **Central Vigilance Commission Act 2003.**
- The CVC is **not controlled by any Ministry/Department**. It is responsible to the Parliament.
- **Mandate:** To inquire into offences alleged to have been committed under the Prevention of Corruption Act, 1988 by certain categories of public servants of the Central Government, corporations established by or under any Central Act, Government Companies, societies and local authorities owned or controlled by Central Government.
- **Composition:** The Commission shall consist of a Central Vigilance Commissioner (Chairperson); and not more than two Vigilance Commissioners (Members).
- **Appointment:** They are appointed by the President on the recommendation of a Committee consisting of the Prime Minister (Chairperson), the Minister of home affairs and the Leader of the Opposition in the Lok Sabha.
- **Term:** The term of office of the chairperson and the **members is four years** from the date on which they enter their **office or till they attain the age of 65 years,** whichever is earlier. Central Vigilance Commission reconstitutes advisory board on bank frauds.

Centre Sets Up High Powered 9-Member Committee To Review DRDO's Activities, Report Expected In 3 Months

Defence Research and Development Organisation (DRDO)

- It is the **R&D wing of the Ministry of Defence**, Govt of India, with a vision **to empower India with cutting-edge defence technologies** and a mission to **achieve self-reliance in critical defence technologies** and systems.

- It is **India's largest research organisation.**
- **Formation**: The organisation was **formed in 1958 from the amalgamation of** the then already functioning **Technical Development Establishment (TDEs) of the Indian Army and the Directorate of Technical Development & Production (DTDP) with the Defence Science Organisation (DSO).**
- **Headquarters: New Delhi.**
- It **has a network of laboratories engaged in developing defence technologie**s covering various fields, like aeronautics, armaments, electronics, land combat engineering, life sciences, materials, missiles, and naval systems.
- **Major Projects:**
    - DRDO's **first projec**t for the Indian military **was in surface-to-air missiles (SAM) known as Project Indigo.** However, it received little success and was therefore discontinued.
    - Since being set up, DRDO has ac**hieved many successes in developing major systems** and critical technologies **like aircraft avionics, UAVs, small arms, artillery systems,** EW Systems, tanks and armoured vehicles, sonar systems, command and control systems and missile systems.
    - **In 2016, It successfully tested its first indigenously developed heavy-duty drone, Rustom 2,** which is an unmanned armed combat vehicle developed on the lines of the US's Predator drone.
    - **DRDO co-developed INS Arihant**, **India's first nuclear ballistic missile submarin**e, which became operational in 2018.
    - **In March 2019, DRDO developed India's first anti-satellite system** that made India one of the space superpowers.
    - DRDO has also **developed several ballistic missiles under its Integrated Guided Missile Development Programm**e, which includes missiles like **Prithvi, Trishul, Agni, Akash and Nag.**

First ABDM microsite under NHA '100 microsites project' launched in Mizoram

Microsites project

- These are defined **geographical regions** where focused outreach efforts would be made to **onboard small and medium-scale private healthcare providers.**
- Types of **facilities to be covered** under a Microsite:
    - **Private facilities such as standalone clinics**, polyclinics, nursing homes, small hospitals (preferably <10 beds), labs, pharmacies, and any other healthcare facilities wherein health records are generated.
    - **Health Facilities and Health Professionals** from all the systems of medicine.
- **Categories of a Microsite:** Any State/UT can choose to implement any of the following categories of Microsites as per the regional priorities.
    - **Category A Microsite:** A microsite which consists of at least 1000 facilities, inclusive of all types of health facilities, as mentioned above

    - **Category B Microsite:** A microsite that consists of at least 500 facilities but less than 1000 facilities, inclusive of all types of health facilities, as mentioned above.
- **Implementation:**
    - These Microsites would be **majorly implemented by State Mission Directors of ABDM,** while the financial resources and overall guidance would be provided by NHA.
    - An interfacing agency under this program will have **an on-ground team to reach out to the healthcare providers** in the area.
    - This team will spread awareness about the benefits of ABDM. It will help the service providers to join the core registries under ABDM, besides promoting the use of ABDM to enable digital solutions for regular clinical documentation.
    - Patients will be able to link the health records generated at these facilities with **their Ayushman Bharat Health Accounts** (ABHAs). They will be able to view and share these records using any ABDM-enabled Personal Health Record (PHR) application on their phones.

Government to launch 'Mera Bill Mera Adhikar' GST reward scheme in six States, UTs from September 1

Mera Bill Mera Adhikar Scheme

- It is a Goods and Services Tax (GST) **invoice incentive programme** that **offers cash incentives for uploading invoices.**
- It would **initially be introduced** in the states of **Assam, Gujarat, and Haryan**a, as well as the UTs of **Puducherry, Daman & Diu**, and **Dadra & Nagar Haveli.**
- **Objective**: To **encourage customers to request a bill** whenever they make purchases.
- **How does the scheme work?**
    - **All invoices issued by GST-registered suppliers to consumers will be eligible** for the scheme.
    - **A monthly and quarterly draw of lots** will be made, and **winners will be eligible for cash reward** prizes beginning **from Rs 10,000 to up to Rs 1 crore.**
    - The **minimum purchase value** f**or the invoice** to be considered for the lucky draw **is Rs 200, and individuals can upload a maximum of 25 invoices in a month.**
    - The '**Mera Bill Mera Adhikar' mobile app will be made available** on both IOS and Android platforms.
    - The **invoice uploaded on the app should have the GSTIN of the seller, invoice number, amount paid and tax amount.**

NCDRC dismisses Cloudtail's appeal in pressure cooker case

National Consumer Disputes Redressal Commission

- It is a **quasi-judicial commission** in India, which was set up in 1988 under **the Consumer Protection Act of 1986.**
- The Commission is **headed by a sitting or a retired Judge of the Supreme Court of India** or a sitting or retired Chief Justice of the High Court.
- The Act mandates the establishment of **Consumer Protection Councils at the Centre** as well as in each State and District to promote consumer awareness.
- The Central Council is headed by **the Minister in charge of the Department of Consumer Affairs in the Central Government,** and the State Councils by the Minister in charge of Consumer Affairs in the State Governments.
- It also provides for **a 3-tier structure** of the National Commission, the State Commissions and the District Commissions for speedy resolution of consumer disputes.
- Its head office is in New Delhi.

Central Consumer Protection Authority

- It is a regulatory body established in 2020 based on the provisions of the Consumer Protection Act, 2019.
- **Nodal Ministry:** The Ministry of Consumer Affairs.
- **Composition**
- It will have a **Chief Commissioner as head** and only two other commissioners as members, one of whom will deal with matters relating to goods while the other will look into cases relating to services.
- The CCPA will have an Investigation Wing that will be headed by a Director General.
- District Collectors, too, will have the power to investigate complaints of violations of consumer rights, unfair trade practices, and false or misleading advertisements.

Tele-Law 2.0 launched: Leap in citizen-centric legal services

Tele-Law 2.0

- This version entails the fusion of **Tele-Law Services with Nyaya Bandhu pro bono legal services,** a merger to further enhance citizen accessibility to legal aid.
- The integration of **legal guidance, support, and representation through** a single registration process stands as a testament to the commitment to nurture a digitally literate and empowered populace.

Tele-Law programme

- This was launched by the Department of Justice, Ministry of Law and Justice in 2017.
- This is operating under **the DISHA Scheme.**
- The programme connects needy and marginalised people in need of legal aid with the Panel Lawyers via video conferencing/telephonic facilities available at Common Service Centres (CSCs) situated at the panchayat level.
- In addition, the service can also be accessed through the Tele-Law Mobile App.
- **Eligibility:** Legal advice is made available to everyone under the Tele-Law service. Advice is free of Cost to those who are eligible for free legal aid under Section 12 of the LSA Act, 1987.
- **Legal matters in which advice can be taken through Tele-Law service include:**
    - Dowry, family dispute, divorce, protection from domestic violence
    - Sexual harassment, sexual abuse, eve teasing at the workplace
    - Maintenance of women, children and senior citizens
    - Rights regarding property and land
    - Equal wages for males and females
    - Maternity benefits and prevention of foeticide

Gandhinagar: Union Home Minister Amit Shah chairs the 26th meeting of the Western Zonal Council

Zonal Councils

- The idea of the creation of Zonal Councils was mooted by the first Prime Minister of India, **Pandit Jawahar Lal Nehru, in 1956.**
- In the light of the vision of Pandit Nehru, five Zonal Councils were set up vide Part-III of the **States Re-organisation Act, 1956.** Hence, they are statutory bodies.
- The act divided the country into five zones **(Northern, Central, Eastern, Western and Southern)** and provided a zonal council for each zone.
- The Zonal Councils provide an excellent forum where irritants between the Centre and States and amongst States can be resolved through free and frank discussions and consultations.
- **The main objectives of setting up Zonal Councils are to-**
    - Bring out national integration;
    - Arrest the growth of acute State consciousness, regionalism, linguism and particularistic tendencies;
    - Enable the Centre and the States to cooperate and exchange ideas and experiences;
    - Establish a climate of cooperation amongst the States for successful and speedy execution of development projects.
- Each Zonal Council is an **advisory body** and may discuss any matter in

which some or all of the States represented in that Council, or the Union and one or more of the States represented in that Council, have a common interest and advise the Central Government and the Government of each State concerned as to the action to be taken on any such matter.

- In particular, a Zonal Council may discuss and make **recommendations with regard to:**
    - any matter of common interest in the field of economic and social planning;
    - any matter concerning border disputes, linguistic minorities or inter-state transport;
    - any matter connected with or arising out of the reorganisation of the States under the States Reorganization Act;
- **Organisational Structure:**
    - **Chairman:** The Union Home Minister is the Chairman of each of these Councils.
    - **Vice Chairman:** The Chief Ministers of the States included in each zone act as Vice-Chairman of the Zonal Council for that zone by rotation, each holding office for a period of one year at a time.
    - **Members:** Chief Minister and two other Ministers as nominated by the Governor from each of the States and two members from Union Territories included in the zone.
    - **Advisers:** One person nominated by the Planning Commission for each of the Zonal Councils, Chief Secretaries and another officer/Development Commissioner nominated by each of the States included in the Zone.
    - The Chief Secretaries of the States represented in such Zonal Councils act as the Secretary of the respective Council by rotation, holding office for a period of one year at a time.
    - The Joint Secretary of Zonal Councils is a Director Level officer from All India Services or Central Secretariat Services.
- **North Eastern Council:**
    - **The North Eastern State**s,e. (i) Assam, (ii) Arunachal Pradesh, (iii) Manipur, (iv) Tripura, (v) Mizoram, (vi) Meghalaya, and (vii) Nagaland, are not included in the Zonal Councils and their special problems are looked after by the North Eastern Council, set up under the **North Eastern Council Act, 1972.**
    - The North Eastern Council (Amendment) Act of 2002 also added the state of **Sikkim** to the North Eastern Council.

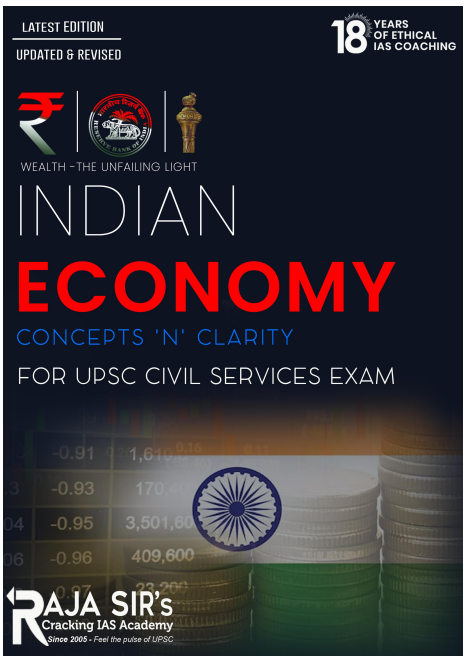
NFRA to list out frequent lapses to alert auditors, managements

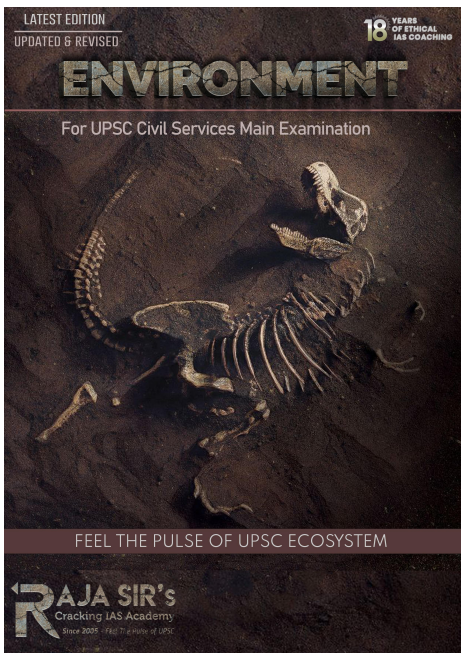
National Financial Reporting Authority (NFRA)

- The NFRA was constituted on 01st October 2018 by the Government of India under the **Companies Act, 2013.**
- It is an independent regulator to oversee the auditing profession and

accounting standards in India.

- **Objective:** To continuously improve the quality of all corporate financial reporting in India.
- **Functions and Duties:**
    - Recommend **accounting and auditing** policies and standards to be adopted by companies for approval by the Central Government;
    - **Monitor and enforce** compliance with accounting standards and auditing standards;
    - **Oversee the quality of service** of the professions associated with ensuring compliance with such standards and suggest measures for improvement in the quality of service;
- **Composition:** It consists of a chairperson, who shall be a person of eminence and having expertise in accountancy, auditing, finance, or law to be appointed by the Central Government and such other members not exceeding fifteen consisting of part-time and full-time members.
- **Powers:**
    - NFRA have the power to investigate, either suo moto or on a reference made to it by the Central Government into the matters of professional or other misconduct committed by any member or firm of chartered accountants registered under the Chartered Accountants Act, 1949.
    - It has the same powers as are vested in a civil court under the C**ode of Civil Procedure, 1908,** while trying a suit.
- **HQ: New Delhi**





ECONOMY

NHAI fund raisings to target retail investors

Infrastructure investment trust (InvIT)

- It is Collective Investment Scheme similar to a mutual fund, which enables direct investment of money from individual and institutional **investors in infrastructure projects**
- These are like mutual funds in structure which can be established as a trust and registered with Sebi.
- An InvIT **has 4 parties namely;** Trustee, Sponsor(s) and Investment Manager and Project Manager.
- While the trustee (certified by Sebi) has the responsibility of inspecting the performance of an InvIT, sponsor(s) are promoters of the company that set up the InvIT.

NHAI InvIT

- It is the infrastructure investment trust **sponsored by the National Highways Authority of India (NHAI)** to support the government's National Monetisation Pipeline (NMP).
- It is a Trust established by NHAI **under the Indian Trusts Act, 1882** and SEBI (Security and Exchange Board of India) regulations.

National Highways Authority of India

- It was constituted by an Act of Parliament in 1988 under the administrative control of **the Ministry of Road Transport and Highways.**
- It has been set up as a Central Authority to develop, maintain and manage the National Highways entrusted to it by the Government of India.
- The Authority **consists of a full-time Chairman** and not more than **five full-time Members** and four part-time Members who are appointed by the Central Government.

Fitch downgrades US rating: How will this impact India and other markets?

Credit rating

- Credit rating is an **assessment of the creditworthiness of a borrower,** including an individual, a company, or a country.

Sovereign Credit Rating

- It is an independent **assessment of the creditworthiness of a country** or sovereign entity.

- **Governments borrow** huge funds by issuing debt instruments like government bonds. **Creditworthiness here means the ability of the government to pay back its debt** without default.
- Sovereign credit ratings can **give investors insights into the level of risk** associated **with investing in the debt instruments (like bonds) of a given country**, including political risks.
- **Standard & Poor's**, **Moody's, and Fitch Ratings** are the three most **influential credit rating agencies.**
- When evaluating the creditworthiness of a country, credit **rating agencies consider various economic and financial indicators of the country**, including its **economic growth, fiscal policies**, **public debt levels**, **political stability**, and external trade position, **to assign an appropriate credit rating.**
- **Why is it important?**
    - Obtaining a good credit rating is **important for a country** that wants **to access funding** for development projects **in the international bond market**.
    - Countries with a good credit rating **can attract more foreign direct investment.**
    - It **influences the country's borrowing costs** in global financial markets. **Governments with higher credit ratings can borrow at lower interest rates**, which can save significant amounts of money in interest payments.

Adopt WHO-standard good manufacturing practices

GMP

- Good manufacturing practice (GMP) is a system for **ensuring that products are consistently produced and controlled** according to quality standards.
- It is designed to **minimize the risks involved** in any pharmaceutical production that cannot be eliminated through testing the final product.
- It covers all aspects of production; from the starting materials, premises and equipment to the training and personal hygiene of staff.
- The GMP system was **first incorporated in India in 1988** in **Schedule M** of the Drugs and Cosmetics Rules, 1945, and the last amendment was done in June 2005. WHO-GMP standards are now part of the revised Schedule M.
- There are around 10,500 manufacturing units in India out of which around 8,500 falls under Micro, Small and Medium Enterprises (MSME) category.
- The country has about 2,000 units in MSME category in the country having WHO-GMP certification.

New regulations

- Companies with a turnover of **over Rs 250 crore** will have to implement the revised GMP within six months,
- Medium and small-scale enterprises with turnover **of less than Rs 250 crore**

will have to **implement it within a year**

NCDC tasked to form 1100 new FPOs under Sahakar 22

Sahakar 22

- This initiative of NCDC included the following:
  - **FOCUS 222** – NCDC's focused assistance for Cooperatives in 222 Districts (including 117 Aspirational Districts identified by NITI Aayog);
  - **PACS HUB –** Transformation of PACS and other Coops as Apna Kisan Resource Centres;
  - **AENEC -** Act East and North East Cooperatives;
  - **CEMtC** Centres of Excellence to Market through Cooperatives;
  - **SAHAKAR PRAGYA** - Capacity Development through Laxmanrao Inamdar National Academy for Cooperative Research Development (LINAC).

NCDC

- The National Cooperative Development Corporation (NCDC) was established by **an Act of Parliament in 1963 as a statutory Corporation.**
- **Nodal Ministry:** The Ministry of Cooperation.
- **Functions**
  - **Planning, promoting and financing programmes for production**, processing, marketing, storage, export and import of agricultural produce, food stuffs, certain other notified commodities e.g., fertilisers, insecticides, agricultural machinery, lac, soap, kerosene oil, textile, rubber etc.,
  - Supply of consumer goods and collection, processing, marketing, storage and export of minor forest produce through cooperatives, besides income generating stream of activities such as poultry, dairy, fishery, sericulture, handloom etc.

REC doubles Market Cap in one year, figures in MSCI Global

MSCI Index

- It is owned by the **multinational investment management** and financial services company Morgan Stanley.
- It is an investment research firm that **provides stock indexes, portfolio risk and performance analytics, and governance** tools to institutional investors and hedge funds.
- It is a leading provider of **critical decision support tools, including stock**

indexes, and services for the global investment community.

- MSCI indices facilitate the construction and monitoring of portfolios in a cohesive and complete manner, avoiding benchmark misfit**. It has over 160,000 indices in its portfolio.**
- MSCI has indexes for countries, regions, emerging markets, developed markets, small cap, all cap and even Islamic indexes.
- It **selects stocks for its equity indexes that are easily traded and have high liquidity**, with companies having high free float getting more weightage.
- It prefers stocks that have active investor participation, and are without owner restrictions.

MSCI India Index

- The MSCI India Index is designed to measure **the performance of the large and mid-cap segments of the Indian market.**
- With 113 constituents, the index covers approximately 85% of the Indian equity universe.
- The index is **reviewed quarterly.**

Factory output growth dips to 3-month low of 3.7% in June

Index of Industrial Production

- It is one of the **Prime indicators of economic development** for the measurement of trends in the behavior of **Industrial Production over a period of time with reference to a chosen base year.**
- It indicates the **relative change of physical production in the field of industries during a specified year as compared to the previous year.**
- It is computed and published by the **National Statistical Office (NSO)** on a monthly basis.
- Base Year:
    - The base is **always given a value of 100.**
    - The **current base year for the IIP series in India is 2011-12.**
    - So, if the current **IIP reads as 116,** it **means** that there has been **16% growth compared to the base year.**

Index of Eight Core Industries (ICI):

- ICI **measures the collective and individual performance of production in selected eight core industries Coal, Crude Oil, Natural Gas, Petroleum Refinery Products, Fertilizers, Steel, Cement and Electricity.**
- The objective of the ICI is to **provide an advance indication of production performance** of industries of 'core' nature **before the release of IIP** by the Central Statistics Office.
- These **industries are likely to impact general economic activities** as well as industrial activities.
- The Index is **compiled and released by the Office of the Economic Adviser**

(OEA), Department for Promotion of Industry and Internal Trade (DPIIT), **Ministry of Commerce & Industry**, Government of India.

IEPFA launches Investor Awareness Vans titled Niveshak Sarathi

Investor Education and Protection Fund Authority (IEPFA)

- It was established in 2016 under **the Companies Act, of 2013.**
- The Authority is entrusted with
    - The responsibility of administration of the Investor Education Protection Fund (IEPF).
    - Make refunds of shares, unclaimed dividends, matured deposits/debentures etc. to investors and promote awareness among investors.
- **Nodal Ministry**: Ministry of Corporate Affairs

Investor Education Protection Fund (IEPF).

- It has been established under Section 205C of the Companies Act, 1956 by way of the **Companies (Amendment) Act, 1999.**
- The following amounts that remained unpaid and unclaimed for a period of seven years from the date they became due for payment are credited to the Fund:
    - Amounts in the **unpaid dividend accounts of the companies**
    - The application money received by companies for allotment of any securities and due for refund
    - **Matured deposits with companies**
    - Matured debentures with companies
    - Grants and donations are given to the fund by the Central Government, State Governments, companies or any other institutions for the purposes of the Fund
    - The interest or other income received out of the investments made from the fund

RBI asks banks to set aside incremental CRR

Cash Reserve Ratio (CRR)

- Cash Reserve Ratio (CRR) is the **share of a bank's total deposit** that is mandated by the Reserve Bank of India (RBI) **to be maintained with the latter as reserves in the form of liquid cash.**
- The bank **cannot use this amount for lending and investment purposes and does not get any interest from the RBI.**
- CRR **applies to scheduled commercial banks**, while the **regional rural banks and NBFCs are excluded.**

- **Key objectives of the Cash Reserve Ratio:**
  - CRR helps **control inflation. In a high-inflation environment, RBI can increase CRR** to prevent banks from lending more.
  - CRR **also ensures banks have a minimum amount of funds** readily **available to customers even during huge demand.**
  - CRR **serves as the reference rate for loans**. Also **known as the base rate for loans, the banks cannot offer loans below this rate.**
  - Since CRR regulates the money supply, it **boosts the economy whenever required by lowering the CRR.**
- **How is CRR Calculated?**
  - CRR is calculated as a **percentage of Net Demand and Time Liabilities (NDTL).**
  - This percentage is **fixed by the RBI** and is changed from time to time by the central bank itself.
  - **NDTL** for banking **refers to the aggregate savings account, current account and fixed deposit balances held by a bank.**
  - **Currently, the CRR is fixed at 4.50%.** This means that for every Rs 100 worth of deposits, the bank has to keep Rs 4.5 with the RBI.

Statutory Liquidity Ratio (SLR)

- SLR is a **minimum percentage of deposits** that a commercial bank **has to maintain in the form of liquid cash, gold or other securities.**
- It is basically the **reserve requirement that banks are expected to keep before offering credit t**o customers.
- However, these **deposits are maintained by the banks themselves and not with the RBI**.
- The SLR is **fixed by the RBI.**
- **How does SLR work?**
  - Every **bank must have a particular portion of their NDTL in the form of cash, gold, or other liquid assets** by the end of the day.
  - The **ratio of these liquid assets to the demand and time liabilities is called** the SLR.
- **Importance of SLR:**
  - The government **uses the SLR to regulate inflation and liquidity**.
  - **Increasing the SLR will control inflation** in the economy while decreasing it will cause growth in the economy.
  - Although, the SLR is a monetary policy instrument of RBI, **it is important for the government to make its debt management programme successful.**
  - SLR has **helped the government to sell its securities or debt instruments to banks.**
  - Most of the **banks will be keeping their SLR in the form of government securities as it will earn them an interest income.**

Parliamentary panel recommends relaxation in criteria for recognised startups

to avail tax benefits

Employee Stock Option Plan (ESOP)

- Employee Stock Option Plan - which is **also called Employee Stock Ownership Plan** in India is a **benefit plan** that **offers employees the right to buy company shares at a predetermined price.**
- **Purpose**:
    - It's a tool companies use to **attract, retain, and reward employees**.
    - ESOPs help to **align employees' interests with the company's growth** and success.
- **Granting of Options:**
    - Under an ESOP, eligible **employees are granted the right, but not the obligation**, **to purchase company shares at a predetermined price**, known as the "**exercise price" or "strike price."**
    - This price is **typically set at a discount to the current market price** of the company's shares.
    - Employees **have to wait for a certain time period – known as the vesting period– before they can exercise the right** to purchase those specified number of shares.
- **All companies other than listed companies** should **issue it in accordance with the provisions of the Companies Act, 2013 a**nd Companies (Share Capital and Debentures) Rules, 2014.
- **In the case of listed companies**, they should **issue in accordance with the Securities and Exchange Board of India Employee Stock Option Scheme Guidelines**.
- **To Whom Can The ESOP Be Issued? Rule 12(1) of Companies (Share Capital and Debentures) Rules, 2014** states that ESOP can be issued to the following employees-
    - **A permanent employee** of the company who is **working in India or outside India**.
    - **A Director of the company**, including a whole-time or part-time director but not an independent director.
    - **A permanent employee or director of a subsidiary company in India or outside India**, or holding company, or an associate company.
- **A company cannot issue ESOP to the following employees-**
    - An **employee who belongs to the promoter group** or **is a promoter of the company.**
    - **A director who either himself or through any body corporate** or through his relative **holds more than ten per cent of the outstanding equity shares** of the company, whether **directly or indirectly.**
    - However, the **above two conditions do not apply to Startup Companies for a period of ten years from the date of its incorporation**.

Investors from Mauritius, Singapore, Cyprus under Taxman's lens for CCD gains

Compulsorily Convertible Debentures

- It is a **type of bond** which must be **converted into stock by a specified date.**
- It is classified as a hybrid security, as it is neither purely a bond nor purely a stock.
- A debenture comes in two forms
    - **Non-convertible debenture:** It **cannot be converted into equity shares of the issuing company.** Instead, debenture holders receive periodic interest payments and get back their principal at the maturity date, just like most bondholders.
    - The interest rate attached to them is higher than for convertible debentures.
    - **Convertible debentures: May be converted into the company's equity after** a set period of time. That convertibility is a perceived advantage, so investors are willing to accept a lower interest rate for purchasing convertible debentures.

Debenture

- A debenture **is a medium- to long-term debt security issued by a company** as a means of borrowing money at a fixed interest rate.
- Unlike most investment-grade corporate bonds, **it is not secured by collateral**.
- It is backed only by the full faith and credit of the issuing company.

41 MSMEs, 20 startups supported under Technology Development Fund scheme

Technology Development Fund (TDF) Scheme

- TDF Scheme has been established to **promote self-reliance in defense technology** as a part of the **'Make in India' initiative.**
- It is a **programme of MoD** (Ministry of Defence) **executed by the Defence Research and Development Organisation (DRDO)** meeting the requirements of Tri-Services, Defence Production and DRDO.
- The scheme **encourages participation of public/private industries especially MSMEs** to create an ecosystem for **enhancing cutting edge technology capability for defence application.**
- It **supports indigenous development of components, products, systems and technologies by MSMEs** and start-ups.
- **Eligibility**:
    - **MSMEs and Startups registered in India.**

  - **Public limited company**, **private limited company, partnership firms**, limited liability partnership, one-person company, sole proprietorship **registered as per applicable Indian laws.**
  - The industry has **to be owned and controlled by an Indian** citizen.
  - Industries with **foreign investments of 49% or less.**
- **Funding Support:**
  - The funding will be **through provision of grants to the Industry.**
  - The **project cost of up to INR 10 Cr will be considered** for funding, **subject to a maximum of 90% of the total project cost.**
  - **Industry may work in collaboration with academia** or research institutions.
  - The work **involvement of academia cannot exceed 40%** of the total project cost.
  - The **funding will be linked to mutually agreed milestones.**
  - **Funds will be released either in advance against a bank guarantee** of the same amount as collateral, **or reimbursement based on the completion of milestones**.
  - Subsequent installments will be released on successful completion of milestones.
- **Project Duration: Maximum development period will be two years.**

RBI launches UDGAM, a centralised web portal for searching unclaimed deposits across multiple banks

UDGAM Portal

- It has been **developed by RBI for use by members of public** to facilitate and make it easier for them **to search their unclaimed deposits across multiple banks at one place**.
- **Reserve Bank Information Technology Pvt Ltd (ReBIT**), **Indian Financial Technology & Allied Services (IFTAS),** and **participating banks have collaborated on developing** the portal.
- The portal will **enable users to either claim the deposit amount or make their deposit accounts operative** at their respective banks.
- **Procedure**:
  - Customers can **register on the 'Udgam' platform using their mobile number**.
  - Once registered, **they can search for unclaimed deposits under their name** and provide additional inputs such as PAN, voter ID, driving licence and passport number.
  - Customers can **then retrieve their deposits by completing a KYC process** with their branch.
  - **In case the deposit-holder has passed away, their nominee will be required to submit documents.**

Unclaimed Deposits

- According to RBI, "Unclaimed Deposits" **refers to funds held in savings or current accounts that have remained inactive for duration of 10 years**, or in the case of **fixed deposits (FDs), have not been withdrawn within 10 years from the maturity date.**

2.2 mn new workers including 71 transgenders enrolled under ESIC in June

Employees State Insurance (ESI) Scheme

- It is a **social security scheme offered** by the Government of India **as per the Employees' State Insurance Act, 1948.**
- It is **administered by a statutory corporate body** called the **Employees' State Insurance Corporation (ESIC)**
- The scheme **provides protection to employees against disablement/death due to employment injury, sickness, and maternity.**
- **Applicability**:
    - The ESI Scheme **applies to factories and other establishment's** Road Transport, Hotels, Restaurants, Cinemas, Newspaper, Shops, and Educational/Medical Institutions **wherein 10 or more persons are employed.**
    - However, in **some States threshold limit** for coverage of establishments **is still 20.**
    - It is the **employer's legal responsibility to register their factory**/ establishment under the ESI Act **within 15 days of its applicability to them.**
- **Wage Limit**:
    - The existing **wage limit for coverage under the Act is Rs.21,000/- per month** (**25000/- per month in the case of Persons with Disability**).
    - It is the **employer's responsibility to enroll eligible employees** in the ESI program.
- **How are contributions made?**
    - This is a **self-financing scheme**, where the **employees and the employers make regular monthly contributions** to the scheme **at a certain percentage of their wages.**
    - As of now, **covered employees contribute 0.75% of the wages**, whereas the **employers contribute 3.25% of the wages**, **payable to their employees**.
    - **Employees earning less than Rs. 137/-** a day as daily wages **are exempted** from payment of their share of contribution.
    - The **State Governments**, as per provisions of the Act, **contribute 1/8th of the expenditure of medical benefits** within a per capita ceiling of Rs. 1500/- per Insured Person per annum.
- **The main benefits provided under ESI Scheme are:**
    - **Sickness Benefit: During medical leave**, the scheme offers cash flow during the said period. The **worker can avail 70% of the daily wage**

for a maximum of 91 days. This can be **availed in two consecutive periods**.
    - **Disablement Benefit**: In case of **temporary disablement** of the worker, they are **eligible for a monthly wage of 90% until they recover**. In the **case of permanent disability**, **90% of the monthly wage can be availed for the entire life**.
    - **Dependants' Benefit**: Paid at the rate of **90% of wage in the form of monthly payment to the dependants of a deceased Insured person** in cases where death occurs due to employment injury or occupational hazards.
    - **Maternity Benefit:** The beneficiary can a**vail 100% of the daily wages for up to 26 weeks,** which can be **extended to a further one month** based on the medical advice. **In the case of miscarriage, the benefit is 6 weeks**, while in the **case of adoption it is 12 weeks.**
    - **Medical Benefit**: Under the scheme, the i**nsured's medical expenses are covered through affordable and reasonable healthcare facilities.**
    - Besides the above, **other benefits** being provided to the beneficiaries **are Confinement Expenses, Funeral Expenses, Vocational Rehabilitation**, Physical Rehabilitation, Unemployment Allowance (RGSKY) and Skill Upgradation Training.
- **Employee's insurance number remains the sam**e as long as he or she remains within the ESIC wage limit. **Changing jobs will not affect an employee's insurance status**, and his or her **insurance number will remain the same**.

Digital India expansion gets ₹14903 crore outlay

National Supercomputing Mission

- It was **launched in 2015** to **provide the country with supercomputing infrastructure** to **meet the increasing computational demands of academia, researchers**, MSMEs, and startups.
- The Mission is **steered jointly by the Department of Science and Technology (DST)** and **Ministry of Electronics and IT (MeitY)** and **implemented by the Centre for Development of Advanced Computing (C-DAC), Pune and the Indian Institute of Science (IISc), Bengaluru.**
- The **main objectives** of the mission are:
    - **Make India a world leader in High-Performance Computing (HPC)** and **enhance the national capability in solving** grand challenge **problems of national and global relevance.**
    - **Empower scientists & researchers with state-of-the-art computing facilities for** their **cutting-edge research** in their respective Domains.
    - **Reduce redundancies and avoid duplication of efforts** and investments.
    - Create an ecosystem for positioning India as a major power for

supercomputing and **attain global competitiveness and self-reliance in HPC**.

- The **Mission envisages empowering academic and R&D institutions** spread over the country **by installing a vast supercomputing grid comprising of more than 70 HPC facilities.**
- These supercomputers **will also be networked on the National Supercomputing grid** **over the National Knowledge Network (NKN).**The NKN is another programme of the government which connects academic institutions and R&D labs over a high speed network.
- **Academic and R&D institutions,** as well as key user departments/ministries, **would participate by using these facilities and developing applications of national relevance**.
- The Mission **also includes the development of highly professional and skilled human resources for meeting the challenges of development of these applications.**

Indian supercomputers in the Top 500 Global Supercomputing List:

- The **AI Supercomputer 'AIRAWAT'**, installed at **C-DAC, Pune,** has been ranked at **75.**
- **PARAM Siddhi-AI supercomputer** installed at **C-DAC, Pune,** has been ranked at **131.**
- **Pratyush supercomputer** installed at the **Indian Institute of Tropical Meteorology** has been ranked at **169.**
- **Mihir supercomputer** installed at the **National Centre for Medium Range Weather Forecasting** has been ranked **at No. 316.**

Check RBI's Circular On Reset Of Floating Interest Rate On EMI-Based Personal Loans

Floating Interest Rate:

- A floating interest rate is an **interest rate that changes periodically**.
- The rate of interest **moves up and down, or "floats**," reflecting economic or **financial market conditions.**
- A floating interest rate can **also be referred to as an adjustable or variable interest rate** because it can vary over the term of a debt obligation.
- The **change in interest rate** with a floating rate loan **is typically based on a reference, or "benchmark", rate** that is **outside of any control by the parties** involved in the contract.
- The **reference rate is usually a recognized benchmark interest rate**, **such as the prime rate,** which is the **lowest rate that commercial banks charge their most creditworthy customers for loans** (typically, large corporations or high net worth individuals).
- **How is floating interest rate calculated?**
    - A floating interest rate **uses a reference rate as the base.**
    - In order to arrive at the floating rate, **a spread (or margin) is added to**

the reference rate.
    - **Floating Interest Rate = Base Rate + Spread**
    - Floating interest rates can be **modified quarterly, half-yearly or annually.**
- **Several factors tend to influence the calculation of floating interest rates**. Some of the economic factors are,
    - **Repo rate**
    - **Government's monetary policies**
    - **Inflation rate**
    - **Fiscal deficit**
    - **Global and foreign interest**
- **When is Floating Rate Relevant?**
    - **While applying for a loan:**
        - Typically, intending **borrowers pick a loan with a floating rate when they expect a reduction in the interest rate** or a dynamic rate through their loan tenure.
        - Additionally, such an interest type **enables individuals to make prepayments easily and pay off their debt faster and at a much lower interest burden.**
    - **While investing:**
        - **Individuals can choose** investment instruments with **floating rates when they anticipate the base rate will be the same, or an expected change will be in their favour.**
        - **Under such situations, the interest earned on investments** made either **stays the same or is likely to increase.**
- **Limitations of Floating Rate:**
    - The fluctuation of **rate is beyond the control of both parties in a contract**, namely – the lender and borrower in a lending institution setup.
    - Similarly, **investors and investment firms have to make their way around the fluctuations to generate earnings** while cushioning their capital.
    - Even the **slightest increase in the interest rate can push loan EMI burden significantly** for loan borrowers. It often makes the repayment process challenging and **disrupts a functioning financial plan.**
    - A **small decrease in the interest rate generates a return on investment which is much lower** than what one had anticipated before. As a result, **investors may take a longer time to reach their respective financial goals**.
    - **Both borrowers and investors often find it quite challenging to manage their budget plan and regulate savings** when dealing with a floating rate based financial or investment option.

Bhu-Vision: IoT-based automated soil testing & advisory platform

Bhu-Vision

- It is also known as KRISHI-RASTAA **Soil Testing System.**
- It has been jointly developed by **ICAR-IIRR(Indian Council of Agricultural Research -Indian Institute of Rice Research) and KrishiTantra.**
- This system seamlessly **conducts 12 key soil parameter tests in just 30 minutes**.
- It provides quick and accurate results directly to farmers and stakeholders through a soil health card on their mobile devices.

Indian Institute of Rice Research

- It was established as All India Coordinated Rice Improvement Project (AICRIP) by the Indian Council of Agricultural Research (ICAR) in 1965.
- Headquarter: Hyderabad.
- **Mandate**
- Basic and strategic research for enhancing rice productivity under irrigated ecosystem
- Coordination of multi-location testing to develop location specific varieties and technologies for various ecosystems.
- Dissemination of technologies, capacity building and establishing linkages

Govt likely to consider MEP for exports of specialty rice

Minimum Export Price

- It is the **price below which an exporter** is **not allowed to export** the commodity from India.
- It is imposed in view of the rising domestic retail/wholesale price or production disruptions in the country.
- It is a kind of **quantitative restriction to trade.**
- The government fixes MEP for the **selected commodities to arrest domestic price rises** and augment domestic supply.
- This is intended to be imposed **for short durations** and is removed when situations change.
- The removal of MEP helps farmers/exporters realise better and remunerative prices.
- MEP was first implemented on basmati rice in FY11 to deter exports and is typically implemented to contain surging domestic prices because of production disruptions.
- **Legal backing**
    - As per section 5 of **the Foreign Trade (Development And Regulation) Act, 1992,** the Central Government may, from time to time, formulate and announce, by notification in the Official Gazette, the export and

import policy and may also, in the like manner, amend that policy.

SEBI mulls higher NRI investment for FPIs in IFSC

Foreign Portfolio Investment (FPI)

- FPI **refers to the purchase and holding** of a wide array of **foreign financial assets by investors seeking to invest in a country outside their own.**
- Foreign portfolio investors **have access to a range of investment instruments such as stocks, bonds, mutual funds, derivatives, fixed deposits**, etc.
- FPI **generally intends to invest money** i**nto the foreign country's stock market to generate a quick return.**
- **Who regulates FPI in India?**
    - In India, foreign portfolio investment is **regulated by the Securities and Exchange Board of India (SEBI).**
    - FPI in India r**efers to investment groups or FIIs** (foreign institutional investors) **and QFIs** (qualified foreign investors).
- **Advantages**:
    - It offers investors the **freedom to diversify their portfolios internationally.**
    - A portfolio investor c**an also take advantage of exchange rate differences.** Thus, an investor from an economically challenged country can invest heavily in a foreign country that has a much stronger currency, thereby making sizeable profits.

Foreign Direct Investment (FDI)

- It is a category of cross-border investment in which an **investor resident in one economy establishes a lasting interest in and a significant degree of influence over an enterprise resident in another economy.**
- **It is an ownership stake in a foreign company or project** made by an investor, company, or government **from another country.**
- FDI is a key element in international economic integration because **it creates stable and long-lasting links between economies.**

FPI vs. FDI:

- **FDI seeks an ownership stake in a foreign company** or project made by an investor, company, or government from another country.
- **FPI is a form of investment in the assets of a foreign enterprise,** such as stocks or bonds. It **does not offer any form of control over the entity** and hence offers **no ownership of the entity.**
- **Unlike FDIs, an FPI does not require any transfer of IP, technology, or know-how. T**here is no need to enter a joint venture with a partner company.
- **FDI comprise significantly larger sums,** and any tie-ups or operations **tend to last longer than portfolio investments.**

- **Portfolio investments typically have a shorter time frame for investment return** than direct investments.
- **FDIs are usually the domain of major players in the industry,** venture capital ecosystems, and investment branches of globally recognised financial institutions. **Most Financial Portfolio Investment examples include smaller players** who invest in a foreign country's assets and securities for short-term profits.

Focus on digital capability upgrade, FM Sitharaman tells rural banks

Union Finance Minister Nirmala Sitharaman on Wednesday emphasised regional rural banks (RRBs) to upgrade their digital capability and increase penetration under Pradhan Mantri Mudra Yojana. A senior finance ministry official said that all sponsor banks have initiated steps for the introduction of customer-oriented banking services in RRBs.

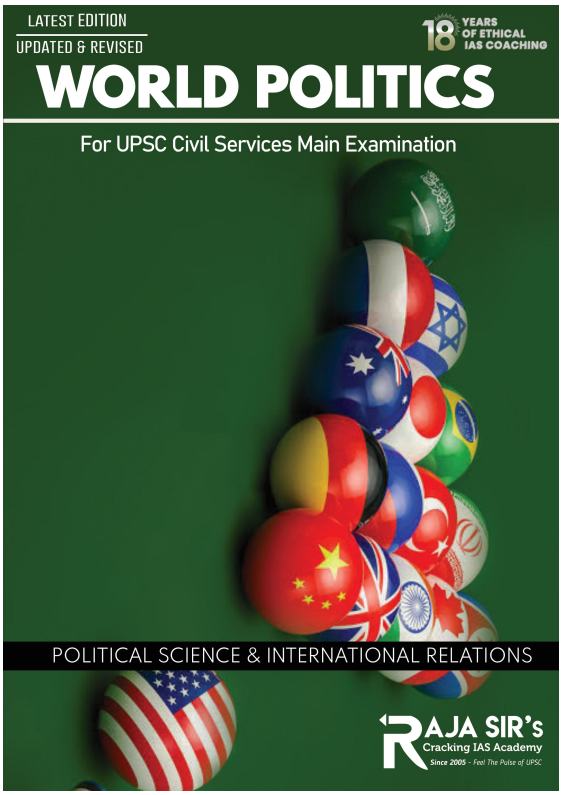
Regional Rural Banks (RRBs)

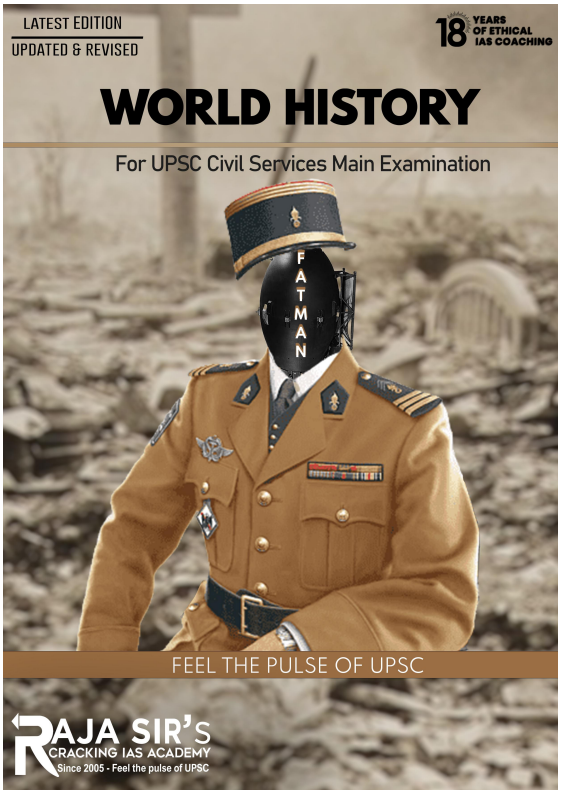
- RRBs are **government-owned scheduled commercial banks** of India that operate at the **regional level** in different states of India.
- They serve the country's rural areas and provide them with basic banking and other financial-related services.
- **Origin:**
    - **The Narasimham Committee** on Rural Credit (1975) recommended the establishment of Regional Rural Banks (RRBs).
    - The establishment of RRBs finds its route in the ordinance passed on 26th September 1975 and the **RRB Act 1976.**
    - Prathama Grameen Bank was the first RRB bank and was established on 2nd October 1975.
- **Functions:**
    - To provide basic **banking facilities** to rural and semi-urban areas.
    - To effect some governmental functions, such as the disbursal of wages under the **MGNREGA policy.**
    - To provide other bank-related facilities such as locker facility, internet banking, mobile banking, debit and credit cards, etc.
    - **Grant credit facilities** to people in rural areas, such as small farmers, artisans, small entrepreneurs, etc.
    - To accept deposits from people.
- **Regulation**: Regional Rural Banks are regulated by RBI and supervised by the National Bank for Agriculture and Rural Development (NABARD).
- **Ownership:** RRBs are jointly owned by the Government of India (GOI), the Sponsor Bank and the concerned State Government with share proportions of 50%, 35% & 15%, respectively.
- **Management**: The Board of Directors manages these banks, overall affairs, which consists of one Chairman, three Directors as nominated by the Central Government, a maximum of two Directors as nominated by the concerned

State Government, and a maximum of three Directors as nominated by the sponsor bank.

Pradhan Mantri Mudra Yojana (PMJDY)

- It is a flagship **scheme of the Ministry of Finance, Government of India, launched on 8th April 2015.**
- It is a F**inancial Inclusion (FI) programme in the country** based on three pillars - Banking the Unbanked, Securing the Unsecured and Funding the Unfunded.
- **Types of loans:**
    - **Shishu** - Covering l**oans up to Rs 50,000;**
    - **Kishor** - Covering loans **above Rs 50,000 and up to Rs 5 lakh;**
    - **Tarun** - Covering loans **above Rs 5 lakh and up to Rs 10 lakh.**
- **Eligibility**:
    - **Any Indian Citizen with a business plan for a non-farm sector income-generating activities** such as manufacturing, processing, trading or service sector.
    - **They can avail** from all Public Sector Banks, Regional Rural Banks and Cooperative Banks, Private Sector Banks, Foreign Banks, Micro Finance Institutions (MFI) and Non-Banking Finance Companies (NBFC) **up to Rs 10 lakhs Micro Units Development & Refinance Agency Ltd. (MUDRA) loans under PMMY.**





Could China take Kuril islands claimed by Japan and Russia?

- The Kuril Islands are stretched from the **Japanese island of Hokkaido** to the southern tip of **Russia's Kamchatka Peninsula** separating the **Okhotsk Sea from the North Pacific Ocean.**
- The chain is part of the belt of **geologic instability circling the Pacific (Ring of Fire)** and contains at least 100 volcanoes, of which **35 are still active, and many hot springs.**
- **Significance:**
    - **Natural resources:** The islands are **surrounded by rich fishing grounds** and are thought to have offshore reserves of oil and gas.
    - **Strategic Importance:** Russia has **deployed missile systems in the region.** Russia also plans a submarine project and intends to prevent any American military use of the islands.
    - **Cultural Importance:** The **Japanese** people, especially conservatives in Hokkaido, are **emotionally attached to the islands.**

History of the Kuril Islands Dispute

- The Kuril Islands dispute between **Japan and Russia** is over the **sovereignty of South Kuril Islands.**
- The South Kuril Islands comprise **Etorofu island, Kunashiri island, Shikotan island and the Habomai island.**
    - These islands are **claimed by Japan but occupied by Russia** as the successor state of the Soviet Union.
- **Treaty of Shimoda (1855):**
    - In **1855**, Japan and Russia concluded the **Treaty of Shimoda**, which gave control of the four southernmost islands to Japan and the remainder of the chain to Russia.
- **Treaty of Saint Petersburg (1875):**
    - In the **Treaty of Saint Petersburg**, signed between the two countries in 1**875, Russia ceded possession of the Kurils to Japan in exchange for uncontested control of Sakhalin Island.**
    - However, these islands were again seized by the Soviet Union at the end of **World War II.**
- **Yalta Agreement (1945):**
    - In **1945**, as part of the **Yalta agreements (formalized in the 1951 Treaty of Peace with Japan)**, the islands were ceded to the Soviet Union, and the Japanese population was repatriated and replaced by the Soviets.
- **San Francisco Peace Treaty (1951):**
    - The **San Francisco Peace Treaty** signed between the Allies and Japan in 1951, states that Japan must give up "all right, title and claim to the Kuril Islands", **but it also does not recognize the Soviet Union's sovereignty over them.**

    - In World War II, the main combatants were:
        - **Axis powers** (Germany, Italy, and Japan)
        - **Allies** (France, Great Britain, the United States, the Soviet Union, and, to a lesser extent, China).
- **Japan-Soviet Joint Declaration (1956):**
    - The dispute over the islands has **prevented the conclusion of a peace treaty to end World War II.**
    - In 1956, diplomatic ties were restored between Japan and Russia by **Japan-Soviet Joint Declaration.**
    - During that time, Russia offered to give away the two islands closest to Japan. But the offer was rejected by Japan as the two islands constituted **only 7% of the land** in question.

Current Scenario

- Despite a series of agreements, the dispute continues, and **Japan still claims historical rights to the southernmost islands** and has tried repeatedly to persuade the Soviet Union and, from 1991, Russia to return those islands to Japanese sovereignty.
- In **2018,** the Russian President and the Japanese Prime Minister (PM) met on the sidelines of the **East Asia Summit** and decided to end the territorial dispute by the Japanese PM agreeing to negotiate based on the 1956 declaration.
    - This implicitly showed that Japan has given up the two islands to maintain peace with Russia.
- However, Russia indicated that the joint declaration signed by Japan and the Soviet Union in 1956 **neither mentions a basis for returning Habomai and Shikotan nor clarifies which country has sovereignty over the islands.**
- Further, in **2019**, the Japanese PM made it clear that the country is **not in the favour of withdrawing control over the Islands.**
- Japan also believes that the islands are an inherent part of the nation's territory.
- Therefore, **Japan mentioned that it aims to sign the peace treaty after the territorial issue is resolved.**

With focus on Pacific, Indian warships make port call at Papua New Guinea

Papua New Guinea

- It is an **island country** that lies in the **southwestern Pacific.**
- It **includes the eastern half of New Guinea**(the **world's second-largest island**) and **many small offshore islands**.
- **Neighbours**: **Indonesia** to the west, **Australia** to the south and **Solomon Islands** to the southeast.
- **Capital: Port Moresby**
- **Terrain**: It is **mainly mountainous** but **has low-lying plains** in southern New Guinea.

- **The islands** that constitute Papua New Guinea w**ere settled over a period of 40,000 year**s by a mixture of **peoples who are generally referred to as Melanesians.**
- **Language**:
  - **English is the main language of governmentand commerce**.
  - In **most everyday contexts,** the most widely **spoken language is Tok Pisin**.
  - **Linguistically**, it is the **world's most diverse country**, with more than **800 languages.**
- **Religion**: **The majority of** Papua New Guinea's people **are at least nominally Christian**.
- **Government**:
  - Papua New Guinea **became self-governing on 1 December 1973** and achieved **independence on 16 September 1975.**
  - The country is a **constitutional monarchy and a member of the Commonwealth.**
  - **The British monarch**, **represented by a governor-general, is the head of state**, and the **Prime Minister is the head of government**.

Russia announces sanctions on ICC prosecutor, UK ministers

International Criminal Court (ICC)

- It is the **only permanent international criminal tribunal**.
- **Background**: It was **created by the 1998 Rome Statute**of the International Criminal Court (its founding and governing document), and **began functioning on 1 July 2002** when the Statute came into force.
- **Mandate**: **It investigates**and, where warranted, **tries individuals charged with the gravest crimes of concern to the international community**: genocide, war crimes, crimes against humanity, and the crime of aggression.
- **HQ: Hague, Netherlands.**
- **Members**: **123 nationsare States Parties to the Rome Statute** and recognize the ICC's authority; the **notable exceptions being the US, China, Russia, and India.**
- **Funding**: The Court is **funded by contributions from the States Parties and by voluntary contributions** from Governments, international organizations, individuals, corporations, and other entities.
- **Composition**:
  - **Judges**: The Court has **eighteen judges**, each **from a different member country, elected to non-renewable nine-year** terms.
  - **The Presidency**: **Consists of three judges**(the President and two Vice-Presidents) **elected from among the judges**. It **represents the Court to the outside world** and helps with the **organization of the work of the judges**.
  - **Judicial Divisions:18 judges in 3 divisions**, the Pre-Trial Division, the Trial Division, and the Appeals Division.

- **Office of the Prosecutor (OTP):**OTP is responsible for **receiving referrals and any substantiated information on crimes** within the jurisdiction of the Court. OTP **examines these referrals and information, conducts investigations, and conducts prosecutions** before the Court.
- **Registry**: The core function of the Registry is to **provide administrative and operational support** to the Chambers and the Office of the Prosecutor.

- **Jurisdiction of ICC:**
  - Unlike the International Court of Justice, which hears disputes between states, the **ICC handles prosecutions of individuals**.
  - The ICC is **only competent to hear a case if:**
    - the **country where the offence was committed is a partyto the Rome Statute**; or
    - the **perpetrator's country of origin is a party to the Rome Statute.**
  - The ICC may **only exercise its jurisdiction if the national court is unable or unwilling to do so.**
  - The ICC **only has jurisdiction over offences committed after the Statute's entry into force on 1 July 2002.**
- **Relation with UN:**
  - While not a United Nations organization, the Court **has a cooperation agreement with the United Nations.**
  - When a situation is not within the Court's jurisdiction, **the United Nations Security Council can refer the situation to the ICC, granting it jurisdiction**.

G20 health ministers prioritise, commit to tackling AMR with One Health approach

The two-day G20 health ministers meeting concluded in Gandhinagar, Gujarat on August 19, 2023. The ministers met in order to discuss major issues and challenges pertaining to global health.

Antimicrobial resistance (AMR) was part of one of the three key health-related priority areas of the meeting set under India's G20 presidency.

Antimicrobial Resistance

- **Antimicrobial Resistance** is the resistance acquired by any microorganism (bacteria, viruses, fungi, parasite, etc.) against antimicrobial drugs that are used to treat infections.
  - It **occurs when a microorganism changes over time and no longer responds to medicines** making infections harder to treat and increasing the risk of disease spread, severe illness and death.
  - The **World Health Organisation (WHO)** has identified **AMR as one of the top ten threats to global health.**

- Microorganisms that develop antimicrobial resistance are sometimes referred to as **"superbugs".**
- In India, over **56,000 newborn deaths each year due to sepsis** caused by organisms that are resistant to first line antibiotics.
- A study reported by **ICMR (Indian Council of Medical Research)** from 10 hospitals showed that **when Covid patients acquire drug-resistant infections in hospitals, the mortality is almost 50-60%.**
- The multi-drug resistance determinant, **New Delhi Metallo-beta-lactamase-1 (NDM-1)**, emerged from this region.
    - Africa, Europe and other parts of Asia have also been affected by multi-drug resistant typhoid originating from South Asia.

Concerns Regarding AMR

- **Life-threatening Condition:** The growth of AMR has proved to be a **major challenge in the treatment of sepsis,** which is a life-threatening condition and, unfortunately, the failure of antibiotics is **leading to deaths which are preventable.**
- **Reduction in Medical Advances:** AMR is also **undermining and undoing medical advances made over decades,** especially for high-burden diseases like **tuberculosis** and various cancers.
- **Achievements of Goals:** It is putting the gains of the Millennium Development Goals at risk and **endangers achievement of the Sustainable Development Goals.**
- Increase in Superbugs: Untreated wastewater from medical facilities is awash with chemical compounds that **promote superbugs.**
- **Expanding with Time:** The concoction of **self-medication and over the counter (OTC) antibiotic availability** has led to one of the **highest rates of antibiotic resistance** in the world.

Greece confers Grand Cross of the Order of Honour on PM Modi

Grand Cross of the Order of Honour

- It is the s**econd-highest civilian honour in Greece.**
- It is c**onferred to "eminent personalities who, by reason of their distinguished position, have contributed to enhancing the stature of Greece".**
- The Order of Honour was e**stablished in 1975.**
- The **head of the goddess Athena is depicted on the front side of the Star** with the **inscription "ONLY THE RIGHTEOUS SHOULD BE HONOURED".**

Greece

- **Location**: It is located in **southeastern Europe**, on the so**uthern tip of the Balkan Peninsula.**
- **Official Name: Hellenic Republic**

- **Bordering Countries:**
  - The country is bordered by **Albania, Bulgaria, Turkey, and North Macedonia.**
  - Greece shares **maritime borders with Cyprus, Egypt, Italy, and Libya.**
- **Geography**:
  - The **mainland has rugged mountains, forests, and lakes**.
  - The country is **well known for the thousands of islands** dotting the blue Aegean Sea to the east, the Mediterranean Sea to the south, and the Ionian Sea to the west.
  - The **largest Greek island is Crete**.
- **Capital: Athens**
- **History**:
  - Greece is often r**eferred to as the "cradle of Western civilisation"** because of its contributions to philosophy, democracy, and literature.
  - It was the **home of famous ancient philosophers like Socrates, Plato, and Aristotle.**
  - During **ancient times, the country was divided into city-states,** which were **ruled by noblemen.** The largest were **Athens, Sparta, Thebes, and Corinth.**
  - **Independence**: Greece **gained its independence from the Ottoman Empire i**n the **early 19th century,** following a war of independence that began in 1821.
- **Political System:**
  - It is a **parliamentary republic** with a **head of government - the prime minister** who h**as the most political power**, and the head of state - the president - whose duties are largely ceremonial.
  - The **executive power is exercised by the government.**
- **Languages**: **Spoken languages are Greek (official) and Turkish** (predominantly spoken by a minority of Turks in Western Thrace).
- **Olympics**:
  - The Olympic Games **have their origins in ancient Greece,** where the f**irst Olympic Games were held in Olympia in 776 BC**.
  - Greece also **hosted the first modern Olympic Games in Athens in 1896.**

India and Iran drop foreign arbitration clause in Chabahar port issue

- India and Iran have agreed to pursue arbitration under rules framed by the UN Commission on International Trade Law (UNCITRAL) and will not go for commercial arbitration in foreign courts.

UN Commission on International Trade Law (UNCITRAL)

- It is a subsidiary body of the UN General Assembly, established in 1966.
- **Mandate:** To further the progressive harmonisation and unification of the law

of international trade.

- **Membership:**
- The Commission is **composed of 60 member** States elected by the General Assembly.
- The 60 member States include 14 African States, 14 Asian States, 8 Eastern European States, 10 Latin American and Caribbean States and 14 Western European and other States.
- The General Assembly elects **members for terms of six years**; every three years, the terms of half of the members expire.
- **India is a founding member** of this organisation.

Chabahar Port

- It is a seaport in **the Sistan-Balochistan** province of Iran, on the Gulf of Oman, at the mouth of the Strait of Hormuz.
- It is a deep-water port with direct access to the Indian Ocean that is outside the Hormuz Strait.
- Its geographic proximity to countries such as Afghanistan, Pakistan, and India, as well as its status as a key transit centre on the burgeoning International North-South Transport Corridor.

ENVIRONMENT

Climate change is altering the colour of the oceans: What a new study says

Although the change in the colour of the oceans doesn't impact marine life directly, it indicates that marine ecosystems are in a state of flux and they could completely go out of balance in the future, which could severely affect ocean life and humans dependent on them.

The colour of the Earth's oceans has significantly altered over the past two decades, most likely due to human-induced climate change, according to a new study. Over 56 per cent of the oceans, more than the total land area on the planet, has experienced the shift in colour, it added.

What makes the oceans colourful

- In most regions across the world, the oceans appear blue or navy blue for a reason. This happens due to "the absorption and scattering of light," according to a report by NASA. When the sunlight falls on deep and clear water, colours with longer wavelengths, such as red, yellow and green, are absorbed by the water molecules but blue and violet, which have a much shorter wavelength, are reflected back.
- But when the water isn't deep or clean, an ocean can appear to be of a different colour.
- For instance, along Argentina's coastline, where major rivers merge into the Atlantic Ocean, the ocean exudes a brown tint because of dead leaves and sediments spewing from the rivers.
- In other parts of the world, the oceans appear green, which happens due to the existence of phytoplankton on the upper surface of the water.
- Phytoplankton are microscopic marine algae that contain the green-coloured pigment chlorophyll. The pigment helps them absorb sunlight, which they use to capture carbon dioxide from the atmosphere and convert it into sugars. Moreover, chlorophyll absorbs the red and blue portions of the light spectrum — or photosynthesis — and reflects green light
- So, the ocean over regions with high concentrations of phytoplankton will appear as certain shades, from blue-green to green, depending upon the type and density of the phytoplankton population there

Moderate Resolution Imaging Spectroradiometer (MODIS), aboard NASA's Aqua satellite, which has been monitoring ocean colour since 2002 — the measurements are taken in terms of the amount of light coming off the surface of the oceans, at all seven of the different wavelengths of light, from violet to red.

Then, to check if the phenomenon has occurred due to **climate change**, researchers used a climate model – a computer representation of the Earth. this model simulated the planet's oceans under two scenarios: one with the addition of greenhouse gases, and the other without it. The greenhouse-gas model predicted that a significant

trend should show up within 20 years and that this trend should cause changes to ocean colour in about 50 percent of the world's surface oceans

The study says one of the most affected areas is the Tropical ocean regions, near the equator, where the water is turning from blue to green.

The findings suggest that a shift in colour is happening in those regions where the oceans are getting more stratified.

Ocean stratification is the natural separation of an ocean's water into horizontal layers by density, with warmer, lighter, less salty, and nutrient-poor water layering on top of heavier, colder, saltier, nutrient-rich water. Usually, ocean ecosystems, currents, wind, and tides mix these layers, creating smoothed temperature and salinity transitions between them.

ISRO rocket debris on Australian shore: rules governing space junk

- A large object found on the shores of western Australia a couple of weeks ago has been confirmed to be the **debris of an Indian Space Research Organisation (ISRO) rocket.**
- An ISRO official said the object was most likely an unburnt part of the PSLV rocket that launched a navigation satellite for the IRNSS constellation two months ago.

Are such incidents normal?

In recent times, a large chunk of a 25-tonne Chinese rocket fell into the Indian Ocean in May 2021. The most famous such case remains that of the Skylab space station, a predecessor to the currently operational International Space Station, which disintegrated in 1979. Large chunks from this disintegration fell into the Indian Ocean, some of them falling on land in western Australia.

Isn't it dangerous?

The threat to life and property from falling space junk is not negligible. Even when falling into the oceans, which is more likely since 70 per cent of the earth's surface is ocean, large objects can be a threat to marine life, and a source of pollution.

What happens if these objects cause damage?

- There are international regulations governing space debris, which include junk falling back on the earth. Most space-faring countries are signatories to the Convention on **International Liability for Damage Caused by Space Objects**. This convention is one of the several international agreements that complement the Outer Space Treaty, the overarching framework guiding the behaviour of countries in space. The Liability Convention deals mainly with damage caused by space objects to other space assets, but it also applies to

damage caused by falling objects on earth.

- The Convention makes the launching country "**absolutely liable**" to pay compensation for any damage caused by its space object on the earth or to a flight in air. The country where the junk falls can stake a claim for compensation if it has been damaged by the falling object.
- In the current case, if the PSLV junk had caused any damage in Australia, India could have been liable to pay compensation, even if the object fell into the ocean and was then swept to the shores. The amount of compensation is to be decided "in accordance with international law and the principles of justice and equity".
- This provision of the Convention has resulted in compensation payment only once so far — when Canada sought damages from the then Soviet Union, for a satellite with radioactive substance that fell into an uninhabited region in its northern territory in 1978. The Soviet Union is reported to have paid 3 million Canadian dollars.

Experts say 'road transect' method is most effective for vulture population estimation in Mudumalai Tiger Reserve

- A group of researchers has ascertained that the road transect method, is the most effective method to estimate vulture populations in the Mudumalai Tiger Reserve (MTR), home to the southernmost, viable populations of at least three species of endangered vultures in India.
- Road transects are a sampling methodology between two points along which a survey is undertaken to identify the species and number of individual animals seen along the line. If suitably planned, road transects can cover large areas with little chance of individuals being double-counted by volunteers undertaking the count.
- A comparative population estimation method was conducted due to the challenges and limitations of each of these methods, including "limited access for assessing breeding populations because they are mostly located in inhospitable and undulating terrain that is difficult to cover by **road transect method**, nest counts being only viable option for nesting populations and carcass monitoring being dependant on the wildlife kills of cattle."
- Of the three estimation methods evaluated, the researchers found that the road transect method was the most accurate method to estimate the vulture population in MTR. Road transects were successful in identifying all four species of vultures seen in the MTR —the white-rumped vulture, long-billed vulture, Asian king vulture and the Egyptian vulture. This would have been difficult otherwise, as only the nesting sites of white-rumped and long-billed vultures are accessible to researchers in MTR, while the nesting site of the Asian king vulture is yet to be identified and the Egyptian vulture is known to have stopped nesting in the Nilgiris altogether.
- As vultures in general, move in and out of a territory, the road transect method is very effective in determining population change over a time.
- It may be noted that the states of Tamil Nadu, Kerala and Karnataka recently

conducted a synchronous vulture census.

Australia's Great Barrier Reef off UNESCO Danger List, Still Under 'Serious Threat'

Great Barrier Reef

- **Location**: It lies in the **Pacific Ocean** off the **northeastern coast of** Queensland, **Australia, in the Coral Sea.**
- It is the **longest and largest coral reef system** in the world.
- **Size:**
  - It extends in roughly a **northwest-southeast direction** for more than **2,000 km,** at an offshore distance ranging from 16 to 160 km, and its **width ranges from 60 to 250 km.**
  - It has an area of some **350,000 square km**.
- It is composed of over **2,500 individual reefs** of varying sizes and shapes **and over 900 islands.**
- It was designated as a **UNESCO World Heritage Site in 1981.**
- Much of the Great Barrier Reef is a **marine protected area**, **managed by the Great Barrier Reef Marine Park Authority of Australia.**
- **Biodiversity**: It is estimated that the reef is home to around **1,500 species of fish and around 600 different coral species.**

Corals

- Corals are **marine invertebrate** animals that belong to the **phylum Cnidaria.**
- **Coral Polyps:**
  - Corals **exist as individual polyps**, which are **small, sac-like organisms** with a **mouth surrounded by tentacles.**
  - The polyps **secrete a hard external skeleton made of calcium carbonate**, which forms the **basis of the coral structure.**
- **Colony**:
  - Most **polyps live in groups** of hundreds to thousands of genetically identical polyps **that form a 'colony'.**
  - The **colony is formed by a process called budding**, which is where the **original polyp literally grows copies of itself.**
- **Symbiotic Relationship:**
  - Many corals have a **symbiotic relationship with single-celled algae called zooxanthellae.**
  - **These algae** live within the coral's tissues and **provide them with essential nutrients through photosynthesis.**
  - In return, the **corals offer protection and a place to thrive** in well-lit, shallow waters.
- **Coral Reefs**
  - Coral **polyps secrete a hard skeleton made of calcium carbonate**, which over time forms the reefs.
  - Coral reefs are therefore **created by millions of tiny polyps forming**

large carbonate structures.

- **Coral Bleaching:**
  - When **stressed by high temperatures,** pollution, or other factors, **corals expel their zooxanthellae**, leading to coral bleaching.
  - Without their symbiotic algae, **corals lose their vibrant colours** and **become more vulnerable to disease and mortality.**

Facing existential crisis, Western Tragopan sees a glimmer of hope in Himachal Pradesh for its survival

Western Tragopan

- It is also known as the **western horned tragopan**, is amongst the rarest of all living pheasants.
- Due to its beautiful plumage and large size, this bird **is locally known as 'jujurana'** or 'king of birds'.
- It is the **state bird of Himachal Pradesh**.
- **Distribution:** It is **endemic to the northwest Himalaya**, within a narrow range from Hazara in north Pakistan through Jammu and Kashmir and Himachal Pradesh, to the western part of Garhwal.
- The upper part **of Great Himalayan National Park's** (GHNP) forest zone holds the world's largest known population of western tragopan.
- It prefers a habitat of ringal (dwarf) bamboo beneath dense forest.
- **Diet:** It **feeds mostly on leaves, shoots and seeds**, but also consumes insects and other invertebrates.
- **Threats:** Habitat loss, hunting pressure and anthropogenic disturbances which includes livestock grazing, minor forest produce collection like medicinal herbs etc.
- **Conservation status**
  - **IUCN:** Vulnerable

Lok Sabha passes Bill to provide fixed 50-year production lease for offshore minerals

Offshore Areas Minerals (Development and Regulation) Amendment Bill, 2023

- The Bill **amends the Offshore Areas Mineral (Development and Regulation) Act, 2002.**
- The new bill **regulates mining in maritime zones of India**.
- **Highlights of the Bill:**
  - It **allows the government to reserve offshore areas** that are not held under any operating rights.
  - The Bill also allows the administering authority to **grant a composite licence or production lease to the government or a government company.**

- It proposes to remove the provision for renewal of production lease and **provide a fixed period of fifty years for production lease** similar to the provisions of the Mines and Minerals (Development and Regulation) Act 1957.
- It also seeks to **provide for the grant of production lease to the private sector only through auction by competitive bidding.**
- It also **provides for grant of operating rights without competitive bidding to a government** or a government company, **or a corporation in the mineral-bearing areas reserved by the central government.**
- In the case of **atomic minerals**, the grant of exploration licence or **production lease shall be made only to a government** or a government or corporation.
- It **aims to introduce a four-year timeline for commencement of production and dispatch after the execution of composite licence** or production lease under and timeline of two years (extendable by one year) for re-commencement of production and dispatch after discontinuation.
- **It will enable the central government to frame rules for the conservation and systematic development of minerals in offshore areas** and for the protection of the environment by preventing or controlling any pollution which may be caused by exploration or production operations.

Himalayan Vulture breeds in captivity at Assam State Zoo

- It is the **second instance (First was in France) in the world** and first in India where this species has been kept for breeding.
- The captive breeding was a joint project undertaken by the Bombay Natural History Society (BNHS) and the Assam forest department

Himalayan vulture

- The Himalayan vulture (Gyps himalayensis) or **Himalayan griffon** vulture is an Old World vulture.
- It is one of the two largest Old World vultures and true raptors.
- It is a typical vulture which **has a bald white head**, wings that are very wide and short tail feathers.
- **Distribution:** It is native to **the Himalayas and the adjoining Tibetan Plateau** and also found in the Central Asian mountains.
- These are diurnal and mostly solitary species.
- **Conservation status**
  - **IUCN:** Near Threatened
- **Other Vulture species found in India**
  - India is home to 9 species of Vulture namely the Oriental white-backed, Long-billed, Slender-billed, Himalayan, Red-headed, Egyptian, Bearded, Cinereous and Eurasian Griffon.

The Iberian wolf is extinct in Spain's Andalusia

Iberian wolf:

- It is a **subspecies of Grey wolf** that has been isolated from mixing with other wolf populations for over a century.
- These form the largest wolf **population in Western Europe.**
- It is native to the Iberian Peninsula **comprising Spain and Portugal.**
- They inhabit **forests, inland wetlands, shrublands**, **grasslands, pastures**, and mountainous areas.
- They live, hunt, and travel in small packs. Each pack includes the alpha male and female with their young as well as older offspring.
- The **alphas are the leaders of the pack**, establishing the group's territory, selecting the den sites, tracking down, and hunting prey.
- They are **mainly carnivores.**
- **Conservation status**
    - **IUCN:** Vulnerable

Iberian Peninsula

- It is located on **Europe's southwestern tip.**
- It is part of the southern European peninsula, which comprises three peninsulas; Iberian, Balkan, and Italian peninsulas.
- Its southern tip is **separated from the African** continent by the **narrow Strait of Gibraltar.**
- This Peninsula lies **between the Mediterranean Sea and the Atlantic Ocean** and is separated from France by the Pyrenees mountain range.
- The highest mountain on the peninsula is **Mount Mulhacén**, with 3,478 m, located in the Andalusian **Sierra Nevada.**

Tiger Reserve: Tribals, Illegal Fishing Concern For Ap Tigers

- **Location**: It is located in the **Nallamala hill ranges** (an offshoot of the Eastern Ghats) of **Andhra Pradesh** and spreads across the undivided districts of Guntur, Prakasam, and Kurnool.
- It attained the **status of a Tiger Reserve in 1983.**
- This is the **largest tiger reserve in the country,** spreading over an **area of 5937 Sq. Km.**
- It is **named after two major dams** in the area, **Nagarjuna Sagar Dam** and **Srisailam Dam**.
- Two wildlife Sanctuaries, namely **Rajiv Gandhi Wildlife Sanctuary** and **Gundla Brahmeswaram Wildlife Sanctuary (GBM), constitute the Tiger Reserve**.
- The **river Krishna traverses through this** Reserve for a linear distance of around 270 kilometres.
- **Topography**: It consists of **plateaus, ridges, gorges, and deep valleys**.

- **Vegetation**: **Tropical dry deciduous forests** with an undergrowth of bamboo and grass.
- **Flora**: The habitat has s**everal endemics like Andrographis nallamalayana, Eriolaena lushingtonii,** Crotalaria madurensis Var, Dicliptera beddomei, and Premna hamiltonii.
- **Fauna**:
    - Top faunal species include **tigers, leopards, wolves, Wild dogs,** and jackals.
    - The **prey species** are represented by **Sambar, Chital, Chowsingha, Chinkara**, Mouse Deer, Wild boar, and Porcupine.
    - The **river Krishna has Muggers, otters, and Turtles.**

'Most poisonous' yellow-bellied snake found in Bay of Bengal

Yellow-bellied Sea Snake:

- The Yellow-bellied Sea Snake is a **highly venomous** species of snake that **belongs to the subfamily Hydrophiinae (the sea snakes).**
- **Scientific Name: Pelamis platurus**
- **Distribution**:
    - This snake is considered the **most widely-distributed** snake in the world.
    - It is found in **tropical and subtropical waters** around the world.
    - It is found in tropical ocean waters in the **Indian and Pacific Oceans,** including the coasts of **Africa, Asia, Australia, Mexico**, including Baja California, **and Central America.**
- **Features**:
    - Adult length **averages 3 feet (0.9 metres**). The snake has **smooth scales** and a **sleekly shaped body.**
    - It has a **distinctive bicolor pattern** with a **yellow underbelly** and **brown back and a flattened yellowtail** with **large black spots.**
    - It is **a diurnal sea** snake and **primarily aquatic**, living its **entire life cycle at sea.**
    - This snake **can spend up to 3 hours underwater** without surfacing.
    - Adaptations to aquatic life include **reduced ventral scale size, laterally compressed body and paddle-tail for swimming**, **valved nostrils** and **palatine seal for excluding seawater**, and cutaneous gas exchange for prolonging dive times.
    - This species can u**ptake up to 33% of its oxygen requirements through the skin while diving and swimming** at the surface of the water.
    - They are **carnivores (piscivores) and eat only fish**.
- **Conservation Status:**
    - **IUCN Red List: Least Concern**

Odisha apprehends medium flood in Mahanadi system Thursday

Mahanadi River

- It is one of the major **east-flowing peninsular rivers in India**.
- **Origin**: The river originates from the **Sihawa range of hills in the** Dhamtari district of **Chhattisgarh state.**
- **Length**: It flows a total **of 860 km** by distance before it **ends up in the Bay of Bengal.**
- **Course**:
    - It flows in a **southeastern direction through Chhattisgarh and Odisha.**
    - The **catchment area** of the basin e**xtends over major parts of Chhattisgarh and Odisha a**nd comparatively **smaller portions of Jharkhand, Maharashtra and Madhya Pradesh.**
    - **It passes through several major cities** and towns, including **Raipur, Sambalpur, and Cuttack.**
- The river is **bounded in the north by Central India hills**, in the **south and east by the Eastern Ghats** and **in the west by Maikal hill range.**
- **Tributaries**: The main tributaries of Mahanadi are **Seonath River, Jonk River, Hasdeo River, Mand River, Ib River, Ong River** and **Telen River**.
- **Hirakud Dam:**
    - The Hirakud Dam, the **world's longest earthen dam (26km**), is constructed **across the Mahanadi River**, about 15 km from Sambalpur in Odisha.
    - The dam is used for irrigation, flood control, and power generation.
- **Chilika Lake:** Chilika, named **wetland of international importance** under the Ramsar Convention, **gets 61% of its inland flow from the Mahanadi river system,** mainly from its distributaries - Daya and Bhargabi.
- It **ranks second to the Godavari River among the peninsular rivers in respect of water potential.**

Shri Kiren Rijiju says Samudrayaan project aims to send three personnel to 6 km depth in a submersible to study the deep sea resources

Samudrayaan Project

- It is **India's first manned mission to explore the deep ocean**.
- It is designed to **study the deep ocean resources** and **conduct biodiversity assessments** as well.
- The mission **will not disturb the ecosystem** as the submersible is **used solely for exploration purposes.**
- The project is part of the larger Deep Ocean Mission, which **supports the Central Government's Blue Economy policy.**
- The **Ministry of Earth Sciences** (MoES) **is the nodal ministry** to implement

this multi-institutional ambitious mission.

MATSYA 6000

- It is a **manned submersible vehicle developed by the National Institute of Ocean Technology (NIOT)**, Chennai.
- It was developed under the Samudrayaan mission to **facilitate humans in the deep ocean in exploring mineral resources.**
- It is designed with the **capability of operating in the deep sea for 12 hours** while in case of **emergency, it can also operate up to 96 hours** with all the **necessary measures for human safety.**
- **Expected to be launched in 2024-**25, **it would make India only one among six countries** (US, Russia, Japan, France, and China) to have piloted a crewed under-sea expedition beyond 5,000 metres.

Deep Ocean Mission

- It is a mission-mode project **to support the Blue Economy Initiatives** of the Government of India.
- It is a **high-level multi-ministerial**, **multi-disciplinary programme** for a better **understanding of the deep sea living and non-living resources of the Indian Ocean.**
- It will **aid in India's efforts to attain the Blue Economy status.**
- It aims to **develop technologies to harness living and non-living resources** from the deep oceans.
- The **Ministry of Earth Sciences (MoES) will be the nodal Ministry** implementing this multi-institutional Mission.
- The **estimated cost of the Mission will be 4077 crores for a period of 5 years** (2021-26) to be implemented in a phase-wise manner.
- The Mission consists of **six major components:**
    - **Development of Technologies for Deep Sea Mining** and **Manned Submersible and Underwater Robotics**;
    - Development of **Ocean Climate Change Advisory Services**;
    - **Technological innovations for exploration** and conservation of deep-sea biodiversity;
    - **Deep Ocean Survey and Exploration**;
    - **Energy and freshwater from the Ocean**;
    - **Advanced Marine Station for Ocean Biology;**

Uttarakhand's Nandakini River Swells After Heavy Rain, Water Enters Houses In Chamoli

Nandakini River

- Nandakini is **one of the five main tributaries of the Ganges River.**
- **Origin**: Originating in the **glaciers below Nanda Ghunti on the Nanda Devi Sanctuary**, the **river joins the Alaknanda at Nandprayag (870m**), which is

one of the panch prayags or holy confluences on the Alaknanda.

- **Course**:
  - It **flows through theChamoli district of Uttarakhand** primarily in the **Garhwal region**, covering a distance of **approximately 105 kilometres before merging with the Alaknanda** River **at Nandprayag**.
- It is **surrounded by the majestic Himalayan peaks**, including **Nanda Devi, Trisul, and Kamet.**
- **Cultural Significance:**
  - The river holds great **significance in Hindu mythology** and is considered sacred. It is **believed to be the abode of Lord Vishnu.**
  - The region surrounding the river is **dotted with ancient temples and shrines**.
  - The **most famous temple along the Nandakini River is the Nandprayag Temple**, dedicated **to Lord Vishnu**.
  - The temple is believed to have **been built by Adi Shankaracharya**, a renowned philosopher and saint.
- **Tributaries**: Several smaller streams and rivers join the Nandakini as it makes its way through the mountainous terrain. **One of the notable tributaries is the Pindar River.**
- The banks of the Nandakini River **are rich with wildlife and biodiversity**. The region is home to **several protected areas, including the Nanda Devi National Park** and the **Valley of Flowers National Park**.
- **The Nanda Devi National Park, a UNESCO World Heritage Site**, is home to a wide range of flora and fauna. The park **is known for its diverse ecosystem**, which **includes alpine meadows, high-altitude forests, and snow-capped peaks.**
- **The Valley of Flowers National Park,** on the other hand, is f**amous for its vibrant alpine flowers that bloom during the monsoon season**. It is also home to several rare and endangered plant species.

DMRC to make passengers aware about CO2 emissions reduction due to Metro travel

CarbonLite Metro Travel

- It is a new **initiative of the** DMRC to help **people understand their contribution to reducing CO2 emissions by opting for metro** rail services.
- With this initiative, **daily commuters will now be able to understand** and learn **about the average amount of Carbon Dioxide (CO2) emissions they are decreasing** with their simple step of selecting the metro as their means of transportation.
- The **amount of CO2 will be calculated based on a comparison to road-based motor vehicles.**
- It also **aims to persuade commuters to choose an environmentally friendly method of transportation** over motorised alternatives, thereby

supporting a cleaner and more ecologically balanced environment.

- The initiative is in **line with the Government of India's Mission Lifestyle for Environment (LiFE).**
- **Who can avail of this feature?**
    - **People travelling with QR code-based tickets** will be able to avail of this facility.
    - **Information about the decrease in CO2 emissions** caused by metro travel **will be prominently displayed on both mobile QR code tickets and physical tickets**.
    - **Supported by comprehensive research** conducted **by The Energy and Resources Institute (TERI)**, Delhi, the **initiative underscores that each kilometre travelled by metro train** instead of road vehicles **results in a noteworthy reduction of 32.38 gram of CO2 emissions.**
    - **The CO2 savings will be displayed and accumulated in the user's DMRC mobile app for all journeys undertaken** by the passenger, further enhancing his/her feel-good factor.

Mission LiFE (Lifestyle for Environment):

- It is an **India-led global mass movement to nudge individual and community action to protect** and preserve **the environment.**
- It was **launched by the Indian Prime Minister at the 26th UN Climate Change Conference of the Parties (COP26) in Glasgow**in November **2021**.
- The program hopes t**o "mobilize one billion Indians as well as people in other countries to become individuals who practice sustainable lifestyles**.
- The global movement will **showcase sustainable goals and climate actions taken by countries and individuals** around the world.
- It **makes the fight against climate change democratic**, in which everyone can contribute with their respective capacities.
- It **emboldens the spirit of the P3 model, i.e., Pro Planet People.**
- It **functions on the basic principles of 'Lifestyle of the planet, for the planet and by the planet'.**
- It **aims at following a three-pronged strategy** for changing people's collective approach towards sustainability,
    - **nudging individuals to practice** simple yet effective environment-friendly actions in their daily lives (**demand**)
    - **enabling industries and markets to respond** swiftly to the changing demand (**supply**)
    - **to influence government and industrial policy** to support both sustainable consumption and production (**policy**).

NGT asks Odisha government to stop 'illegal' construction in and around Tampara Lake

Tampara Lake:

- It is one of the largest fresh water **lakes in the State of Odisha.**
- The beautiful lake & the **nearby Chilika Lagoon** highlight the ecological diversity Odisha is blessed with.
- It supports at least 60 species of birds, 46 species of fishes, at least 48 species of phytoplanktons, and more than seven **species of terrestrial plants and macrophytes.**
- It is an important habitat for vulnerable species such as **Cyprinus carpio, common pochard (Aythya ferina), and river tern (Sterna aurantia).**
- It is already **placed in the Wetland Atlas prepared** by Ministry of Environment, Forest and Climate Change in 2010.

National Green Tribunal

- It has been established under the **National Green Tribunal Act 2010.**
- New Delhi is the Principal Place of Sitting of the Tribunal and Bhopal, Pune, Kolkata and Chennai shall be the other four places of sitting of the Tribunal.
- NGT is mandated to make disposal of applications or **appeals finally within 6 months of the filing of the same.**
- **Composition**
    - The Tribunal **comprises the Chairperson,** the Judicial Members, and Expert Members.
    - They shall hold office for **a term of 5 years** and are not eligible for reappointment.
    - The Chairperson is **appointed by the Central Government** in consultation with the Chief Justice of India (CJI).
    - A Selection Committee shall be formed by the central government to appoint the Judicial Members and Expert Members.
    - There are to be **at least 10 and a maximum of 20 full-time Judicial members** and Expert Members in the tribunal.

India was a tree planting laboratory for 200 years — here are the results

Allowing forests to regenerate on their own has been championed as a strategy for reducing planet-heating carbon in the atmosphere while also boosting biodiversity, the benefits ecosystems offer and even the fruitfulness of livelihoods.

While plantations on farms and barren land can provide firewood and timber, easing the pressure on natural forests and so aiding their regeneration, ill-advised tree planting can unleash invasive species and even dispossess people of their land.

Plantations in colonial-era India

- Britain needed great quantities of timber to lay railway sleepers and build ships in order to transport the cotton, rubber and tea it took from India. Through the Indian Forest Act of 1865, forests with high-yielding timber trees such as teak, sal and deodar became state property.
- To maximise how much timber these forests yielded, British colonial

authorities restricted the rights of local people to harvest much beyond grass and bamboo. Even cattle grazing was restricted.

- Meanwhile plantations of teak (*Tectona grandis*), a species well adapted to India's hot and humid climate and a source of durable and attractive timber, spread aggressively. Pristine grasslands and open scrub forest gave way to teak monocultures.
- Eucalyptus and other exotic trees which hadn't evolved in India were introduced from around 1790. British foresters planted pines from Europe and North America in extensive plantations in the Himalayan region as a source of resin and introduced acacia trees from Australia for timber, fodder and fuel.
- One of these species, wattle (*Acacia mearnsii*), first introduced in 1861 with a few hundred thousand saplings, was planted in the Nilgiris district of the Western Ghats.
- This area is what scientists all a biodiversity hotspot — a globally rare ecosystem replete with species. Wattle has since become invasive and taken over much of the region's mountainous grasslands.
- Similarly, pine has spread over much of the Himalayas and displaced native oak trees while teak has replaced sal, a native hardwood, in central India. Both oak and sal are valued for fuel, fodder, fertiliser, medicine and oil. Their loss, and the loss of grazing land, impoverished many.

Restoring forests in India today

- This focus on increasing the area of land covered with trees is reflected in India's national forest policy, which aims for trees on 33% of the country's area. Schemes under this policy include plantations consisting of a single species such as eucalyptus or bamboo which grow fast and can increase tree cover quickly, demonstrating success according to this dubious measure.
- Sometimes these trees are planted in grasslands and other ecosystems where tree cover is naturally low. The result is that afforestation harms rural and indigenous people who depend on these ecosystems for grazing and produce. The continued planting of exotic trees risks new invasive species, in a similar way to wattle 200 years ago.
- There are positive case studies too. The Forest Rights Act of 2006 empowered village assemblies to manage forest areas which had once been in traditional use. Several assemblies (known as *Gram Sabhas*) in the Gadchiroli district of central

Heronries are thriving in Thiruvananthapuram district, says a WWF survey

Heron

- These are any of about 60 **species of long-legged wading birds.**
- These are classified in **the family Ardeidae** (order Ciconiiformes) and generally including several species usually called egrets.
- The Ardeidae also include the bitterns (subfamily Botaurinae).

- These are widely distributed over the world but **are most common in the tropics**.
- They usually feed while wading quietly in the **shallow waters of pools, marshes**, and swamps, catching frogs, fishes, and other aquatic animals.
- They nest in rough platforms of sticks constructed in bushes or trees near water; the nests usually are grouped in colonies called heronries.

Significance of the Heronry count

- Heronry counts aims at counting '**apparently occupied nests' of herons, egrets, and other colonial waterbirds.**
- This is regarded as an effective and accurate way to determine the **breeding population of waterbirds in an area.**
- Being one of the top predators in the aquatic food chain, monitoring their population can indicate the health of the aquatic ecosystem, freshwater as well as brackish water.

Ecological well-being of Jammu & Kashmir stands at a critical juncture

The region, which is an "eco-fragile zone", is confronted with environmental challenges due to global warming, unplanned urbanisation, deforestation and encroachment of water bodies.

Haphazard development has been wreaking havoc on this fragile ecosystem over the last few years and the infrastructure projects in the pipeline are likely to further it.

- 38,000 trees in Jammu's Raika Forest are to be cut soon to construct the new high court building.
- The Raika Forest, often referred to as the 'Lungs of Jammu,' plays a crucial role in absorbing carbon dioxide, mitigating climate change, and providing a habitat for a wide array of flora and fauna, including endangered species.
- The proposed felling of around 38,000 trees will not only lead to soil erosion and increased air pollution but also intensify human-animal conflicts in the area. The displacement of wildlife from Raika will disturb the delicate balance of the ecosystem, affecting the local **Gujjar community**, whose symbiotic relationship with the forest is critical to their lives and livelihoods.
- Furthermore, the two major lakes in the Kashmir Valley — **Wular and Dal** — are also witnessing the brunt of declining water levels, triggered by unplanned infrastructural projects. NASA released a satellite image of the shrinking Wular Lake on June 23, 2020.
- Data from the Indian Space Research Organization's (ISRO) LISS-IV instrument — also found Wular Lake's open water area had shrunk in size by about one-quarter between 2008 and 2019. The smaller Dal Lake has suffered a similar fate in response to land cover change.
- Both lakes regulate water flowing down from Himalayan glaciers and along the Jhelum river and supply water for drinking and irrigation.
- It also jeopardises the availability of drinking water and irrigation for

communities along the Jhelum.

Lithium Extraction

- Earlier in May, the Ministry of Mines said they would begin auctioning lithium reservoirs in December amid growing environmental concerns of the people of **Reasi**. And the Centre said 5.9 million tonnes of lithium reserves have been found for the first time in the country in J&K in February. The ministry is planning to auction these lithium blocks later this year.
- Lithium, also known as 'white gold', is a key component in the production of batteries for electric vehicles and renewable energy storage.
- There has been a growing interest in mining lithium reserves in the region. While this may bring economic benefits, it raises questions about the environmental impact of mining on fragile ecosystems and local communities.
- It has triggered a debate about the environmental fallout of mining in the ecologically sensitive Himalayas. Like mining and exploration of other minerals, lithium mining is also responsible for polluting air, water and soil.
- Lithium extraction is a water-intensive process that can lead to significant water wastage. According to an estimate, 2.2 million litres of water is needed to extract one tonne of lithium.
- Second, lithium is extracted from hard rocks and underground brine reservoirs. As lithium extraction can result in Joshimath-like incidents in Reasi district, the agencies involved in mining should not ignore the environmental aspect.
- The human resettlement and rehabilitation in the Reasi district is highly sensitive as the majority of the people in Reasi live below the poverty line and there is a good population of pastoralists who earn their livelihood by rearing livestock in the meadows and pastures.

The ecological well-being of J&K stands at a critical juncture. The impending deforestation, the shrinking of the lakes and the potential lithium mining pose significant environmental challenges.

Why a new snake species has been named after Harrison Ford

Tachymenoides harrisonfordi

- It was discovered in May 2022 by a team of researchers from the United States, Germany and Peru.
- It was discovered in **the Peruvian Andes mountain region.**
- **Appearance:**
    - It measures 16 inches (40.6 centimetres) in length and is yellowish-brown with scattered black blotches, a black belly and a vertical streak over its copper-coloured eye.
- This is **the third animal species** to be named after Ford. Earlier, an ant (**Pheidole harrisonfordi) and a spider (Calponia harrisonfordi)** were named

after him.

Andes mountain region

- It is also called the Andes, Spanish Cordillera de los Andes or Los Andes, mountain system of **South America.**
- The mountain **range spans seven countries** — Venezuela, Colombia, Ecuador, Peru, Bolivia, Chile and Argentina.
- It consist of a vast series of **extremely high plateaus** surmounted by even higher peaks that form an unbroken rampart over a distance of some 8,900 kilometres
- The highest peak of this range is **Mount Aconcagua**(6,959 metres) on the border of **Argentina and Chile.**
- **Climate**
    - The **northern part of** the Andes is typically **rainy and warm,** and the weather is also wet in the eastern part of central Andes, and the area to the southwest.
    - To the west, the dry climate is dominated by the Atacama Desert in northern Chile.
    - The mountains form **a rain cover over the eastern plains of Argentina**, which have extremely dry weather.

Gabon announces $500 million debt-for-nature swap deal for marine conservation

- Under the debt-for-nature swap, Gabon has agreed to a deal with the Bank of America, the US International Development Finance Corporation (USDFC) and The Nature Conservancy (TNC), to **refinance $500 million** in **national debt toward marine conservation efforts in the country.**

Debt-for-nature swap

- **What it is?** It allows **heavily indebted developing countries** to seek help from financial institutions in the developed world with **paying off their debt if they agree to spend on conservation of natural resources.**
- The notion of debt-for-nature swaps was first mooted in 1984 by Thomas Lovejoy, the former vice-president for science at the World Wildlife Fund-US, in response to the Latin American debt crisis.
- The **first debt-for-nature swap** was a third-party deal facilitated by Conservation International. Finalised in 1987, it involved foreign creditors agreeing **forgive USD 650,000 of Bolivia's debt in exchange** for the country setting aside 1.5 million hectares in the Amazon Basin for conservation efforts.

benefits

- Debt-for-climate swaps provide benefits for both creditors and debtors.

- **Creditors** can **advance their development cooperation and climate finance** goals, improve their chances of debt recovery, and strengthen their diplomatic ties with debtor nations.
- **Debtors** can **reduce their external debt and debt service obligations**, allocate fiscal resources towards other development priorities, promote climate action through domestic investment.

Order of the National Green Tribunal regarding quarrying activities carried out in the Eco-Sensitive Zone of Kuldiha Wildlife Sanctuary

Kuldiha Wildlife Sanctuary

- It is a major wildlife **sanctuary in Odisha** which was established in 1984.
- It is spread across the **Chota Nagpur Plateau region.**
- It is connected with Simlipal Reserve via Nato and Sukhupada Hill ranges.
- **Flora:** It contains mixed deciduous forest.
- **Fauna:** It consists of lot of wild animals like the tigers, elephants, leopards, bison, gaur, giant squirrels and sambar etc.

National Green Tribunal

- It has been established under **the National Green Tribunal Act 2010.**
- New Delhi is the Principal Place of Sitting of the Tribunal and Bhopal, Pune, Kolkata and Chennai shall be the other four places of sitting of the Tribunal.
- NGT is mandated to make disposal of applications or **appeals finally within 6 months** of the filing of the same.
- **Composition**
    - The tribunal comprises the Chairperson, the Judicial Members, and Expert Members.
    - They shall hold office **for a term of 5 years** and are not eligible for reappointment.
    - The Chairperson **is appointed by the Central Government** in consultation with the Chief Justice of India (CJI).
    - A Selection Committee shall be formed by the central government to appoint the Judicial Members and Expert Members.
    - There are to be at least 10 and a maximum of 20 full-time Judicial members and Expert Members in the tribunal.

Pacific islands face risk of drowning as sea levels rising faster than expected

State of the Climate in the South-West Pacific 2022 report

- The sea level **rise threatens low-lying islands such as Tuvalu and the Solomon Islands,** which could face devastating floods over time, leading to the destruction of agricultural lands and habitable areas.

- The report also highlighted the **occurrence of marine heatwaves in** a large area northeast of **Australia and south of Papua New Guinea** over a period of more than six months.
- These heatwaves have had a significant impact on marine life and the livelihoods of local communities.
- Despite a decrease in the number of reported disaster weather events compared to 2021, the **economic losses due to flooding and weather events have increased.**

World Meteorological Organization

- It is a specialized **agency of the United Nations (UN).**
- It is the UN system's authoritative voice on the state and behaviour of the Earth's atmosphere, its interaction with the oceans, the climate it produces, and the resulting distribution of water resources.
- It originated from the **International Meteorological Organization** (IMO), which was founded in 1873.
- Established in 1950, WMO became the specialized agency of the UN for meteorology (weather and climate), operational hydrology and related geophysical sciences.
- **Headquarters:** Geneva, Switzerland.
- Currently it has a **membership of 191 countries.**
- **Governance Structure:**
    - Its **supreme body is the World Meteorological Congress**, which consists of representatives of all members. It meets at least every four years to set general policy and adopt regulations.
    - A 36-member Executive Council meets annually and implements policy.
    - **The Secretariat**, headed by a secretary-general appointed by the congress for a four-year term, serves as the administrative centre of the organization.

Government notifies norms for green hydrogen

Green Hydrogen Standard

- The Ministry of New & Renewable Energy has decided to define Green Hydrogen as having a **well-to-gate emission** (i.e., including water treatment, electrolysis, gas purification, drying and compression of hydrogen) of **not more than 2 kg CO2 equivalent / kg H2.**
- The **Bureau of Energy Efficiency** (BEE), Ministry of Power shall be the **Nodal Authority for accreditation of agencies** for the monitoring, verification and certification for Green Hydrogen production projects.
- The scope of the definition **encompasses both electrolysis-based** and **biomass-based hydrogen production methods.**

Green Hydrogen

- **Hydrogen gas**(produced using industrial methods like electrolysis) can be used as a fuel and it does not release greenhouse gas (GHG) emissions such as carbon dioxide (CO2) when it is burned. Hence, a potential clean alternative to fossil fuels.
- **Green hydrogen**is the name given to hydrogen gas that **has been produced using renewable energy,** such as wind or solar power, which create no GHG emissions.
- Globally, most of the hydrogen produced today is used in the refining and industrial sectors - to make ammonia for the fertiliser industry, in the steel industry.
- In a fuel cell (device that converts the energy of a chemical into electricity), hydrogen **gas reacts with oxygen to produce electricity and water vapour.**

Hangul population witnesses marginal rise in Kashmir

Kashmir stag

- It is also called Hangul which is a **subspecies of Central Asian red deer** endemic to Kashmir and surrounding areas.
- It is found in dense riverine forests in the high valleys and mountains of Jammu and Kashmir and northern Himachal Pradesh.
- In Kashmir, it is found primarily in **the Dachigam National Park** where it receives protection.
- A small population has also been witnessed in **Overa-Aru Wildlife Sanctuary** in south Kashmir.
- **Conservation status**
    - **IUCN:** Critically Endangered
    - **CITES :** Appendix I

Dachigam National Park

- The actual beauty of the park lies in the **deep valleys, rocky outcrops, steep wooded** slopes and rolling alpine pastures.
- Being located in a mountainous area, Dachigam National Park faces a huge variation in **altitude** that ranges from **1600 m to 4200 m above sea level.**
- This variation in altitude categorises Dachigam National Park into **two regions- the upper region and the lower region.**
- **Flora:** It is extremely rich in Wild Cherry, Pear, Plum, Peach, Apple, Apricot, Walnut, Chestnut, Oak and Willow etc.
- **Fauna:** Hangul (Kashmir Stag), Musk deer, Brown Bear, Leopards, Jungle Cats, Himalayan black bear, and a few species of wild goats like the markhor and ibex.

With nimble feet, clouded leopards play hide-and-seek in the forests

Clouded leopard

- It is a wild cat inhabiting dense **forests of the Himalayas** through mainland Southeast Asia into South China.
- The clouded leopard is **categorised into two species**: the **mainland clouded leopard** distributed from central Nepal to peninsular Malaysia, and **the Sunda clouded leopard** (Neofelis diardi) native to Borneo and Sumatra.
- The mainland clouded leopard (Neofelis nebulosa) is **often likened to the Ice Age sabretooth** because it has the largest canines in proportion to its skull size among all cat species.
- It also has **rotating rear ankles** that enable it to climb down head first from trees, unlike the other felines.
- They seemed to go wherever they pleased without worrying about other predators, primarily because of their ability to climb trees, even hang upside down from large branches.
- It most often **inhabits primary evergreen tropical forests** and also lives in secondary forests, logged forests, dry tropical forests, grassland, mangrove swamp, scrubland, and coastal hardwood forest.
- In India, it is found in Sikkim, northern West Bengal, Meghalaya subtropical forests, Tripura, Mizoram, Manipur, Assam, Nagaland and Arunachal Pradesh.
- It is **the State animal of Meghalaya.**
- **Conservation status**
    - **IUCN:** Vulnerable

10 arrested for hunting, encroachment of forest land near Kuno National Park

Kuno National Park

- **Location**:
    - It is located in the **Sheopur district in Madhya Pradesh.**
    - It is **nestled near the Vindhyan Hills.**
- It is **named after the Kuno River** (One of the main tributaries of the Chambal River) **that cuts across it.**
- Initially established as a wildlife sanctuary, it was **only in 2018 that the government changed its status into a national park.**
- Kuno National Park was **selected under 'Action Plan for Introduction of Cheetah in India'.**
- **Vegetation**: Kuno is **primarily a grassland region**, though a few rocky outcrops are found here too.
- **Flora**:
    - **Kardhai, Salai, and Khair trees dominate the forested area** of Kuno National Park, which is **mostly mixed forest.**
    - The park has a total of **123 tree species, 71 shrub species**, 32 exotic

and climbing species, and **34 bamboo and grass species**.
- **Fauna**: The protected area of the forest is **home to the jungle cat, Indian leopard, sloth bear, Indian wolf**, striped hyena, golden jackal, Bengal fox and dhole, along with more than 120 bird species.

Project Cheetah:

- **World's first inter-continental large wild carnivore translocation project.**
- Project Cheetah was **approved by the Supreme Court of India in January 2020 as a pilot programme** to reintroduce the species to India.
- **Close to 50 cheetahs will be introduced into the wild over the next five years.**

Assam's Manas Tiger Reserve 63% short of staff, activist tells Environment Minister

- It is located in the **foothills of Himalayas in Assam**. It is contiguous with the Royal Manas National Park in Bhutan.
- It is a **national park, UNESCO Natural World Heritage site, a Project Tiger reserve**, an elephant reserve and a biosphere reserve.
- **Flora:** It contains some of the largest remaining grassland habitats in the sub-Himalayan grassland ecosystems.
- **Fauna:** The Park is known for its rare and endangered endemic wildlife such as the Assam roofed turtle, hispid hare, golden langur and pygmy hog.
- The name of the park originates from **the Manas River**, which is named after the serpent goddess Manasa.
- The Manas River is a major tributary of Brahmaputra River, which passes through the Manas National Park.

Sloth bear trapped in the Nilgiris, relocated

Sloth Bear

- Sloth bears are one of the eight bear species found across the world.
- **Scientific Name: Melursus ursinus**
- **Distribution:**
  - Their range includes **India, Sri Lanka and southern Nepal**.
  - **90%** of the global **Sloth Bear population is found in India.**
- **Habitat**: They live in a **variety of dry and moist forests** and in **some tall grasslands**, where boulders, scattered shrubs and trees provide shelter.
- **Features**:
  - They have long, shaggy dark brown or black fur and curved claws, which are the longest out of any of the bear species.
  - They use their claws to excavate termites and ants.
  - Size: They grow 5 to 6 feet (1.5 to 2 meters) long, stand 2 to 3 feet (0.5

to 1 meters) high at the shoulder, and weigh, on average, 90 to 140 kilograms.
    - They have poor senses of sight and hearing but a good sense of smell.
    - Sloth bears' nostrils can close completely, protecting the animals from dust or insects when raiding termite nests or beehives.
- **Conservation Status:**
    - **IUCN:** Vulnerable
    - Indian Wildlife Protection Act, 1972: Schedule 1

Rare black eagle spotted at Chail wildlife sanctuary

Black Eagle

- It belongs to the **family Accipitridae** and is the only member of the genus Ictinaetus.
- These are large and distinctive dark eagles of forested mountains and hills.
- The distinguishing feature of the majestic bird is its striking yellow beak, a vibrant contrast to its black feathers.
- They soar over forests in **the hilly regions of tropical and subtropical South and Southeast Asia,** as well as southeastern China.
- **Distribution:** They are found in the **Indian states of Himachal Pradesh and Jammu & Kashmir**, forests of the **Eastern and Western Ghats in peninsular India.**
- **Conservation status**
    - **IUCN:** Least concern

Chail wildlife sanctuary

- It is located in the state of **Himachal Pradesh.**
- It comprises part of the catchment area of a **tributary of the Giri River.**
- **Flora:** It is densely covered by Oak and Pine, apart from grassland.
- **Fauna:** It includes animal species of wild boar, goral, sambar, spotted deer, Himalayan black bear, common langur, Indian porcupine, flying squirrel, etc.

NGT keeps clearance for harbours in Kaluveli in abeyance

Kaliveli Bird Sanctuary

- This wetland is **the second-largest brackish water lake** in South India after Pulicat Lake.
- The first declaration was issued by the Villupuram District Administration under Section 18 of the Wildlife Protection Act, 1972, for setting up this sanctuary.
- The Kaliveli Lake is connected **to the Bay of Bengal by the Uppukalli Creek** and the Edayanthittu sanctuary and is visited for nesting by migratory birds

on the Central Asian flyway.
- The southern part of the wetland **has been reserved land** since 2001.
- The lake has a feeding ground for long-distance migrants from the cold subarctic regions of Central Asia and Siberia, including Black-tailed Godwits, Eurasian Curlew, White Stork, Ruff and Dublin.

National Green Tribunal (NGT)

- The National Green Tribunal has been established **under the National Green Tribunal Act 2010.**
- New Delhi is the Principal Place of Sitting of the Tribunal, and Bhopal, Pune, Kolkata and Chennai shall be the other four places of sitting of the Tribunal.
- NGT is mandated to make disposal of **applications or appeals finally within 6 months** of the filing of the same.
- **Composition**
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    - The **Chairperson is appointed by the Central Government** in consultation with the Chief Justice of India (CJI).
    - A Selection Committee shall be formed by the central government to appoint the Judicial Members and Expert Members.
    - There are to be at least 10 and a maximum of 20 full-time Judicial members and Expert Members in the tribunal.

New specie, genus of snakes discovered in Western Ghats

Sahyadriophis uttaraghati

- The **new genus has been named Sahyadriophis,** a combination of the **Sanskrit word for the Western Ghats 'Sahyadri'** and the **Greek word for snakes 'Ophis'.**
- **The new specie**s, **located in the northern part of the Western Ghat**s, is called **Sahyadriophis uttaraghati or Northern Sahyadri keelback.**
- **Features**:
    - These snakes are mostly **active during monsoons** and are **often found near streams.**
    - Their **diet primarily consists of frogs and their eggs.**
    - These snakes **are gentle in nature** and **rarely bite** when handled.
    - The **juveniles bear a big blotch or a collar mark on the nape**, **which distempers as the animal grows.**
    - It can be **differentiated from its southern counterpart—Sahyadriophis beddomei** (Beddome's Sahyadri keelback)—**by a longer tail and higher number of scales on the tail's underside**, known as subcaudals.

Colubrid snakes

- A colubrid is **any of the numerous**, diverse, **largely nonvenomous snakes** that comprise the r**eptile family Colubridae.**
- The Colubridae family **is one of the largest snake families, consisting of over 1,800 species.**
- They are **characterised by the absence of hind limbs.**
- They are **found in various regions** around the world, **except for Antarctica and some remote oceanic islands.**
- **Habitats**: They inhabit a wide range of environments, including **forests, grasslands, deserts, wetlands, and aquatic habitats.**
- **Venom**:
    - The **majority of colubrid snakes are non-venomous.**
    - However, there are a **few exceptions** within the Colubridae family, **such as the rear-fanged snakes,** which possess mild venom but are not considered dangerous to humans.
- Among w**ell-known colubrids are king snakes, watersnakes, milk snakes, gartersnakes, racers, ratsnakes,** ring-necked snakes, hog-nosed snakes, and the venomous boomslangs.

How thousands of emperor penguin chicks died in Antarctica

Emperor Penguin

- It is the **largest of the world's penguin species found only in Antarctica.**
- **Scientific Name: Aptenodytes forsteri**
- **Distribution**:
    - They are found throughout the **Antarctic continent and sub-Antarctic islands.**
    - **In breeding months** (April to November), emperor penguin colonies **are found between 66° and 78° south latitude along the Antarctic coastline.**
- **Habitat**:
    - It is the **most ice-adapted of any penguin species**, inhabiting **pack ice and surrounding marine areas.**
    - They spend their **entire lives on Antarctic ice and in its waters.**
- **Features**:
    - They are approximately **120cm tall and weigh in at around 40 kg.**
    - They **gain and lose weight rapidly during breeding and feeding season** On average, **females tend to weigh 18 kg less** than males.
    - They have a **gray back, white belly, and orange markings behind their eyes and** at the **top of their chest.**
    - They have **large stores of insulating body fat** and several **layers of scale-like feathers** that protect them from icy winds.
    - They **also huddle close together in large groups to keep t**hemselves and each other **warm**.

    - **Breeding**:
        - They **breed in the winter**.
        - After a courtship of several weeks, a **female emperor penguin lays one single egg and then leaves.**
        - **Each penguin egg's father balances it on his feet and covers it with his brood pouch**, a very warm layer of feathered skin designed to keep the egg cozy.
        - There, the **males stand for about 65 days through icy temperatures**, cruel winds, and blinding storms.
        - **Finally, after about two months, the females return from the sea, bringing food** they regurgitate or bring up to feed the now-hatched chicks.
- **Conservation Status:**
    - **IUCN Red List: Near Threatened**

To combat Delhi pollution, CSIR-NEERI plans grid-based mitigation strategy

National Environmental Engineering Research Institute (NEERI)

- It is a **premier research institute** created and **funded by the Government of India dedicated to environmental science and engineering.**
- The institute's p**rimary mission is to conduct research and development activities** related to various aspects **of environmental management, pollution control, and sustainable development.**
- NEERI falls u**nder the Ministry of Science and Technology** of the central government.
- It was **established in Nagpur in 1958 with a focus on water supply, sewage disposal, and communicable diseases,** and to some extent on industrial pollution and occupational diseases found common in post-independent India.
- **Headquarters: Nagpur**
- NEERI has **five zonal laboratories at Chennai, Delhi, Hyderabad, Kolkata and Mumbai.**
- **Organizational Expertise: Climate/Environment, Health, Lab or Field Testing**, Monitoring and Evaluation, **Policy Development, Research**, Standards, Technology and Fuel R&D.

Council of Scientific and Industrial Research (CSIR)

- It is one of I**ndia's premier scientific and industrial research organisations.**
- It was **established as an autonomous body by the government of India in 1942** to **promote scientific knowledge and boost industrialisation and economic growth**.
- It is now one of the largest **publicly funded R&D organisations in the world.**
- **Headquarters: New Delhi**
- CSIR **maintains a large network of national laboratories and field station**s

and employs thousands of scientists, researchers, and support staff.

- **Prominent laboratories: Cellular and Molecular Biology (Hyderabad), the Central Electronics Engineering Research Institute (Pilani),** the Central Institute of Mining and Fuel Research (Dhanbad), the National Aerospace Laboratories (Bengaluru), the National Institute of Oceanography (Goa), and the National Botanical Research Institute (Lucknow).

NTCA gives in-principle nod to Kumbhalgarh Tiger Reserve

Kumbhalgarh Wildlife Sanctuary

- **Location**: It is situated in the **Rajsamand district of Rajasthan.**
- Covering a total surface area of **578 sq km** and **stretching across the Aravalli ranges**, it **encircles parts of Udaipur, Rajsamand, and Pali districts.**
- **Once the hunting grounds of royals,** this area was **declared a wildlife sanctuary in 1971.**
- The wildlife sanctuary **encompasses the historic Kumbhalgarh Fort**and is also named after the fort.
- It acts as a **dividing line between Mewar and Marwar,** two different parts of Rajasthan.
- **Rivers**:
    - **River Banas** also graces the sanctuary and is the **primary source of water.**
    - The **rainwater on the western slopes flows as small rivers such as Sukdi, Mithdi, Sumer and Kot,** all of which are the **tributaries of River Luni** that ultimately merge into the Arabian Sea.
- **Flora**:
    - Many types of flora are found here, mainly a v**ariety of herbal flora like Dhok, Salar and Khair**.
    - Many trees and plants and **medicinal plants with herbal properties** are also included in it.
- **Fauna**:
    - It provides a suitable habitat for endangered and rare wild animals, including **four-horned antelope, sambar, wild boar, nilgai, sloth bear, leopard and caracal.**
    - There are a **large number of birds** to be sighted here, the most common one spotted here is the **grey jungle fowl.**

172 incidents of seizures of red sand boa recorded from 2016 to 2021: WCS-India report

Red Sand Boa

- Red Sand Boa (Eryx johnii) is a species in the subfamily Erycinae of the family

Boidae.

- It is commonly called the **Indian Sand Boa** is a **non-venomous species** found throughout the **dry parts of the Indian subcontinent**.
- It is **ovoviviparous and nocturnal** and spends the majority of its time under the ground.
- **Distribution:** The species is endemic **to Iran, Pakistan, and India.**
- **Appearance:**
    - It is a primarily **reddish-brown and thick-set snake** that grows to an average length of 75 cm.
    - Unlike most snakes, the tail is almost as thick as the body and gives the reptile the **appearance of being "double-headed".**
- **Ecologically importance**
    - Like other snake species, the Red Sand Boa also plays a significant role in the ecosystem by maintaining a **healthy population between prey and predator.**
    - It feeds on rodents, lizards, and even other snakes.
- **Conservation Status**
    - **IUCN:** Near Threatened
    - **Wildlife (Protection) Act, 1972:** Schedule IV
    - **CITES:** Appendix II

Cyclone frequency may rise over Indian coast from the warming of Pacific: study

- The number of such equatorial-origin cyclones was 43% fewer in 1981-2010 compared with 1951-1980, and this was because the PDO was in a 'warmer' or positive phase.
- A warming of the Central Equatorial Pacific, called an El Nino, frequently corresponds to reduced rainfall over India whereas cooler-than-normal temperatures, or a La Nina, is linked to excessive rainfall. This pattern collectively called the El Nino Southern Oscillation (ENSO) phenomenon, repeats in the Pacific over two-seven years.
- However, the PDO isn't an annual occurrence and, on average, corresponds to a warmer than average Western Pacific Ocean and relatively cooler Eastern Pacific, though this plays out over much longer time scales.
- However, unlike an ENSO, whose stage can be determined any year, a 'positive' or 'warmer phase' of a PDO can be known only after several years of measuring ocean temperatures and their interaction with the atmosphere.

Pacific Decadal Oscillation (PDO)

- It is a long-term ocean **fluctuation in the Pacific Ocean.**
- The term PDO was coined in about 1996 by Steven Hare at the University of Washington.
- It can be known **only after several years of measuring ocean temperatures** and their interaction with the atmosphere.

- The PDO waxes and wanes **approximately every 20 to 30 years.**
- From ocean surface topography data, together with other ocean and atmospheric data, scientists can determine **whether we are in a 'cool' phase or a 'warm' phase.**
    - **Cool phase:** It is characterised by a cool wedge of lower-than-normal sea-surface heights/ocean temperatures **in the eastern equatorial Pacific and a warm horseshoe pattern** of higher-than-normal sea-surface heights connecting **the north, west and southern Pacific.**
    - **Warm' or 'positive' phase:** In this, the **west Pacific Ocean becomes cool,** and the wedge in the east warms.

How does this affect climate?

- The change in location of the cold and warm water masses **alters the path of the jet stream.**
- The jet stream in the northern hemisphere **delivers storms across the United States.**

Invasive alien species in focus at 10th plenary of IPBES

Invasive alien species are a key driver of biodiversity loss and they are part of the targets set under the Kunming-Montreal Global Biodiversity Framework (GBF) adopted by 193 members of the Convention on Biological Diversity in December 2022. The GBF has 23 targets that have to be met by 2030.

The aim is to prevent and reduce the rate of introduction and establishment of invasive alien species by at least 50 per cent by 2030.

IPBES

- It is an **independent intergovernmental** body established in 2012.
- It provides policymakers with objective scientific assessments about the state of knowledge regarding the **planet's biodiversity, ecosystems and the benefits they provide to people**, as well as the tools and methods to protect and sustainably use these vital natural assets.
- This independent body was inspired **by the Intergovernmental Panel on Climate Change** (IPCC) and the Millennium Ecosystem Assessment.
- It is not **a United Nations body**. However, at the request of the IPBES Plenary and with the authorisation of the UNEP Governing Council in 2013, **the United Nations Environment Programme (UNEP) provides secretariat services** to IPBES.
- **India is a member** country of this organisation.
- **Organisation's structure**
    - **Plenary:** The governing body of IPBES – made up of the representatives of IPBES member States – **usually meets once per year.**
    - **Observers:** Any State not yet a member of IPBES; the Convention on Biological Diversity (CBD) and other biodiversity-related conventions;

related UN bodies; as well as many other relevant organisations and agencies.

- **Bureau:** Comprising the **IPBES Chair, four Vice-Chairs and five additional officers** who oversee the administrative functions of IPBES.
- **Multidisciplinary Expert Panel (MEP):** Five expert participants from each of the five UN regions overseeing all IPBES scientific and technical functions.
- **Stakeholders:** All contributors to and end-users of the IPBES outputs.
- **Expert Groups & Taskforces:** Selected scientists and knowledge holders carrying out the IPBES assessments and other deliverables.
- **Secretariat** (Includes Technical Support Units): Ensures the efficient functioning of IPBES through support to the Plenary, Bureau and MEP, as well as implementing the Platform's work and administrative functions.

SCIENCE & TECHNOLOGY

Number of Metaverse users to surpass 600 million by 2026 due to generative AI

Metaverse

- It refers to a **virtual or digital universe** where **people can interact with each other and digital objects in a shared online space.**
- **Origin of the term:** The term "metaverse" **first appeared in author Neal Stephenson's 1992 science-fiction novel Snowcrash**, which describes a future where millions of people use virtual avatars to participate in a cyberspace realm.
- The metaverse is **essentially an interconnected network of virtual worlds**, **augmented reality, and virtual reality environments accessible through the internet.**
- In this digital realm, **users can create avatars, socialize with others, engage in various activities,** explore virtual landscapes, and even conduct business or trade virtual goods and services.
- **Elements** of the metaverse **include virtual reality (VR) platforms, augmented reality (AR)** experiences, **online games, social media**, virtual commerce, and virtual art galleries, among others.
- The metaverse aims to offer a seamless and immersive experience, **blurring the lines between the physical and digital worlds.**
- Companies such as Meta (formerly Facebook), Microsoft, and Roblox are all investing heavily in the metaverse, and it is seen as a potential major driver of growth in the technology industry in the coming years.

Augmented Reality (AR)

- It is an **enhanced version of the real physical world** that is achieved **through the use of digital visual elements, sound, or other sensory stimuli** and delivered via technology.
- It **overlays digital content onto real-life environments** and objects.
- AR works by **superimposing digital information onto real-world objects** to **create a 3D experience** that allows users to interact with both the physical and digital worlds.
- **Unlike Virtual Reality (VR), which creates its own cyber environment, AR adds to the existing world as it is.**

Virtual Reality (VR)

- It is a **simulated 3D environment that enables users to explore and interact with virtual surroundings** in a way that approximates reality as it is perceived through the users' senses.
- The environment is **created with computer hardware and software**, and the **users need to wear devices such as helmets or goggles** (Virtual Reality headsets or helmets) to interact with the environment.

Why room temperature superconductivity remains science's elusive Holy Grail

Last week, two South Korean researchers posted two related papers on the internet, not yet peer-reviewed, claiming that a lead-based compound they had developed had shown superconducting properties at room temperature, under normal pressure conditions.

Superconductivity

- Superconductivity refers to a state in which a material offers zero, or near-zero, resistance to electric current. A current is nothing but the movement of charged particles, electrons in most cases, in a particular direction. When the electrons move, they collide, and interact, with other atoms in the material.
- The movement is not entirely smooth, it encounters resistance which, as of now, is an essential property in electrical conductivity. Resistance involves a loss of energy, mostly in the form of heat. Part of the reason why electrical appliances get heated is this resistance.
- Elimination of this resistance can result in super-efficient electrical appliances, removal of transmission losses in power cables, and massive gains in energy. But that is not all. Superconducting materials show very interesting behaviour under magnetic field which allows the functioning of systems like the MRI scan machine and the superfast Maglev trains that float above the tracks. Superconductors have very critical uses in a wide variety of other scenarios as well.

Extremely low temperatures:

- As of now, superconductivity can be achieved only at very low temperatures, more than 250 degree Celsius below zero, very close to absolute zero which is – 273 degree Celsius.
- The first material to have been discovered to show super conductive properties was Mercury, which becomes a superconductor at close to 270 degree Celsius below zero. Most of the other materials commonly used as superconductors – Lead, Aluminum, Tin, Niobium, and several others – also become superconducting at comparable temperatures, called critical temperature.
- In some cases, materials can exhibit superconductivity at slightly higher temperatures as well, but under increased pressure conditions. It is all about creating the right kind of conditions for the electrons in the material to move without resistance, and a variety of tweaks are experimented with depending upon the internal atomic structure of the material.

Court seeks details on lumpy skin disease control measures

Lumpy Skin Disease (LSD)

- It is an acute to chronic, highly **infectious viral disease that affects cattle**.
- **Causative Agent:** It is caused by the **lumpy skin disease virus (LSDV),** which belongs to the **genus capripoxvirus**, a part of the **poxviridae family** (**smallpox and monkeypox viruses are also a part of the same family**).
- LSDV is **not a zoonotic virus**, meaning the **disease cannot spread to humans.**
- **Symptoms**:
    - LSD **affects the lymph nodes** of the infected animal, **causing the nodes to enlarge and appear like lumps on the skin**, which is where it **derives its name from.**
    - **The cutaneous nodules**, 2–5 cm in diameter**, appear on the infected cattle's** head, neck, limbs, udder, genitalia, and perineum.
    - The **nodules may later turn into ulcers** and **eventually develop scabs** over the skin.
    - The **other symptoms include high fever, sharp drop in milk yield**, **discharge from the eyes and nose**, salivation, loss of appetite, depression, damaged hides, emaciation (thinness or weakness) of animals, **infertility, and abortions**.
- **Transmission:**
    - by **blood-feeding insects**, such as certain species of flies and mosquitoes, or ticks;
    - by the **movement of affected animals;**
    - by **contaminated equipment;**
    - **directly from animal to animal** in some cases;
- **Treatment:**
    - It has **no direct antiviral treatment**.
    - Instead, the **infected animals receive supportive care**, which involves the use of antibiotics, painkillers, and wound care sprays to treat symptoms.
    - As there's no treatment, **vaccines are used to control disease transmission.**
- The **disease is of economic importance** as it can **cause a temporary reduction in milk production**, **temporary or permanent sterility in bulls**, damage to hides and, occasionally, death.

Gene variant in people of African origin helps control HIV, says study

CHD1L gene

- The **Chromodomain Helicase DNA Binding Protein 1 Like** (CHD1L), which contains information to make proteins that allow the **body to repair DNA damage.**
- A variant of the CHD1L gene, specifically **present in the African population,** has been linked to the **reduced viral load** (amount of HIV in the blood) of the most common and virulent type of HIV, called HIV-1 (more common and severe retrovirus compared to HIV-2).

- They analysed the DNA of almost 4,000 people of African ancestry living with HIV-1 and found a gene variant CHD1L on chromosome 1.
- People carrying this **variant had a low viral load**. This lowers their risk of spreading the virus and slowing the progress of their own illness.
- The researchers said between 4 per cent and 13 per cent of people of African origin could be carrying this particular variant.

HIV

- **Human immunodeficiency virus** (HIV) is an infection that **attacks the body's immune system.**
- Acquired immunodeficiency syndrome (AIDS) is the most advanced stage of the disease.
- HIV targets the **body's white blood cells, weakening the immune system.**
- This makes it easier to get sick with diseases like tuberculosis, infections and some cancers.
- It is spread from the body fluids of an infected person, including blood, breast milk, semen and vaginal fluids.
- It can be treated and **prevented with antiretroviral therapy** (ART).

Iraq eliminates trachoma as a public health problem

- **Iraq becomes the 50th country** to be acknowledged by the United Nations health agency for eliminating at least one neglected tropical disease globally.

Trachoma

- It is a disease of the eye caused by infection with **the bacterium Chlamydia trachomatis.**
- It is a public health problem in 42 countries, and is responsible for the blindness or visual impairment of about 1.9 million people.
- **Blindness** from **trachoma is irreversible.**
- It is a **neglected tropical disease** and the world's leading infectious cause of blindness.
- **How it spreads?**
    - Infection spreads through personal contact (via hands, clothes, bedding or hard surfaces) and by flies that have been in contact with discharge from the eyes or nose of an infected person.
    - With repeated episodes of infection over many years, the eyelashes may be drawn in so that they rub on the surface of the eye.
    - This causes pain and may permanently **damage the cornea.**
- To eliminate trachoma as a public health problem, **WHO recommends the SAFE strategy**.
- The SAFE strategy includes: **Surgery** to treat the blinding stage (trachomatous trichiasis); **Antibiotics** to clear the infection, particularly the antibiotic azithromycin; **Facial cleanliness** and **Environmental improvement**, particularly improving access to water and sanitation.

- The 17 other countries that have eliminated trachoma are: Benin, Cambodia, China, Gambia, Ghana, Islamic Republic of Iran, Lao People's Democratic Republic, Malawi, Mali, Mexico, Morocco, Myanmar, Nepal, Oman, Saudi Arabia, Togo and Vanuatu.

Study finds genetic causes of Raynaud's phenomenon

Raynaud's Phenomenon

- It is a condition that **causes the blood vessels in the extremities to narrow, restricting blood flow.**
- The episodes or "attacks" **usually affect the fingers and toes.**
- In rare cases, at**tacks occur in other areas such as the ears or nose.**
- An attack **usually happens from exposure to cold or emotional stress.**
- **During a Raynaud's attack, the arterioles and capillaries in your fingers and toes tighten more than they should.**
- **Types of Raynaud's:** This condition is named for the French doctor who first identified it in 1862. You may hear it called by many names. There are two types:
    - **Primary Raynaud's(or Raynaud's disease):**
        - **It happens without any other illness** behind it.
        - The sy**mptoms are often mild.**
    - **Secondary Raynaud's (Raynaud's syndrome, Raynaud's phenomenon):**
        - **It results from another illness.**
        - It's **often a condition that attacks your body's connective tissues**, like lupus or rheumatoid arthritis.
        - It's **less common, but it's more likely to cause serious health problems**. This can include things like skin sores and gangrene. These happen when cells and tissue in your toes and fingers die from lack of blood.
- **In most people, lifestyle changes such as staying warm keep symptoms under control, but in severe cases, repeated attacks lead to skin sores or gangrene** (death and decay of tissue).
- The **treatment depends on how serious the condition is** and whether it is the primary or secondary form.

Did scientists unearth another ancient human lineage in China?

Scientists in China may have found an entirely new lineage of ancient humans after studying fragments of the mandible, skull and leg bones of a fossilised hominid that dates back at least 300,000 years.

- A group of palaeontologists excavated from a site **Hualongdong**, a region in East China.
- The region has revealed an abundance of hominin fossils that dates back to a similar time period. The fossil (mandible and partial cranium) found by the palaeontologists has been labelled ***HLD 6***, the study noted.
- After performing both morphological and geometric analysis, scientists found certain distinctive traits in the jawbone such as a triangular lower edge and a unique bend.
- Both these features are also found in modern humans and other species of hominins such as the Neanderthals and Denisovan during the late Middle Pleistocene epoch.
- The jawbone's unique features exhibited similarities to both modern humans and hominids of the late Middle Pleistocene period. Notably, it lacked a chin, suggesting a closer connection to older species. Additional traits reminiscent of the Middle Pleistocene hominins led the scientists to conclude that the fossil resembles a specimen of the *Homo erectus*.
- This mosaic of traits from different human lineages has led scientists to believe that the specimen possessed a combination of characteristics from both ancient hominids and modern humans.
- This was confirmed further when the scientists examined the skull and found that the facial bones shared greater similarities with those of modern humans as compared to the jawbone.
- As scientists progressed further with their study, they ruled out the possibility of the fossil belonging to the Denisovan lineage. This conclusion suggests that the fossil is perhaps part of another lineage which is distinctively different from Denisovans and the *Homo erectus*, yet closer to *Homo sapiens*.
- The study thus implies that this particular species probably shared close evolutionary relationships with hominin from the Middle to Late Pleistocene which resulted in shared characteristics.

Experts warn against sale of herbicide glyphosate

Glyphosate

- Glyphosate is a **widely used herbicide** that can **kill certain weeds and grasses.** It is **used primarily in agriculture** but also in forestry and lawn and garden care.
- Glyphosate is a **small molecule made of a linear carbon chain with weaker bonds**, which **makes glyphosate less persistent in the environment**. **In India, it goes by various brand names**, including **Roundup, Glycel, and Brake**.
- **Herbicidal Action:**
    - Glyphosate works by **inhibiting an enzyme called EPSP synthase**, which is **essential for the synthesis of certain amino acids that plants need for growth**.
    - By disrupting this enzyme, **glyphosate interferes with the plant's**

ability to produce proteins, leading to the **eventual death of the plant.**

- **Broad-Spectrum:**
  - Glyphosate is considered a **broad-spectrum herbicide**, meaning it can effectively **control a wide variety of plants**, including grasses, broadleaf plants, and woody plants.
  - It is **effective only on plants that grow above the water.** It will **not be effective on plants that are submerged** or have most of their foliage underwater, nor will it control regrowth from seed.
- **Systemic Nature:**
  - Glyphosate is a **systemic herbicide**, which means it **is absorbed by the plant's leaves and then translocated throughout the plant's vascular system.**
  - This **allows it to reach various parts of the plant**, including the roots, leading to effective control of both above-ground and below-ground plant parts.
- Glyphosate is **degraded in soil and water by microbes and binds tightly to soil particles**, which **prevents the leaching** of glyphosate **into groundwater.**
- **Glyphosate does not degrade quickly in plants**. As a result, **it is possible that glyphosate residues can occur in food products.**

What are Legionella bacteria? Know how they forced UK govt remove migrants from Bibby Stockholm barge

- Migrants are removed from the Bibby Stockholm barge after traces of the bacteria causing Legionnaire's disease were found in the onboard water system.

Legionnaire's disease

- It is a **severe form of pneumonia** — lung inflammation usually caused by infection. It's caused by a **bacterium known as legionella.**
- This **bacterium is found in lakes and ponds**, but they can also develop in tanks and other water systems.
- **Transmission:** The most common form of transmission of Legionella is inhalation of contaminated aerosols from contaminated water.
- **Symptoms:** The main symptoms are fever, chills, headache, malaise and muscle pain (myalgia).
- **Treatment:** Treatments exist, but **there is no vaccine currently available** for Legionnaires' disease.

Why our city's bats are most misunderstood

- A new study found that India's largest species of bats, Indian Flying Fox bat spends 7% of its day-roosting time being environmentally vigilant.

- It is a species of flying fox **native to the Indian subcontinent**. It is one of the **largest bats in the world.**
- The nectar and **fruit-eating flying fox (Pteropus giganteus**) is generally considered **vermin** as they raid orchards.
- It is a **keystone species** causing seed dispersals of many plants in tropical systems.
- **Appearance:** The Indian flying fox is so called due to its unique, **fox-like appearance**: reddish-brown coat, characteristically long snout as well as large eyes. And indeed, this animal resembles a little fox with wings.
- **Distribution:** These bats are endemic to South Central Asia, found from Pakistan and China to the Maldives Islands.
- **Habits and Lifestyle:**
    - It is **highly social creatures, forming large roosts** of several hundred animals.
    - These bats live in a 'vertical', male-dominated hierarchy system, where higher-ranked individuals occupy higher spots of the tree, while lower-ranked individuals remain on lower spots.
- **Diet:** They maintain a frugivorous diet, supplementing it with insects as well as flowers, containing juice and nectar.
- **Threat:** Being external roosters, the flying fox is exposed to predators and disturbances apart from environmental indicators such as heat and light.
- **Conservation status**
    - **IUCN:** Least concern
    - **The Wildlife (Protection) Act of 1972:** Schedule II

People with low vitamin K levels have less healthy lungs

Chronic Obstructive Pulmonary Disease (COPD)

- COPD is a **common lung disease** causing **restricted airflow and breathing problems**.
- There are **two main forms of COPD**. Most people with COPD **have a combination of both conditions**.
    - **Chronic bronchitis**, which involves a **long-term cough with mucus.**
    - **Emphysema**, which involves **damage to the lungs over time.**
- **Causes**: It's typically **caused by long-term exposure to irritating gases** or **particulate matter, most often from cigarette smoke.**
- **Signs and symptoms**:
    - The most common symptoms of COPD are **difficulty breathing, chronic cough (sometimes with phlegm) and feeling tired.**
    - COPD symptoms **can get worse quickly.** These are **called flare-ups.** These usually **last for a few days and often require additional medicine**.
    - **People with COPD are at increased risk of developing heart disease**, lung cancer and a **variety of other conditions.**
- **Treatment**:

- **COPD isn't curable**, but it **can get better by not smoking, avoiding air pollution** and getting vaccines.
- It **can be treated with medicines**, oxygen and pulmonary rehabilitation.

Vitamin K

- It is a **fat-soluble vitamin that comes in two forms**.
  - The **main type is called phylloquinone**, **found in green leafy vegetables** like collard greens, kale, and spinach.
  - The **other type, menaquinones, is 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.** 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.

Indian-origin researcher identifies 135 new melanin genes responsible for pigmentation

Melanin

- Melanin is a **substance in your body that produces hair, eye and skin pigmentation**. **It is present** in human and animal skin **to varying degrees,** and is **responsible for your unique eye, hair and skin color.**
- It **also absorbs harmful UV (ultraviolet) rays** and protects your cells from sun damage. Melanin is **produced within special structures called melanosomes**. **Melanosomes are found inside melanin-producing pigment cells called melanocytes**.
- Although all humans have the same number of melanocytes**, the amount of melanin they produce differs and gives **rise to the variation in human skin colour**.
- **People with more melanin generally have darker skin, eyes and hair** compared to those with little melanin.
- **Types of melanin**: There are three different types of melanin, including:
  - **Eumelanin**:
    - Eumelanin is **responsible for dark colors in skin, eyes and hair.** There are **two types of eumelanin: black and brown.**
    - People with brown or black hair have varying amounts of brown and black eumelanin.
    - It **provides protection against UV radiation** by absorbing and dispersing it.
  - **Pheomelanin**:
    - It is responsible for **lighter colors, such as red and yellow.**

        - It is **less effective at protecting against UV radiation** compared to eumelanin.
    - **Neuromelanin**: While eumelanin and pheomelanin control the colors of things you see (such as skin, hair and eyes), **neuromelanin is responsible for the color of your neurons.**

China's Inner Mongolia reports two cases of bubonic plague

Bubonic Plague

- **Plague is an infectious disease caused b**y a specific type of **bacterium called Yersinia pestis.**
- pestis **can affect humans and animals** and is **spread mainly by fleas**.
- **Bubonic plague, also known as Black Death,** is **one type of plague**. It **gets its name from the swollen lymph nodes (buboes) caused by the disease.**
- The **other types of plague are:**
    - **Septicaemic plague**, which **happens when the infection goes all through the body**.
    - **Pneumonic plague**, which happens **when the lungs are infected.**
- **Symptoms**: Bubonic plague symptoms include
    - **Sudden high fever** and chills.
    - **Pains in the areas of the abdomen**, arms and legs.
    - **Headaches**.
    - **Large and swollen lumps in the lymph nodes** (buboes) that develop **and leak pus.**
- **Transmission**:
    - pestis is **spread mostly by fleas on rodents and other animals**.
    - It is **transmitted between animals and humans by the bite of infected fleas**, **direct contact** with infected tissues, and **inhalation of infected respiratory droplets.**
    - It's an **example** of a disease that can spread between animals and people **(a zoonotic disease**).
- **Treatment**:
    - It can be **treated and cured with antibiotics**.
    - **Antibiotics** that treat bubonic plague **include Ciprofloxacin, levofloxacin, moxifloxacin, Gentamicin** and Doxycycline.
    - It **can be fatal if it's not treated.**

Scientists detect 'microplastics' in human heart for first time

Microplastics

- Microplastics are **tiny bits of various types of plastic found in the environment.**

- They are a **result of the fragmentation and degradation of larger plastic** items, **as well as the direct release of tiny plastic particles**, often intentionally added to consumer products like cosmetics and cleaning agents.
- The **name is used to differentiate them from "macroplastics**" such as bottles and bags made of plastic.
- There **is no universal agreement on the size that fits this bill** — the **S. NOAA** (National Oceanic and Atmospheric Administration) **and the European Chemical Agency define microplastic as less than 5mm in length.**

Types of microplastics

- There are two categories of microplastics**: primary and secondary**.
- **Primary microplastics:**
  - They are **tiny particles designed for commercial use**, such as cosmetics, as well as microfibers shed from clothing and other textiles, such as fishing nets.
  - **They enter the environment directly** through any of various channels—for **example, product use, unintentional loss from spills during manufacturing** or transport, **or abrasion during washing.**
- **Secondary microplastics:**
  - They are **particles that result from the breakdown of larger plastic items**, such as water bottles.
  - This typically **happens when larger plastics undergo weathering**, through exposure to, for example, wave action, wind abrasion, and ultraviolet radiation from sunlight.
- **Environmental Impact:**
  - Microplastics are **not biodegradable.**
  - Thus, once in the environment, primary and secondary microplastics **accumulate and persist.**
  - They can be **ingested by marine organisms**, leading to **potential harm to aquatic life and bioaccumulation along the food chain.**
  - They **can also carry toxic chemicals and pollutants**, posing additional risks to organisms and ecosystems.

Meet 'Pibot,' the humanoid robot that can safely pilot an airplane better than a human

Pibot

- It is the **world's first humanoid pilot**.
- It **can fly an aeroplane** just like a human pilot **by manipulating all the single controls in the cockpit**, which is designed for humans.
- **Features**:
  - It combines artificial intelligence and robotics technologies, **can process the natural language of the flight manual** and **control the flight's operation in real-time.**
  - Pibot **can control its arms and fingers to dextrously operate flight**

instruments, even with severe vibration in an aircraft, using high-precision control technology.
    - Its **external cameras allow Pibot to monitor the current state of the aircraft** and the **internal ones help it manage essential switches** on the control panel.
    - It is **capable of memorizing global flight charts** to conduct mistake-free flight missions on any air route.
    - It **can memorise aircraft operation and emergency manuals** (QRH, an in-cockpit manual for the flight crew to refer to in case of in-flight problems) **and respond immediately.**
    - The humanoid robot **can also communicate with air traffic controllers and humans in the cockpit** using voice synthesis, allowing it to act as a pilot or a first officer.

Vitamin D intake 'may reduce cancer mortality in the population by 15%'

Vitamin D

- Vitamin D is a **fat-soluble vitamin** that is essential for the proper functioning of the body.
- **Functions**:
    - It helps **regulate the amount of calcium and phosphate in the body**. These nutrients are **needed to keep bones, teeth and muscles healthy**.
    - It also plays many other important roles in the body, including **regulating inflammation and immune function.**
- There are **different forms of vitamin D**, including ergocalciferol (vitamin D2) and cholecalciferol (vitamin D3).
- **Sources**:
    - **Sunlight Synthesis:** It is **made in the skin when exposed to sunlight**. During periods of sunlight, vitamin D is stored in fat and then released when sunlight is not available.
    - **Dietary Sources:** Vitamin D **can also be obtained from dietary sources**, including **fatty fish** (such as salmon, mackerel, and tuna), **fortified dairy products, fortified cereals,** egg yolks, and certain mushrooms.
- **Deficiency**:
    - Vitamin D deficiency **can lead to weakened bones**, a **condition known as rickets in children and osteomalacia in adults**.
    - It may also **increase the risk of certain chronic diseases**.
    - **People who have limited sun exposure, are elderly, have dark skin, or have specific medical conditions may be at a higher risk of vitamin D deficiency** and may require supplementation.
- **Vitamin D toxicity:**
    - **Getting too much vitamin D** (known as vitamin D toxicity) **can be harmful.**

- **Sign**s of toxicity **include nausea and vomiting, poor appetite, constipation,** weakness, and weight loss.
- It can **lead to toxic levels of calcium in the blood**, **causing a condition known as hypercalcemia.**
- Very high levels of vitamin D **can damage the kidneys.**

Scientists discover new salamander species in the mountain lakes of Manipur

Tylototriton zaimeng

- This had **earlier been mistaken for its close relatives** — the T. himalayanus and the T. verrucosus.
- Phylogenetic analysis revealed that the new salamander **is a sister species of the T. panwaensis and T. houi** found in northern Myanmar and southern China,
- **Appearance:**
  - It was found to be a **medium-sized salamander.**
  - Its **head is massive and wide**, with a rounded snout and protruding supratemporal bony ridges, while a well-developed sagittal ridge adorns its crown.
  - The creature's limbs, short and elegantly formed, did not overlap when adpressed along its body.
  - A wide and **unsegmented vertebral ridge ran along its back**, accompanied by 13-14 pairs of rib nodules, marking a clear distinction from its kin.
  - It displayed a stunning brown colouration, embellished with dull orange to yellowish-brown markings on its head, vertebral ridge, rib nodules, palms, soles, vent, and ventral tail ridge. Vomerine teeth, elegantly organized in two distinctly curved bell-shaped series, further differentiated this mysterious creature.

Zaimeng Lake

- It is situated on top of **Khongtheng mountain ranges.**
- Zaimeng in the Liangmai Naga dialect means "puzzle" or "mystery".
- The greater part of the lake is **basically a marshy mass of thick grass like weeds**, mixed with reeds and green mosses.
- The estimated height of this lake is 2176 metres above sea level.

Bunch of new Placenta in chip devices can help making pregnancies safe

Placenta on chip

- A bunch of devices mimicking the placenta at various **stages of pregnancy can help in drug discovery, study of toxicity of chemicals like caffeine**,

and understanding the effects of conditions such as preeclampsia and diabetes mellitus during pregnancy.

- In pregnancy, the placenta shields the baby from harmful drugs and chemicals. But some can still cross this barrier and cause harm to the baby in the womb.
- Thus, pregnant women are not given most medications and they continue to suffer. Determining which medicines can be given during pregnancy that would not cross the placenta is a daunting task.
- Researchers **have used microfluidic technology which can integrate processes**, to create an environment that represents basic organ structure and functions of the placenta.
- The placenta in a lab dish developed by the team **allows different cells to interact with each other, incorporate mechanical properties** and mimic the blood flow, which closely resembles the in-vivo condition.
- Among various available POC models, these devices are more suitable for probing placental development as well as diseases caused due to defects in the placenta. Also, patient-specific sample screening will be possible for personalised medicine.

Advantage of placenta-on-chip

- It will **enable early detection of adverse conditions** and allows researchers and healthcare professionals to observe, study, and identify potential issues that may arise during pregnancy.
- It enables the **study of placental function, detection of complications**, personalized medicine, and the development of new therapies.

In a warmer, wetter world, pests are multiplying faster and damaging crops severely

In April, tea planters from southern India sought urgent government intervention, saying that the tea mosquito bug is causing havoc in the most unlikely places. The bug, recognised as a serious pest of fruits and tea plantations across the world, is usually confined to low elevation areas.

The extent of damage can be seen in Tamil Nadu's Valparai hills, where tea production has declined by 50 per cent

- *Helopeltis theivora*, the most predominant tea mosquito bug species in India, is spreading in an alarming form in tea plantations of Tamil Nadu's Anaimalai and Valparai hills. Sikkim has recorded the first infestation of *H theivora* in red cherry pepper
- *H bradyi*, which has so far been restricted to Peninsular India, was reported for the first time on the high altitude Tura region of Meghalaya. *H antonii*, which causes damage to cashew crops, is now being reported in Gujarat, Chhattisgarh and Odisha, the authors note.
- In Rajasthan's Alwar district, *Tidda* (leafhoppers) and silverleaf whitefly

(*Bemisia tabaci*) are not new to Ramgarh village, where farmers primarily grow wheat, millets, mustard, vegetables and pulses. But they have become more menacing in recent years.

- *Impacts of Climate Change*, the scientists write that in India, such warming is likely to result in pest attacks on staple crops such as cotton, wheat, barley, oats, rice, pulse crops, maize, sorghum, oilseed and vegetables, on which a majority of the population relies for daily nutrition.
- In a warming world, changes in both temperature and rainfall are the two big drivers of shifts in how and where pests and diseases spread. This trend will be exacerbated by increasing concentration of carbon dioxide in the atmosphere.

Warming, a multiplier

The impact of warming will profoundly affect aphids—soft-bodied insects that suck into plant saps to deform leaves and flowers. About 250 aphid species are recognised as crops pests for agriculture, as they can affect multiple crops of different plant families.

They also known to transmit plant viruses. Aphids are found across the world and have the ability to migrate up to 1,300 km, typically during spring and autumn seasons. Since they are sensitive to changes in ambient temperatures, this will translate to changes in their lifecycle.

Oldest surviving plant species saw dinosaurs come and go, humans threaten it

Takakia

- It is a **rare genus of moss that** adapted over millions of years to life at high altitudes.
- **Appearance:** When seen from a distance, it looks like a later of moss or green algae on the rocks where it grows. But closer inspection would reveal slender turf around one centimetre in length with an arrangement of short, finger-like leaves.
- It is a genus that only has two species **(lepidozioides and T. ceratophylla)** and both of them are found together only in the Tibetan Plateau.
- It has developed the **ability to survive frost, life-threatening UV radiation** and other hazardous conditions.
- It combines features found in **mosses, liverworts and green algae.**
- It is a moss that separated from other mosses 390 million years ago, not long after the first land plants evolved.

Moss

- It is a small **nonvascular spore-bearing land plants**.
- Mosses are **distributed throughout the world except in salt water** and are commonly found in moist shady locations.

- Ecologically, mosses **break down exposed substrata**, releasing nutrients for the use of more-complex plants that succeed them.
- They **also aid in soil erosion control by providing surface cover** and absorbing water, and they are important in the nutrient and water economy of some vegetation types.

India committed to eliminate Lymphatic Filariasis by 2027

Lymphatic Filariasis

- Lymphatic filariasis, **commonly known as elephantiasis, is a neglected tropical disease.**
- **Infection occurs when filarial parasites are transmitted to humans through mosquitoes**. This **impairs the lymphatic system** and can **lead to the abnormal enlargement of body parts**, causing pain, severe disability and social stigma.
- **Cause**: It s **caused by infection with parasites classified as nematodes** (roundworms) of the family Filariodidea. There are **3 types of these thread-like filarial worms**:
    - **Wuchereria bancrofti,** which is **responsible for 90% of the cases.**
    - **Brugia malayi**, which causes **most of the remainder of the cases.**
    - **Brugia timori**, which **also causes the disease.**
- **Adult worms nest in the lymphatic vessels** and di**srupt the normal function of the lymphatic system**. The worms can **live for approximately 6–8 years** and, during their lifetime, **produce millions of microfilariae (**immature larvae) **that circulate in the blood.**
- **Transmission**: **Mosquitoes are infected with microfilariae by ingesting blood** when biting an infected host. **Microfilariae mature into infective larvae within the mosquito**. **When infected mosquitoes bite people**, **mature parasite larvae are deposited** on the skin, from where they can enter the body.
- **Symptoms**: About **two in every three people** who have lymphatic filariasis **don't have severe symptoms**. But filariasis **usually leads to a weakened immune system**. **Some people may experience:**
    - **Inflammation**: An overactivated immune system.
    - **Lymphedema**: Fluid buildup in your lymphatic system.
    - **Hydrocele**: Swelling and fluid buildup in the scrotum.
    - **Edema**: Swelling and fluid buildup in your arms, legs, breasts and female genitals (vulva).
- **Treatment**:
    - Elimination of lymphatic filariasis is **possible by stopping the spread of the infection through preventive chemotherapy.**
    - The **WHO-recommended preventive chemotherapy strategy for lymphatic filariasis elimination is mass drug administration (MDA).**
    - MDA involves **administering an annual dose of medicines to the**

entire at-risk population.
    - The medicines used have a limited effect on adult parasites but **effectively reduce the density of microfilariae in the bloodstream** and prevent the spread of parasites to mosquitoes.

Global Initiatives to Eradicate Lymphatic Filariasis:

- **WHO's road map 2021–2030: Sets global targets and milestones to prevent, control**, eliminate or **eradicate 20 diseases.**
- **Global Programme to Eliminate Lymphatic Filariasis (GPELF): WHO established** this to **stop the transmission of infection by mass drug administration (MDA) of anthelmintics** and to alleviate the suffering of people affected by the disease through morbidity management and disability prevention (MMDP).

In a first in India, Goa to give free IVF treatment in govt hospital

In Vitro Fertilization (IVF)

- It is a **medical procedure used to assist individuals** or couples who are **facing fertility challenges in achieving pregnancy.**
- IVF is the **most common and effective type of assisted reproductive technology (ART).**
- **Process:**
    - IVF is a complex process that **involves retrieving eggs from ovaries** and **manually combining them with sperm in a lab for fertilization**.
    - Several days after fertilization, the **fertilized egg (now called an embryo) is placed inside a uterus.**
    - **Pregnancy occurs when this embryo implants itself into the uterine wall**.
- The procedure can be **done using a couple's own eggs and sperm**. Or IVF **may involve eggs, sperm or embryos from a known or anonymous donor**.
- **The success rate** of IVF **depends on a number of factors** including reproductive history, maternal age, the cause of infertility, and lifestyle factors.
- IVF can be **used to treat infertility in the following patients:**
    - Blocked or **damaged fallopian tubes**;
    - **Male factor infertility** including **decreased sperm count** or sperm motility;
    - **Women with ovulation disorders**, premature ovarian failure, uterine fibroids;
    - **Women who have had their fallopian tubes removed**;
    - Individuals with a **genetic disorder**;
    - **Unexplained infertility;**

MeitY Secretary Alkesh Kumar Sharma Launches the Graphene-Aurora Program

Graphene-Aurora Program

- The program shall be implemented by **Digital University Kerala** with joint funding from **Ministry of Electronics & Information Technology** (MeitY), and Government of Kerala and Industry partners, **Carborundum Pvt Limited** joined as one of the main industry partners.
- It shall nurture the **deep/emerging Graphene technology & innovation ecosystem** that can guide, develop, implement, and support SMEs and startups to commercialize developed graphene technologies for scale adoption.
- Creation of a commercialization eco-system for graphene as an emerging technology would help India take a pole position in the world's new material market.

Graphene

- Graphene is a material that is **extracted from graphite and is made up of pure carbon.**
- It is one of the most important elements in nature which we find in daily objects like the lead of a pencil.
- It is the world's **thinnest, strongest, and most conductive material** of both electricity and heat.
- It conducts electricity better than copper.
- It is 200 times stronger than steel but six times lighter.
- It is almost **perfectly transparent as it absorbs only 2% of light**.
- It is impermeable to gases, even those as light as hydrogen and helium.

Platelets 'can replicate benefits of exercise in brain', shows study

- Scientists have found that an injection of specific blood molecules can replicate the benefits of exercise in the brain, paving the way for potential new treatments for age-related cognitive decline in Alzheimer's disease patients.
- The platelets, the tiny blood cells critical for blood clotting, secrete a protein that rejuvenates neurons in aged mice in a similar way to physical exercise.
- We know exercise increases the production of new neurons in the **hippocampus**, the part of the brain important for learning and memory,
- Previous research has shown platelets are involved, but this study shows platelets are actually required for this effect in the aged mice.

- The study focused on **exerkines**, the biological compounds released into the bloodstream during exercise, which are believed to stimulate the exercise-induced response in the brain.
- We discovered that the exerkine CXCL4/Platelet factor 4 or PF4, which is released from platelets after exercise, results in regenerative and cognitive improvements when injected into aged mice
- The findings have significant implications for the development of drug interventions.

Pink Floyd song reconstructed from listeners' brain activity: How was this done, significance

- A new study has made inroads in this research by successfully managing to "decode" the brain's electrical activity to reconstitute it as recognisable music.
- This is not the first time scientists have managed to reconstruct what the brain perceives from recorded neural signals. In the past, there have been successful attempts at recreating words and images using signals recorded by implanted electrodes.
- However, this is the first time scientists have managed to reconstruct a recognisable, even if somewhat garbled, song purely from neural recordings.
- The results of this study might help create better brain-computer interfaces and assistive devices that translate brainwaves into speech for those unable to speak due to paralysis caused by stroke.
- Consider the late Stephen Hawking, one of the world's most famous scientists who lost his ability to speak due to a motor-neurone disease which left him paralysed. After he was unable to speak, he communicated via a speech generating device which improved over the years. But even at its very best, the speech generated was robotic, without any inflection.

Electrodes implanted onto the brain's surface

- The 29 test subjects were all suffering from epilepsy and already had implants inserted onto their brains to determine the cause of the seizures. The researchers were able to get consent from these patients to carry out this study.
- Moreover, even after placing electrodes directly on to the brain, the music was still somewhat garbled due to the number of electrodes that were packed in. The researchers hope that by increasing the density of electrodes on the brain (number of electrodes/surface area), they will be able to obtain even better resolution.

Focus on auditory regions for reproducing speech

- Despite these limitations on its current real-world applicability, scientists have gathered some vital information during this exercise.
- Crucially, researchers were able to identify which parts of the brain respond to which kind of stimuli. They found that certain portions of **superior**

temporal gyrus – located just behind and above the ear and associated with auditory processing – respond to the onset of speech, while other areas respond to other elements of the music.

- In the past, researchers have focused on the **brain's motor cortex**, associated with movements of the mouth and vocal cords to recreate the acoustics of speech. The new study can guide scientists to a different location.

Amylotropic Lateral Sclerosis:

- It is a **neurodegenerative disease** in which special nerve cells **called motor neurons** in the brain and spine which control an individual's voluntary functions like walking, chewing, talking, **moving their arms- are affected.**
- It's also known as **Lou Gehrig's disease.**
- As these nerve cells **progressively die,** the muscles dependent on them are unable to function or move, due to which they **begin to atrophy or waste away.**

How does ALS affect the body?

- As your motor neurons (nerve cells) continue to decline, they can't send signals to your muscles. The two types of motor neurons are:
    - **Upper motor neurons**, the motor nerve cells in your brain and spinal cord. Their job is to **send signals to lower motor neurons**.
    - **Lower motor neurons**, the motor nerve cells in your brain stem (lower part of your brain) and spinal cord. They receive instructions from the upper motor neurons. They then send messages to your muscles telling them to move.
- From the onset of symptoms, it takes around 8 to 15 months for diagnosis.
- Currently, there is **no effective cure** for this disease.

What is Leidenfrost effect?

If you watch cooking videos on social media frequently, chances are that you may have come across tutorials to treat your stainless-steel cooking utensils to imitate the behaviour of their non-stick counterparts.

- While this step is often called the "water test" in such videos, the driving principle here is the Leidenfrost effect.
- The Leidenfrost effect is a phenomenon where the bottom layer of a liquid, when added to a surface that is hotter than its boiling point, instantly vaporises and forms an insulating layer around the rest of the liquid, protecting it from boiling rapidly. The vapour layer is extremely thin but enough to keep the liquid just below its boiling point since it decreases the heat transfer from the surface to the liquid.
- When water is added to a sufficiently hot metal pan, it scuttles around instead of immediately evaporating, even though the temperature of the pan is much higher than the boiling point of water. Since the thermal conductivity of

steam is much lower than the metal pan, water in this case evaporates slower than it otherwise would. This is an everyday depiction of the Leidenfrost effect.
- The temperature of the pan has to be at or above the Leidenfrost point – which corresponds to the minimal heat flux or the lowest amount of heat that can be transferred from the hotter to the colder body in consideration – for this effect to come into play.
- If the heat flux drops below the Leidenfrost point, the vapour layer will collapse.

Who is the phenomenon named after?

Johann Gottlob Leidenfrost was a German doctor who is credited with having first described the Leidenfrost effect.

Gene-edited mustard: Less pungent, more useful

Oilseeds yield not only oil for cooking and frying. Their so-called meal – the residual cake after extraction of oil from the seeds – is a protein-rich ingredient used in livestock, poultry and aqua feed.

- Mustard seeds have high levels of **glucosinolates**, a group of sulphur and nitrogen-containing compounds contributing to the characteristic pungency of their oil and meal.
- While that limits the oil's acceptability among consumers – especially those preferring cooking medium having less strong flavour and odour – the problem is even more with the meal.
- Rapeseed meal is unpalatable to poultry and pigs, while having to be mixed with fodder grass and water for giving to cattle and buffaloes.
- Besides reducing their feed intake, high glucosinolates are also known to cause goiter (swelling of neck) and internal organ abnormalities in livestock.

Breeding for Canola-quality mustard

- By lowering the glucosinolate content to the same dry seed weight concentration, the scientists have bred mustard lines whose oil and meal match the standard of canola-quality rapeseed (*Brassica napus*) in terms of pungency.
- However, large-scale cultivation of these canola-quality low-glucosinolate mustard lines hasn't taken place, a major reason being their vulnerability to pests and diseases. The same glucosinolates that limit the palatability of the meal and the exploitation of its true protein potential are also key arsenals of the *Brassicaceae* family crops – from mustard and canola to cabbage, cauliflower and broccoli – against invading pests, pathogens and termites.
- While the lowering of glucosinolate levels in seed is desirable for oil and meal,

a concomitant reduction in the whole plant weakens its defence. The protection provided by glucosinolates to the plant should not be compromised

Gene-edited Mustard:

- India's most significant domestically-grown oilseed is **rapeseed-mustard.**
- **Issues with Mustard seeds**
    - Mustard seeds have high **levels of glucosinolates,** a **group of sulphur and nitrogen-containing compounds** contributing to the characteristic pungency of their oil and meal.
    - Rapeseed meal is **unpalatable to poultry and pigs**, while having to be mixed with fodder grass and water for giving to cattle and buffaloes.
    - Besides reducing their feed intake, high glucosinolates are also known to cause **goiter (swelling of neck) and internal organ abnormalities in livestock.**
    - The dry seeds from the normal mustard (Brassica juncea) cultivated in India **contain 120-130 parts per million** (ppm or mg/kg) of glucosinolates. This is as against the sub-30 ppm levels in canola seeds.

A Gene Editing breakthrough

- The **Glucosinolates** are synthesised in the **leaves and pod walls of mustard plants**.
- Their translocation and accumulation in the seeds happens through the action of **glucosinolate transporter or GTR genes**.
- There are 12 such genes under two distinct classes of GTR1 and GTR2 with six copies each.
- Researchers **edited 10 out of the 12 GTR genes in 'Varuna'**, a high-yielding Indian mustard variety.
- For this, **they used CRISPR/Cas9 – a gene-editing tool deploying an enzyme**, which acts as a "molecular scissors" to cut the DNA at precise targeted locations of the gene, and then letting the natural DNA repair process to take over.
- By doing this, **their encoded proteins**, responsible for transport of the glucosinolates to the seeds, were rendered non-functional.
- By lowering the glucosinolate content to the same dry seed weight concentration, the scientists have bred mustard lines whose oil and meal **match the standard of canola-quality rapeseed (Brassica napus) in terms of pungency.**
- The new GTR genes-edited mustard lines are **transgene-free or non-genetically modified (GM).**
- They contain no foreign genes like those of the Bacillus thuringiensis bacteria in cotton or Bar-Barnase-Barstar (isolated from other soil bacteria) in the GM hybrid mustard (DMH-11).

What are Acoustic Side Channel Attacks and how is AI used to increase its

accuracy?

Acoustic Side Channel Attack

- This technique uses the **sounds produced by typing on a keyboard** to determine what keys are being pressed.
- By analysing these unique sounds, **hackers equipped with the right tools can decode** the precise letters and numbers being typed.
- Researchers investigated the use of audio recordings taken **from Zoom video conferencing calls, smartphone microphones,** and off-the-shelf equipment and algorithms to launch ASCA attacks.
- The study found that when trained on keystrokes by a nearby phone, the classifier **achieved an accuracy of 95%,** the highest accuracy seen without the use of a language model.
- **Accuracy**
    - When a deep learning model was **trained on the data with default values**, the model was able to acquire a **meaningful interpretation of the data**.
    - On a MacBook Pro, which features a keyboard identical in switch design to Apple's models from the last two years, the model **was able to achieve state-of-the-art accuracy** with minimal training data.
    - Additionally, when **the AI model** was made to recognise keystrokes using audio captured through a smartphone microphone, it was able to **achieve 95% accuracy.**
- **Implications**
    - This form of hacking **could expose sensitive information** like passwords and personal messages.

Side Channel Attacks (SCAs)

- These are a method of **hacking a cryptographic algorithm** based on the analysis of auxiliary systems used in the encryption method.
- These can be performed using a collection of signals emitted by devices, including **electromagnetic waves, power consumption, mobile sensors** as well as sound from keyboards and printers to target devices.
- Once collected, these signals are used to interpret signals that can be then used to **compromise the security of a device.**

Now, a bacteria that can eat methane. Can it reduce global warming?

A strain of bacteria could potentially remove methane from major emission sites such as landfills, paddy fields, and oil and gas wells, according to a new study.

- The bacterial strain *Methylotuvimicrobium buryatense* 5GB1C consumes methane, which is over 85 times more potent than carbon dioxide (CO_2) on a 20-year timescale. It is responsible for nearly 30 per cent of the total global warming.

- Methane-eating bacteria (methanotrophs) can be an attractive option. But they grow best when the methane concentration is around 5,000-10,000 parts per million (ppm).
- However, methane levels in key emission sites are around 500 ppm. So the researchers screened a range of existing methanotrophs to identify those that consume such low methane (500 ppm) at significantly higher rates.
- They found that *Methylotuvimicrobium buryatense* 5GB1C performed the best at 500 ppm. Further tests also showed that this strain grew well even at 200 ppm.
- It can grow at low methane concentrations ranging from 200-1,000 ppm. "These features make this strain a promising candidate for methane removal technology," the researchers explained.
- Bacteria produce biomass after consuming methane. This biomass can be used as feed in aquaculture.
- For every tonne of methane consumed, the bacteria can generate 0.78 tonne biomass dry-weight methane. It has a value of roughly $1,600 per tonne, the study found..
- They also recommend making genetic changes to the bacterial strain. This can be done by inducing gene mutations and choosing strains with desired characteristics.
- By incorporating these changes, nations across the globe can prevent 240 million tonnes of methane from major emission sites from entering the atmosphere by deploying 50,000-300,000 treatment units for 20 years.
- Researchers expect a few challenges if the technology is scaled up. For instance, controlling temperature is tricky. As the optimal temperature range is 25-30oC, both too-low and too-high temperatures become problematic for bacterial growth, the researchers noted.

Alcanivorax borkumensis Biofilms Enhance Oil Degradation By Interfacial Tubulation

Alcanivorax borkumensis

- It is a marine bacterium that uses **exclusively petroleum oil hydrocarbons** as sources of carbon and energy (and is therefore designated "hydrocarbonoclastic").
- It is found in low numbers in all oceans of the world and **becomes abundant in oil-contaminated waters.**
- It may now serve as a model organism to understand bacterial alkane metabolism.
- It is a **rod-shaped bacterium** without flagella that obtains its energy primarily from eating alkanes (a type of hydrocarbon).
- It is **aerobic**, meaning it uses oxygen to gain energy.
- It is **halophilic**, meaning it tends to form in environments that contain salt, such as salty ocean water.
- It also can flourish **in areas with heavy tides** and other sea-related currents.

- It is found only on or near the surface of the water.
- It can live in salinities ranging from 1-12.5% and in temperatures ranging from 4-35°C.
- Its ubiquity, unusual physiology and demonstrated role in biodegradation show that it is globally important in the removal of hydrocarbons from polluted marine systems.

FDA approves first vaccine to protect newborns from RSV

Respiratory Syncytial Virus (RSV)

- It is a common **respiratory virus.**
- RSV is one of the most frequent causes of **childhood illness.**
- It usually causes mild, cold-like symptoms.
- Premature infants, babies younger than 6 months old, people over age 65, and people who have a compromised immune system, chronic lung disease, or congenital heart condition can get a more severe case of RSV.
- A severe infection leads to **pneumonia and bronchiolitis.**
- **Transmission:** RSV spreads from person to person through-
    - The air by coughing and sneezing;
    - Direct contact, such as kissing the face of a child who has RSV;
    - Touching an object or surface with the virus on it, then touching your mouth, nose, or eyes before washing your hands;
- People who have an RSV infection are usually contagious for 3 to 8 days. But sometimes infants and people with weakened immune systems can continue to spread the virus for as long as 4 weeks.
- **Symptoms**: The symptoms of RSV infection usually start about 4 to 6 days after infection. They include-
    - Runny nose,
    - Decrease in appetite,
    - Cough,
    - Sneezing,
    - Fever,
    - Wheezing,
    - RSV can **also cause more severe infections**, especially in people at high risk. These infections **include bronchiolitis, an inflammation of the small airways** in the lung, and **pneumonia, an infection of the lungs.**

India has started manufacturing 38 APIs in past 1.5 years

Active Pharmaceutical Ingredients (APIs)

- APIs are the **active components in a pharmaceutical drug that produces the required effect** on the body to treat a condition.

- APIs are **produced by processing chemical compounds**.
- In a biologic drug, the **active ingredient is known as a bulk process intermediate (BPI).**
- In the context of drug development and manufacturing, **APIs are the key active components that interact with specific receptors or target molecules** in the body to bring about the desired physiological or therapeutic response
- All **drugs are made up of two core components**: (1) **Active Pharmaceutical Ingredient** (API), which is the central ingredient, **and (2) excipients.**
- **Excipients**:
    - They are substances other than the drug that **helps deliver the medication to your system.**
    - Excipients are **chemically inactive substances**, such as lactose or mineral oil.
    - Some of these materials are **used to help the medication remain stable and to control absorption** when you take the drug.
- **Example**: For instance, if you have a headache**, acetaminophen is the API, while the liquid in the gel-capsule or the bulk of a pill is the excipient.**

Inflammatory bowel disease (IBD) in rural and urban India

Inflammatory Bowel Disease (IBD)

- It is a **group of chronic inflammatory conditions** that **affect the gastrointestinal (GI) tract.**
- These conditions **cause inflammation and damage to the lining of the digestive tract**, leading to various symptoms and complications.
- The **two main types of IBD are Crohn's disease and ulcerative colitis.**
- **Crohn's disease:**
    - It can **affect any part of the GI tract**, from the mouth to the anus, but **most commonly involves the end of the small intestine** (ileum) **and the beginning of the large intestine** (colon).
    - The inflammation in Crohn's disease **can extend deep into the layers of the bowel tissue** and **may involve skip lesions** (affected areas separated by healthy ones).
- **Ulcerative colitis:**
    - This type of IBD **affects the large intestine (**colon) **and the rectum.**
    - **The inflammation** in ulcerative colitis **usually begins in the rectum** and spreads continuously up the colon in a continuous pattern.
    - **The inner lining of the colon becomes inflamed**, leading to the **formation of ulcers.**
- **Symptoms**: It can vary in severity and may include:
    - **Abdominal pain** and cramping
    - **Diarrhea** (which can be bloody in ulcerative colitis)
    - **Weight loss** and loss of appetite
    - **Fatigue**

  - Fever
  - **Rectal bleeding** (common in ulcerative colitis)
  - Joint pain and inflammation
  - Skin problems
- **Cause**: The **exact cause of IBD is unknown**, but IBD is the result of a weakened immune system. **Possible causes are:**
  - The **immune system responds incorrectly to environmental triggers**, such as a virus or bacteria, **which causes inflammation of the gastrointestinal tract**.
  - There **also appears to be a genetic component**. Someone with a family history of IBD is more likely to develop this inappropriate immune response.
- **Treatment**:
  - Although there is **no curative treatment for IBD**, it's possible to **reduce inflammation and address symptoms with a variety of therapies**.
  - The **goals of treating IBD include stopping future flare-ups** and healing inflammation in the intestines, both in the lining and on a deep cellular level.
  - **IBD treatments may include medications, surgery and a range of diet and lifestyle changes** that help reduce inflammation and support the immune system.

Introducing SeamlessM4T, a Multimodal AI Model for Speech and Text Translations

SeamlessM4T

- SeamlessM4T, which stands for Massively Multilingual and Multimodal Machine Translation, is an advanced multilingual multimodal AI translation and transcription model.
- It was developed by **Meta,** the technology company formerly known as Facebook.
- SeamlessM4T is capable of performing various tasks including speech-to-text, speech-to-speech, text-to-speech, and text-to-text translations.
- **SeamlessM4T supports:**
  - Speech recognition for nearly 100 languages;
  - Speech-to-text translation for nearly 100 input and output languages;
  - Speech-to-speech translation, supporting nearly 100 input languages and 36 (including English) output languages;
  - Text-to-text translation for nearly 100 languages;
  - Text-to-speech translation, supporting nearly 100 input languages and 35 (including English) output languages;
- **Other Features:**
  - SeamlessM4T brings together diverse spoken data sources to provide a comprehensive multilingual and multimodal translation experience

from a single model.
- It performs the entire translation task in one go, unlike other large translation models that divide translation across different systems.
- It has the ability to recognise when a speaker is code-switching or when someone moves between two or more languages in one sentence.
- It also recognises gender bias in languages, and the model can quantify gender bias in translations.

Researchers unveil 'demon particle' that can lead to making superconductors

Demon Particle

- The demon particle was first predicted by theoretical physicist **David Pines** in 1956.
- Pines theorised that electrons passing through a solid would exhibit unique behaviours and that these behaviours could lead to the formation of a new type of particle that he called a "demon particle."
- They are massless, chargeless, and transparent to light.
- They are also able to form plasmons, which are collective units of electrons that behave like waves.
- Plasmons are important in superconductivity, and the discovery of demon particles could lead to the development of new superconducting materials that operate at room temperature.

Superconductivity

- It is a phenomenon whereby a charge moves through a material without resistance.
- In theory, this allows electrical energy to be transferred between two points with perfect efficiency, losing nothing to heat.
- It was first discovered in **1911** by Dutch physicist Heike Kamerlingh Onnes when he observed the sudden drop in electrical resistance of mercury at extremely low temperatures.
- Superconductivity is generally observed at very low temperatures, often close to **absolute zero** (0 Kelvin or -273.15°C).
- **Meissner-Ochsenfeld Effect:**
  - Superconductors expel magnetic fields from their interior when they enter the superconducting state.
  - This effect, known as the Meissner-Ochsenfeld effect, causes the superconductor to repel magnetic fields, leading to the phenomenon of magnetic levitation.
  - When a magnet is brought near a superconductor in its superconducting state, it will float above the superconductor due to this repulsion.

1 dead in Alabama from rare, mosquito-borne virus

Eastern Equine Encephalitis (EEE) Virus

- It is an **extremely rare but serious and often fatal infection** that c**auses encephalitis or inflammation of the brain.**
- EEE **got its name because researchers first discovered the virus in horses (equines)** in the 1830s.
- The virus can **affect how your brain and nerves function.**
- It is s**pread by the bite of a mosquito infected with EEE vir**us (EEEV).
- It **can also infect a wide range of animals,** including mammals, birds, reptiles, and amphibians.
- **Fatality Rate: About 30%** of people bitten by an EEE-infected mosquito develop encephalitis and die from the infection.
- **Is EEE contagious?**
    - **It is not contagious.** The virus c**an only spread to humans through an infected mosquito bite**.
    - It **can't spread from human to human** or from horses (or other animals) to humans.
- **Symptoms:**
    - EEEV infections in humans can **vary in severity. Many people** infected with the virus **do not develop any symptoms** (asymptomatic).
    - **However, when symptoms do occur,** they can **include fever, headache, vomiting, diarrhoea, and various neurological symptoms such as encephalitis** (inflammation of the brain), which **can lead to seizures, coma, and, in some cases, death.**
    - Severe cases are more common in infants and the elderly.
- **Treatment**:
    - There is n**o human vaccine** for EEE o**r anti-viral drugs** for the treatment of EEE.
    - **Supportive care is provided to manage symptoms,** especially in severe cases.

Start-up AR4 Tech, Sodion tie up to make sodium ion battery packs

Sodium-Ion Battery

- These types of batteries **generate electricity through a chemical reaction**.
- These are made up of an anode, cathode, separator and electrolyte.
- In a sodium-ion battery, **lithium ions** are **replaced with sodium ions** in the battery's cathode, and lithium salts are swapped for sodium salts in the electrolyte.
- **Operating principle:**
    - When the battery is being charged, **Na atoms in the cathode release electrons to the external circuit** and become ions, which migrate through the electrolyte toward the anode, where they combine with

electrons from the external circuit while reacting with the layered anode material.
    - This process is reversed during discharge.
- **Benefits of sodium batteries**
    - **Readily available**: One of the most interesting aspects of this technology is the wide availability in nature of its constituent raw materials.
    - **Safety:** Sodium batteries also ensure high standards of safety because cells based on this **chemical element are neither flammable nor susceptible** to explosions or short circuits
    - **Low-cost:** The raw materials are readily available in nature and can be extracted at low costs and with low energy use, making sodium a material with a low impact on the environment.
    - Low-temperature resistance

This common herbicide affects male reproductive health

Clethodim

- It is an **oxime O-ether** resulting from the formal conversion of the acyclic keto group of oxime with the chloroallyl group.
- It is **used as an herbicide** that is used to control annual and perennial grasses.
- It is **highly soluble in water** and has a low volatility.
- It tends not to be persistent in soil or aquatic systems.
- It is moderately toxic to birds, fish, aquatic plants, honeybees and earthworms but is less toxic to aquatic invertebrates and algae.
- It is moderately toxic to mammals, and while it is a skin irritant, no evidence of it causing more serious health effects has been found.
- **Effects on human health**
    - Exposure to this herbicide will impact **male reproductive function** and early embryonic development.
    - Also, it causes a reduction in testicular weight, a decrease in germ cell population, lower levels of serum testosterone, abnormalities in sperm, and compromised pre-implantation embryo development.

C-DOT's 40th Foundation day: Communication Minister Launched Security systems

C-DOT's TRINETRA

- It is a combination of multiple Security systems like Security Information and Event Management (SIEM), Security Orchestration and Automated Response (SOAR), Data Loss Prevention (DLP), User Entity and Behaviour Analytics (UEBA), Multi-Source Threat Intelligence and others.

- The solution provides 24x7 near real-time actionable cyber-security status and detection and resolution of cyber-threats (Virus, Malware, Ransomware, Spyware, etc.).
- It also performs security evaluation of the organisation's IT assets by protecting endpoints, including PCs, laptops, Servers and VMs, by detection, analyses and mitigation of vulnerabilities and giving AI-enabled automated responses to cyber threats, ensuring the protection of sensitive data.
- The solution is capable of protecting the critical digital infrastructure of various Government departments from the ever-evolving cyber threat landscape.

C-DOT

- It was established in 1984 as an autonomous Telecom R&D centre of the Department of Telecommunications, Ministry of Communications, Government of India.
- It is a registered society under the Societies Registration Act, 1860.
- It is a registered 'public funded research institution' with the Department of Scientific and Industrial Research (DSIR), Ministry of Science & Technology, Government of India.
- Headquarters: New Delhi.

DEFENCE & SPACE

Indonesia buys 12 drones worth $300 million from Turkey

The Indonesian government bought 12 drones worth $300 million from Turkish Aerospace to strengthen Indonesia's defence system, according to a written statement from the Indonesian Defense Ministry on August 2

Anka drone, a medium-altitude long-endurance (MALE) class unmanned aerial vehicle (UAV) manufactured by a pioneering Turkish defense industry company

The first model of the Anka UAV had its maiden flight in 2010.

The TUAV system, which is designed for night and day missions including adverse weather conditions, performs real-time image intelligence, surveillance, reconnaissance, moving/stationary target detection, recognition, identification, and tracking missions.

While the TUAV system has an open architecture to support other payloads and missions, the air vehicle is typically configured to carry the following payloads:

- Electro-optic color day camera (EO day TV)
- Electro-optic/forward-looking infrared/laser rangefinder/laser designator and spotter camera (EO/FLIR/LRF/LDS)
- Synthetic-aperture radar/ground moving target indicator (SAR/GMTI)
- Inverse synthetic-aperture radar (ISAR)

Based in Ankara, the TAI manufactures unmanned aerial vehicles, aircraft, helicopters and satellites and their components.

TAI was established in June 1973 to reduce Türkiye's dependency on foreign suppliers.

INDO - US JOINT TRAINING EXERCISE "YUDH ABHYAS 2022" TO COMMENCE IN UTTARAKHAND

Yudh Abhyas

- It is a **joint military exercise conducted annually** between the **armies of India and USA.**
- It has **been ongoing since 2004.**
- It is designed to **promote cooperation between the two militaries** while sharing training, cultural exchanges, and building joint operating skills.
- **Yudh Abhyas 2023:**
    - This marks the **19th edition of the joint exercise,** which is **hosted alternately** between both countries.

- The training schedule **focuses on the employment of an integrated battle group under Chapter VII of the UN Mandate**.
- The schedule will **include all operations related to peacekeeping and peace enforcement.**
- The joint exercise will also **focus on Humanitarian Assistance and Disaster Relief** (HADR) operations.
- Troops from both nations will **practice launching swift** and **coordinated relief efforts** in the wake of any natural calamity.
- The exercise will **see the employment of the coalition-integrated battle** group in the mountain and extreme climatic conditions.
- The elements like **heliborne or airborne will be employed.**

Exercises between India and USA:

- **Army**: **Yudh Abhyas and Vajra Prahar**
- **Navy: MALABAR** (Multilateral)
- **Air Force: Cope India, Red Flag** (Multilateral)

BCAS organizes Aviation Security Culture Week

Bureau of Civil Aviation Security (BCAS)

- It was **initially set up as a Cell in the Directorate General of Civil Aviation** in January 1978 on the **recommendation of the Pande Committee,** constituted as a reaction to the hijacking of the Indian Airlines flight on 10th September 1976.
- It was **reorganized into an independent department under the Ministry of Civil Aviation** on 1st April 1987.
- **The aim** of BCAS is **to safeguard civil aviation operations against acts of unlawful interference.**
- The main responsibilities of BCAS include **laying down standards and measures with respect to the security of civil flights at international and domestic airports** in India.
- It is the **authoritarian unit for civil aviation security in India**. It is **controlled by an officer** of the **rank of Director General of Police** and is designated as **Commissioner of Security.**
- **Headquarters: New Delhi**
- It has got four Regional Offices located at international airports i.e., Delhi, Mumbai, Kolkata and Chennai.
- **Functions**:
  - **Laying down Aviation Security Standards in accordance with Annex 17 to the Chicago Convention** of International Civil Aviation Organization (ICAO) **for airport operators, airline operators, and their security agencies** responsible for implementing AVSEC measures.
  - **Monitoring the implementation** of security rules and regulations and **carrying out a survey of security needs.**

- **Ensure that the persons** implementing security controls **are appropriately trained and possess all competencies** required to perform their duties.
- **Planning and coordination** of Aviation security matters.
- **Surprise/Dummy checks** to test the professional efficiency and alertness of security staff.
- **Mock exercise to test the efficacy of Contingency Plans** and operational preparedness of the various agencies.

Chicago Convention

- The Chicago Convention (also known as the **Convention on International Civil Aviation**), **established the International Civil Aviation Organisation** (ICAO), a **specialized agency of the United Nations** charged with **coordinating and regulating international air travel.**
- The Convention was signed by 52 states on 7th December 1944 in Chicago, U.S., and **came into effect on 4 April 1947.**
- It **establishes rules of airspace, aircraft registration and safety and details the rights of the signatories** in relation to air travel.
- The Convention also **exempts air fuels from tax.**
- The Convention p**rovided for the sovereignty of airspace above the territory of each state, together with five freedoms** (later **expanded to nine** by the addition of four unofficial freedoms) which **govern the freedom of states to operate air transport flights** (including the carriage of passengers, cargo and mail) **across, into and within the airspace of other states.**

Want to catch a supernova? There's a new app for that

ZARTH App

- The **ZTF Augmented Reality Transient Hunter (ZARTH)** is built along **the lines of the augmented reality** mobile game.
- It allows the user to do serious science while playing a game.
- **Features**
  - The app uses **the open-source Sky Map** and adds data daily from the Zwicky Transient Facility (ZTF)'s robotic telescope at the **Palomar Observatory in California.**
  - Palomar is also home to one of the oldest, largest, and most powerful telescopes in the world: the 200-inch Hale reflector.
  - The ZTF scans **the entire northern sky every two days** and uses the data to make large area sky maps that have important applications in tracking **near-earth asteroids and studying supernovae**.
  - The app is loaded daily with transients detected in real-time by the ZTF.
  - The transients include **flaring stars** (variable stars that flare up for a short while), **white dwarf binaries** (burnt remains of dead stars that

orbit one another and often merge and explode in supernovae), active galactic nuclei, and several other types.
    - The app **ranks transients by their rarity and importance**, and players can compete with each other to score points and earn daily credits, which are duly listed on the leaderboards.

Transients phenomenon

- Transients refer to **astronomical phenomena** with durations of fractions of a second to weeks or years.
- Typically they are **extreme, short-lived events** associated with the total or partial destruction of an astrophysical object.

What is Lunar Codex? Unique project sending digitised work of 30,000 artists to moon

Lunar Codex

- A **collection of art gathered from artists** will be **stranded on the lunar surface** as a lasting record of human creativity, even in times of war, pandemics, and economic crises.
- This programme is spearheaded by Samuel Peralta, a semi-retired physicist and art collector from Canada.
- The **collection of varied digitised art** will be sent to the moon as a lasting record of human creativity.
- Lunar Codex is **stored on memory cards or laser etched on NanoFiche**, a 21st-century update on film-based microfiche. These will ensure that the art forms reach the lunar surface safely.
- The collection of art is gathered from 30,000 artists, writers, filmmakers, and musicians from 157 countries. The art forms include images, magazines, books, podcasts, movies, and music, which are divided into four capsules.
- The first such capsule is known as the Orion collection, which has already flown around the moon when it launched on the Orion spacecraft as part of NASA's Artemis 1 mission last year.
- In the coming months, a series of lunar landers will take the Lunar Codex capsules to various **destinations, in craters at the moon's South Pole** and a lunar plain called Sinus Viscositatis.

Rare 'Einstein cross' warps light from one of the universe's brightest objects in this stunning image

Einstein cross

- Einstein predicted the **existence of these crosses back in 1915.**
- Einstein's theory of general relativity describes the way massive objects warp

the fabric of the universe, called space-time.
- The latest Einstein Cross has some interesting statistics.
- The main galaxy doing the **lensing lies about 5.998 billion light-years away**. The distant galaxy that it's lensing is more than 11.179 billion light-years away.
- Thus, the foreground lensing galaxy is giving an amazing look at a galaxy in the early Universe.

Makes an Einstein Cross

- When a massive **galaxy sits directly "in front of" a more distant background object** (such as a galaxy or a quasar) the distribution of matter around that galaxy and its gravitational effect can "bend" the light from the object as it passes by.
- In this case, Earth, the lensing galaxy and the quasar have aligned to perfectly duplicate the quasar's light, arranging them along a so-called Einstein ring.

Why are these so rare

- It turns out that **gravitational lensing happens everywhere in the universe**, mostly in the form of so-called "weak lensing".
- Creating an Einstein Cross requires a precise alignment of the lensing body and light source and astronomers refer to this as "strong gravitational lensing".

Gravitational Lensing

- It occurs when **a massive celestial body**, such as a galaxy cluster, causes a sufficient curvature of spacetime for the path of light around it to be visibly bent, as if by a lens.
- The body causing the light to curve is **accordingly called a gravitational lens.**
- An important consequence of this lensing distortion is magnification, allowing us to observe objects that would otherwise be too far away and too faint to be seen.

Indian Air Force Gets Israeli Spike Missiles

Spike Non Line of Sight (NLOS) Anti-tank Guided Missile (ATGM)

- It is a **fire-and-forget anti-tank** and **anti-personnel missile** with a tandem-charge **high-explosive warhead.**
- It is **developed by Rafael Advanced Defense Systems**, a defence technology **company based in Israel.**
- It is **available in man-portable**, **vehicle-launched**, and **helicopter-launched** variants.

- Spike missiles are being **used by the defence forces of Israel and another 38 countries**, **including India,** Netherlands, Germany, Italy, Peru, Spain, Belgium, Brazil, Canada, UK, Philippines, and Singapore.
- **Features**:
    - It can **hit targets from distances of up to 30 kilometres.**
    - **Weight: 71 kg**
    - It **uses an electro-optical seeker that enables** the launch operator **to clearly see targets**, unlike missiles reliant on radar or infrared guidance.
    - The seeker is also **coupled to a datalink** that **enables the launch operator to control the missile in flight** to attack different parts of a tank or select another target, if not abort the strike.
    - **It can be armed with different types of warheads** suited to destroy tanks, air defence systems or for use in urban combat.

Three Indian startups to send satellites in FY24: IN-SPACe

Indian National Space Promotion and Authorisation Centre (IN-SPACe)

- It is a **single-window**, **independent**, **nodal agency** that functions as an **autonomous agency in the Department of Space (DOS).**
- **It is formed** following the Space sector reforms **to enable and facilitate the participation of private players.**
- IN-SPACe is **responsible to promote, enable authorize and supervise various space activities of non-governmental entities including**
    - **building launch vehicles & satellites and providing space-based services**;
    - **sharing space infrastructure** and premises **under the control of DOS/ISRO**;
    - and **establishing of new space infrastructure** and facilities;
- The agency **acts as an interface between ISRO and Non-Governmental Entities (NGEs)** and assesses how to utilize India's space resources better and increase space-based activities.
- It **also assesses the needs and demands of private players**, including educational and research institutions, and **explores ways to accommodate these requirements** in consultation with ISRO.
- **Headquarters: Bopal, Ahmedabad.**

Webb telescope captures marvellous new image of Ring Nebula

Messier 57

- The Ring Nebula is about 2,000 light-years away **in the constellation Lyra**

and was discovered in 1779.
- The object is exceptionally bright and can be spotted with moderately-sized telescopes.
- It was **born from a dying star** that expelled its outer layers into space, making it a planetary nebula.
- Planetary nebulae come in a variety of shapes and patterns, some that include delicate glowing rings, wispy clouds and expanding bubbles.

James Webb Space Telescope

- This telescope was built in **collaboration between NASA, the European Space Agency (ESA) and the Canadian Space Agency** and was launched in December 2021.
- It is presently at a point in space known as the Sun-Earth L2 Lagrange point, approximately 1.5 million km beyond Earth's orbit.
- Lagrange Point 2 is one of the five points in the orbital plane of the Earth-Sun system.
- It's the largest, most powerful infrared space telescope ever built.
- **Objectives:** It will **examine every phase of cosmic history**; from the Big Bang to the formation of galaxies, stars, and planets to the evolution of our Solar System.

India Launches Revolutionary Autonomous Underwater Vehicle 'Neerakshi' With Mine Detection Capabilities

Neerakshi

- It is an **autonomous underwater vehicle (AUV) designed to detect mines.**
- Named "Neerakshi" **meaning "Eyes in the Water"** is **first of its kind in the country** and is expected to undergo user trials by the Indian Navy, Coast Guard, and Army before a commercial launch.
- It is a **collaboration of Kolkata-based warship maker Garden Reach Shipbuilders and Engineers (GRSE) Ltd and** MSME entity **Aerospace Engineering Private Ltd** (AEPL).
- The AUV, **currently capable of mine detection**, is part of GRSE's **broader ambitions to create autonomous sea surface vehicles, sea-based drones,** and explore green propulsion technologies.
- **Features**:
    - It can be used for a va**riety of functions ranging from mine detection to mine disposal to underwater survey,**
    - **It is a 2.1-metre long cylindrical unmanned vehicle** about a **foot in diameter** and **weighing around 45 kg.**
    - It has an **endurance of nearly 4 hours,** and is capable of operating u**p to a depth of 300m.**

NASA's STEREO spacecraft flyby 17 years into its mission

STEREO spacecraft:

- The pair of **STEREO (Solar Terrestrial Relations Observatory) spacecraft** were launched on October 25, 2006, from Florida's Cape Canaveral Air Force Station.
- The two spacecraft were situated **in Sun's orbit, STEREO-A ("Ahead") and STEREO-B ("Behind").**
- The dual-spacecraft mission accomplished its major goal by delivering **the first-ever stereoscopic view of our star.**
- On February 6, 2011, another significant milestone was achieved as both STEREO-A and -B reached a remarkable **180-degree separation in their orbits, which gave us the full sphere image of the Sun.**
- **Significance of STEREO-A**
    - It **will synthesize its views** with those from **Nasa's and the European Space Agency's Solar and Heliospheric Observatory** (SOHO) and Nasa's Solar Dynamics Observatory (SDO).
    - Its distance from Earth changes throughout the flyby, it will optimize its stereo vision for different-sized solar features at different times, akin to adjusting the focus on a several million-mile-wide telescope.
    - It will allow scientists **to understand how a coronal mass ejection's** (CME) magnetic field evolves on its way to Earth.

President to launch advanced frigate Vindhyagiri in Kolkata on August 17

Vindhyagiri frigate

- It is named after a mountain **range in Karnataka.**
- It is the sixth ship of the **Project 17A frigates.**
- These warships are **follow-ons of the Project 17 Class Frigates (Shivalik Class),** with improved stealth features, advanced weapons and sensors and platform management systems.
- Under the Project 17A programme, four ships **by Mumbai-based Mazagaon Dock Shipbuilders** Limited (MDL) and three by **Garden Reach Shipbuilders and Engineers Limited** (GRSE) are under construction.
- The project's first five ships were launched by MDL and GRSE, between 2019-2022.
- These ships have been designed in-house by the Indian Navy's Warship Design Bureau.
- As much as **75% of the orders for equipment and systems** of Project 17A ships are from **indigenous firms,** including MSMEs.

old INS Vindhyagiri

- It was the sixth and last of the Nilgiri class frigates—in its nearly 31 years of

service from 8 July 1981 to 11 June 2012, had seen many multinational exercises and performed maritime surveillance, coastal patrol and anti-piracy operations.
- It was decommissioned after being damaged in an accident with a merchant vessel in 2011.

ISRO's Aditya L1 mission to the sun, reaches spaceport

Aditya-L1 Mission

- Aditya L1 is the **first space-based Indian mission to study the Sun**.
- It will be **launched by the PSLV-XL launch vehicle**.
- The spacecraft **shall be placed in a halo orbit around the Lagrange point 1 (L1) of the Sun-Earth system,** which is about **1.5 million km from the Earth**.
- A satellite placed in the halo orbit around the L1 point has the **major advantage of continuously viewing the Sun without any occultation/eclipses.**
- This will **provide a greater advantage in observing solar activities** and their effect on space weather **in real-time.**
- The spacecraft **carries seven payloads to observe the photosphere, chromosphere and the outermost layers of the Sun (the corona**) using electromagnetic and particle and magnetic field detectors.
- **Using the special vantage point L1**, **four payloads directly view the Sun** and the **remaining three payloads carry out in-situ studies of particles and fields at the Lagrange point L1**, thus providing important scientific studies of the propagator effect of solar dynamics in the interplanetary medium.
- The **other objectives** of Aditya L1 mission w**ill be to understand the drivers for space weather** (origin, composition and dynamics of solar wind), **and identify the sequence of processes that occur at multiple layers** (chromosphere, base and extended corona) **which eventually leads to solar eruptive events**.

Lagrangian points

- Lagrangian points, also known as **Lagrange points or liberation points**, are specific **locations in space where the gravitational forces of two large bodies**, such as a planet and its moon or a planet and the Sun, **produce enhanced regions of gravitational equilibrium.**
- **In these points, the gravitational pull from the two bodies creates a stable or quasi-stable region where a third, smaller object can maintain a relatively constant position** relative to the larger bodies.
- There are **five primary Lagrangian points**, labelled **L1 through L5, in a Sun-Earth system**.
- **L1 (Lagrange Point 1):**
    - It was **found by mathematician Joseph Louis Lagrange**.

- It is located about **1.5 million kilometres inside Earth's orbit, between the Sun and the Earth.**
- The L1 point of the Earth-Sun system **gives a clear view of the sun all the time, without any occultation/ eclipses.**
- **Once the Aditya L1 mission reaches the L1** Lagrange point, **it will be injected to a halo orbit.** A halo orbit is a **type of orbit that allows the satellite to remain in a stable position** between the Earth and the Sun.

New discovery of cracked mud on Mars has scientists hopeful for possible signs of life

Mars Curiosity Rover

- It is a **S. robotic vehicle** designed to **explore the surface of Mars.**
- It was **launched aboard an Atlas V rocket from** Cape Canaveral Air Force Station, Florida **on Nov. 26, 2011, and landed on Aug. 5, 2012,** after taking eight months and 10 days to reach the Red Planet.
- The rover is **currently roaming Mars' landscape looking for signs of life and learning** about the **Red Planet's unique environment**.
- The rover is **part of NASA's Mars Science Laboratory mission** which **tested a novel landing method** that saw the **spacecraft descend on a parachute before its landing system fired up its rockets and hovered** as the rover was lowered down onto the surface.
- **Features**:
  - It is about **3 metres long and weighs about 900 kg.**
  - It **does not rely on solar cells for its energy needs** but rather **draws its electric power from a thermoelectric power generator**, with the **heat source being the radioactive decay of plutonium** and the heat sink being Mars's atmosphere.
- According to NASA, Curiosity **has four main science goals** in support of the agency's Mars exploration program:
  - Determine **whether life ever arose on Mars.**
  - **Characterize the climate** of Mars.
  - **Characterize the geology** of Mars.
  - **Prepare for human exploration.**

NASA's Perseverance rover

- It is a **robotic explorer to land on Mars as part of NASA's ongoing Mars 2020 Mission.**
- **Main Job: Seek signs of ancient life and collect samples of rock and regolith** (broken rock and soil) for possible return to Earth.
- The rover will **collect samples of rock and soil**, **encase them in tubes**, and **leave them on the planet's surface to be returned to Earth at a future date**.
- **Launch**: It was launched on **July 30, 2020**from Cape Canaveral, Florida.

- **Landing**: **Successfully landed on the surface of Mar's** Jezero Crater **on Feb. 18, 2021.**
- **Features**:
    - It is about **3 metres long**, 2**.7 metres wide, and 2.2 metres tall.**
    - It is about the **size of a car**, but weighs only about **1,025 kilograms** with all instruments on board.
    - **Power source: Multi-Mission Radioisotope Thermoelectric Generator (MMRTG).** Converts heat from the radioactive decay of plutonium into electricity.

Course Correction Keeps Parker Solar Probe on Track for Venus Flyby

Parker Solar Probe

- It is a **NASA spacecraft** designed to **study the Sun and its atmosphere**.
- It was **launched on August 12, 2018**, from Cape Canaveral Air Force Station, Florida, and is **currently orbiting the Sun in a highly elliptical orbit that takes it closer to the Sun than any previous spacecraft.**
- The **mission objectives** of the Parker Solar Probe are to **study the structure and dynamics of the Sun's corona, the Sun's magnetic field, and the solar wind.**
- To achieve this, **the probe will make a total of 24 close approaches to the Sun** over the course of its mission, **getting as close as 3.83 million miles** from the Sun's surface, **which is about 7 times closer than any previous spacecraft**.
- **In December 2021, the Parker Probe reached the atmosphere of the sun**. Since then, **it's been looping around the sun**, drawing closer each time, and sending back tons of data about everything it encounters.
- **Features**:
    - **Mass**: **685 kilograms** at launch.
    - **Scientific Instruments**: **Fields Experiment** (FIELDS), **Integrated Science Investigation of the Sun** (ISIS), **Wide Field Imager for Solar Probe** (WISPR), **Solar Wind Electrons Alphas and Protons** (SWEAP).
    - Parker Solar Probe and its instruments are **protected from the Sun by a 4.5-inch-thick (11.43 cm) carbon-composite shield,** which can withstand temperatures reaching nearly 2,500 degrees Fahrenheit (1,377 Celsius).

IIA scientists discover star that challenges previous understanding of star formations

Carbon-Enhanced Metal-Poor (CEMP) star

- The researchers used high-resolution spectroscopic data acquired **using High Dispersion Spectrograph (HDS) attached to SUBARU telescope (Japan**) to

analyze the star's surface chemical composition.

- The team found that **the iron content of the star is thousand times less than** that of the sun and it is heavily enriched with neutron-capture elements.
- The star which defies previous classifications and challenges previous understanding of star formation processes shows signs of having been formed through the combination of **two different neutron-capture processes - the slow (s-) and intermediate** (i-) neutron-capture processes.
- It can help understand how different star formation processes influence the elemental composition of stars.
- Elements beyond iron are created due to reactions in nuclear astrophysics called neutron capture processes.
- The slow (s-) process **is believed to occur in low-mass stars during** the asymptotic giant branch (AGB) phase and the rapid (r-) process is believed to occur in Supernovae and Neutron Star mergers.
- One of the proposed sites for intermediate (i-) **process is low-metallicity low-mass AGB stars.**
- Understanding the relative contributions of these processes to the elemental composition of stars is important for understanding the chemical evolution of galaxies and the origins of the elements in the universe.

Carbon-enhanced metal-poor (CEMP) star:

- These stars are characterized **by diverse heavy elements abundance patterns** and are primarily **classified into four groups**, based on which groups of heavy elements are more abundant.
- These are mostly **dwarf stars, sub-giant stars, or giant stars, and stars** that belong to these evolutionary stages cannot produce elements heavier than iron.

Webb captures Earendel, most distant star ever discovered

Earendel

- It is **a star discovered** by the Hubble Space Telescope in 2022 and it is the most distant and earliest known star.
- It is a **massive B-type star** that is more **than twice as hot as our Sun** and about a million times more luminous.
- It is located in the Sunrise Arc Galaxy and is around 12.9 billion years away.
- Both Webb and Hubble were only able to detect it due to a **natural phenomenon called gravitational lensing.**
- The star happened to be aligned behind a wrinkle in space-time created by the galaxy **cluster WHL0137-08**, which is located between us and Earendel.

Gravitational lensing

- It occurs when **a massive celestial body, such as a galaxy cluster**, causes a

sufficient **curvature of spacetime for the path of light around** it to be visibly bent, as if by a lens.

- The body causing the **light to curve is accordingly called a gravitational lens.**
- An important consequence of this lensing distortion is magnification, allowing us to observe objects that would otherwise be too far away and too faint to be seen.

Scientists discover 'strange' diamonds in meteorite from another planet

- A research team has confirmed the existence of lonsdaleite–a rare hexagonal form of diamond that could be stronger than conventional diamonds– in ureilite meteorites that originated from the mantle of a distant dwarf planet.
- Hexagonal structure of lonsdaleite's atoms could potentially make it harder than regular diamonds, which have a cubic structure.
- According to scientists, the lonsdaleite may have formed from the collision of the dwarf planet with a large asteroid about 4.5 billion years ago.
- his study proves categorically that lonsdaleite exists in nature. We have also discovered the largest lonsdaleite crystals known to date that are up to a micron in size – much, much thinner than a human hair
- The research produced strong evidence that there the lonsdaleite was formed by a supercritical chemical vapour deposition process that happened on the dwarf planet shortly after a "catastrophic collision."
- The team proposes that the lonsdaleite was formed in the meteorites from a supercritical fluid that existed at a high temperature and moderate pressure. During the process, the original shape and textures of the pre-existing graphite would have been preserved. Later, after the environment cooled and the pressure decreased, the lonsdaleite could have been partially replaced by the conventional diamond that the researchers also discovered in the meteorite.

Chennai-based Agnikul Cosmos begins integration of its first satellite rocket with launchpad at SDSC SHAR in Sriharikota

Agnibaan SubOrbital Technological Demonstrator (SOrTeD)

- Agnibaan SOrTeD is a **single-stage launch vehicle powered by AgniKul's patented Agnilet engine,** which is an **entirely 3D-printed, single-piece, 6 kilonewton (kN) semi-cryogenic engine.**
- Unlike traditional sounding rockets that launch from guide rails, **Agnibaan SOrTeD will lift off vertically and follow a predetermined trajectory to perform a precisely orchestrated set of manoeuvres** during flight.
- **Features**:
    - It is a **customisable launch vehicle** that could be **launched in one or two stages**.

- **The rocket stands 18 metres tall** and has a **mass of 14,000 kg.**
- It is **capable of carrying payloads up to 100 kg to an altitude of 700 km in five different configurations.**
- The rocket's **first stage could have up to seven Agnilet engines**, depending on the mission, which are **powered by Liquid Oxygen and Kerosene**.
- The rocket is also **designed for launch from more than 10 different launch ports**.
- To ensure its compatibility with multiple launch ports, **AgniKul has built a launch pedestal named 'Dhanush' that will support the rocket's mobility across all its configurations.**
- The **Agnilet engine**, which powers the entire operation, is the **world's sole single-piece 3D-printed engine.**

A strongly magnetic Wolf-Rayet star is expect

Magnetar

- A magnetar is an exotic type of **neutron star**, its defining feature that it has an ultra-powerful magnetic field.
- The field is **about 1,000 times stronger than a normal neutron star** and about a trillion times stronger than the Earth's.
- Apart from ultra-powerful magnetic fields, magnetars also release **vast amounts of energy in the form of flares, X-rays, and gamma-ray bursts.**
- They are therefore **associated with extreme events in the universe**, making them perhaps the most bizarre objects in the cosmos next to black holes.
- The magnetic field of a magnetar may be **caused by a neutron star's interior** – thought to be made up of neutrons, quarks and exotic states of matter such as Bose-Einstein Condensates – becoming a superconducting fluid.
- Thus, when the star rotates, it would behave like a huge dynamo, generating an immense magnetic field.

Supernova

- A supernova is the name given to the **cataclysmic explosion of a massive star.**
- They are the largest explosion that takes place in space.
- A star can go supernova in one of **two ways:**
  - **Type I supernova:** Star accumulates matter from a nearby neighbour until a runaway nuclear reaction ignites.
  - **Type II supernova:** Star runs out of nuclear fuel and collapses under its own gravity.
- It can emit more energy in a few seconds than our sun will radiate in its lifetime of billions of years.
- They're also the **primary source of heavy elements** in the universe.
- On average, a supernova will occur once every 50 years in a galaxy the size of

the Milky Way.

Wolf-Rayet stars

- These are massive stars that **are near the end of their stellar evolution**.
- They are typically more than 25 times the mass the Sun and lose this mass at a very high rate.
- They **are a rare sight and are among the most luminous**, most massive, and most briefly-detectable stars known to scientists.

As Chandrayaan-3 and Luna 25 prepare to land on Moon, two questions

India's Chandrayaan-3 and Russia's Luna 25 are both in lunar orbit, preparing for a landing on the Moon next week. Luna 25 is expected to go first, on August 21, while Chandrayaan-3 is likely to touch down two days later, on August 23. Both missions are aiming to land in a region where no spacecraft has gone before, near the South Pole of the Moon.

What determines the landing time of the two spacecraft?

- Luna 25 rode on a powerful rocket to reach lunar orbit in just six days after launch on August 10. Chandrayaan-3 took 23 days after launching on July 14, because ISRO still does not have a powerful enough rocket to go directly to lunar orbit. Chandrayaan-3's circuitous route, however, helped save energy and costs.
- August 23 is the beginning of daytime on the Moon. One lunar day is equivalent to about 14 days on Earth, when sunlight is continually available. The instruments on Chandrayaan-3 have a life of just one lunar day, or 14 Earth days. That is because they are solar-powered instruments, and require sunlight to remain operational.
- The Moon gets extremely cold during night time, well below minus 100 degree Celsius. Electronics not specifically designed to operate at such low temperatures can freeze and become non-functional.
- To maximise the time for observations and experiments, it is crucial for Chandrayaan-3 to land at the beginning of the lunar day. If for some reason, it is unable to attempt the landing on August 23, another attempt is supposed to be made the next day. If that too is not feasible, it would wait for one full month — about 29 days —for the lunar day and lunar night to get over.
- Luna 25 has no such restrictions. It too is solar powered, but it also has an onboard generator to provide heat and power to the instruments during night time. It has a life of a year, and the choice of its landing date is not dictated by how much Sun is shining on the Moon.

How far apart will the Indian and Russian missions land?

- But these are still much farther to the south than any other landing on the Moon. All landings have so far happened in the equatorial region, mainly

because this area gets the most sunlight.
- The actual distance between the landing sites of Chandrayaan-3 and Luna 25 could be several hundred kilometres on the lunar surface.
- The polar region of the Moon is expected to get busier in the future, with several upcoming missions seeking to explore this part, mainly because of the greater potential of finding frozen water.

INS Trikand docks in Iran as part of Indian Navy's operational deployment

INS Trikand

- It is a **Talwar-class guided-missile frigate** of the Indian Navy.
- It is the **third and final ship of the second batch of Talwar-class frigates** ordered by the Indian Navy.
- It was **built by the Yantar shipyard in Kaliningrad, Russia**.
- **Commissioning**:
    - INS Trikand was **commissioned into the Indian Navy on June 29, 2013.**
    - The ship **is named after the Trikand Fort**, which is **located near Porbandar, Gujarat.**
    - It is **part of the Indian Navy's Western Fleet** and operates under the Western Naval Command headquartered in Mumbai.
- **Features**:
    - The ship is equipped with **advanced sensors and weapon systems.**
    - It features various **anti-ship and anti-aircraft missile systems, torpedoes**, and a **100mm main gun.**
    - It incorporates **stealth technology,** including **reduced radar cross-section**, to enhance its survivability in hostile environments.
    - It is equipped with **anti-submarine warfare (ASW) capabilities**, including **ASW helicopters and torpedo launchers**, which make it effective in countering underwater threats.
    - With a long reach and a **state-of-the-art combat suite**, the ship is **designed to undertake a wide spectrum of naval operations.**

Australia to buy Tomahawk missiles from US to boost defense

Tomahawk Missile

- It is a **US-made long-range cruise missile** used for **deep land attack warfare.**
- It can be **launched from a ship or submarine** and can deliver its warhead precisely to a target at a long range.
- It is **used primarily by the U.S. and United Kingdom navies.**
- **Features**:
    - It is designed to **fly at subsonic speed while maintaining a low**

altitude, making it difficult to detect on radar.
- It **uses tailored guidance systems** to manoeuvre while at such low elevations.
- It has an **accuracy of about 5 meters** (16 feet).
- The **6-meter (18.4-foot-) long missile** has a **range of up to 2,400 km**(1,500 miles) and can **travel as fast as 885 km** (550 miles) per hour.
- **Propulsion**: It is **powered by a solid propellant during its launch phase**. **Thereafter it is powered by a turbofan engine** that does not emit much heat, which makes infrared detection difficult.
- It is **capable of twisting and turning like a radar-evading fighter plane**.
- It can **carry either conventional or nuclear payloads**.

Hubble Space Telescope captures image of irregular galaxy ESO 300-16

- An irregular galaxy is a galaxy that **does not have a distinct regular shape**, like a spiral or an elliptical galaxy.
- They **range from dwarf irregular galaxies with 100 million times the Sun's mass** to large ones **weighing 10 billion solar masses.**
- They also **contain abundant amounts of gas and dust**.
- **Formation**: There are many ways in which an irregular galaxy can be formed.
  - For example, one can **result from a collision between galaxies**. When this happens, **gravitational forces between separate galaxies interact**, which **causes an irregular type of rotation.**
  - A **young galaxy can also take an irregular form**, suggesting that **it has not yet reached a symmetrical rotation.**
- **Irregular galaxies born from galaxy interactions** or collisions typically **host a mix of older and younger stars.**

Hubble Space Telescope:

- It was built under the supervision of **the National Aeronautics and Space Administration (NASA)** of the United States and was **named after Edwin Hubble,** the foremost American astronomer of the 20th century.
- The HST was **placed into orbit about 600 km (370 miles) above Earth** by the crew of the **space shuttle Discovery on April 25, 1990.**
- It is considered by many to be the **most important scientific tool ever to be built,** having churned out **more than 15 lakh observations** that have been used to publish around 18,000 research papers.
- It is **larger than a school bus in size**, **has a 7.9 feet mirror**, and **captures stunning images of deep space,** playing a major role in helping astronomers understand the universe by observing the most distant stars, galaxies and planets.

ISRO transfers satellite bus technology to private firm

Indian Mini Satellite-1

- It was developed by **the UR Rao Satellite Centre** of Indian Space Research Organisation (ISRO).
- It is a small satellite platform designed to **enable low-cost access to space.**
- **Features**
    - The IMS-1 bus weighs about 100 kilograms and can carry a 30-kilogram payload.
    - The **solar arrays onboard generate** 330 watts of power.
    - It comes with four reaction wheels with a 1 Newton thruster that is good for pointing accuracy with an accuracy threshold of 0.1 Degrees.
    - It was used in previous ISRO missions like IMS-1, Youthsat and Microsat-2D.
- It would enable low cost access to space by providing dedicated platform for payloads **for earth imaging, ocean and atmospheric studies, microwave remote sensing** and space science missions with a quick turnaround time.

Lunar Polar Exploration Mission

Lunar Polar Exploration Mission (LUPEX)

- It is a collaborative venture between **Japan Aerospace Exploration Agency (JAXA)** and the Indian Space Research Organisation (ISRO).
- The mission is scheduled to launch in **2025.**
- LUPEX will use a rover and lander to study the possibility of establishing a base on the Moon, the availability of water ice, and surface exploration technologies.
- JAXA and ISRO are developing the rover and lander, respectively.
- The rover will carry not only the instruments of ISRO and JAXA but also those of the US space agency **NASA and the European Space Agency (ESA).**
- Proposed instruments onboard LUPEX:
    - Ahmedabad-based **Physical Research Laboratory (PRL),** an autonomous unit of the Department of Space, has proposed multiple instruments in the LUPEX mission mainly to carry out measurements on the surface and subsurface near the permanently shadowed polar region of the Moon.
    - The objective of one of the proposed instruments — Permittivity and Thermo-physical investigation for Moon's Aquatic Scout **(PRATHIMA)** — is in-situ detection and quantification of water-ice mixed with lunar surface and sub-surface soil using a rover/lander platform.
    - The aim of another proposed instrument — the **Lunar Electrostatic Dust EXperiment (LEDEX)** — is to detect the presence of charged dust particles and to confirm the dust levitation process in the volatile-rich polar region, and to estimate the approximate dust size and flux of

charged levitated dust particles.

- The mission will provide valuable insights into the lunar polar region and will help to pave the way for future human exploration of the Moon.

Tejas Test Fires Air-to-Air Missile Astra

ASTRA Missile

- It is an indigenous **Beyond Visual Range (BVR) air-to-air missile.**
- It is to engage and destroy highly **manoeuvring supersonic aerial targets**.
- It is designed and developed by the **Defence Research and Development Laboratory (DRDL), Research Centre Imarat (RCI)** and other laboratories of DRDO.
- The indigenous Astra BVR firing from homegrown Tejas fighters is a major step towards 'Aatmanirbhar Bharat'.

LCA Tejas

- It is the lightest, smallest and tailless multi-role supersonic fighter aircraft in its class.
- This aircraft is designed to **carry a range of air-to-air, air-to-surface, precision-guided weapons.**
- It has the air-to-air refuelling capability.
- The maximum payload capacity of **Tejas is 4000 kg.**
- **Speed:** Mach 1.8.

New method gives an accurate analysis of the historical time series of images of the Sun

Equal Contrast Technique (ECT)

- It is known that there are large numbers of regions of **weak magnetic field on the sun,** which vary with time.
- These can be studied using **magnetograms and Ca-K line images** of the sun, as there is a strong correlation between the magnetic field and the Ca-K line intensity of the region on the Sun.
- The magneto-grams are available for short periods, and the characteristics of the instrument change with time.
- Ca-K line images have been available for a long period at Kodaikanal Observatory (KO), for more than 100 years, with no change in the optics of the instrument.
- Similarly, other observatories in the world, such **as Mount Wilson Observatory** (MWO) have had this type of data for about 70 years.
- Using the data obtained at Kodaikanal observatory, the scientists have shown that the correlation between derived plage area (the bright region in the sun's

chromosphere) from the Ca-K images and sunspot number is excellent, even on a daily basis, over a period of about 100 years for the first time.

- **Significance:**
  - This type of accurate analysis of the historical time series of Ca-K images can be useful for **reliable and accurate investigation of variations on the sun** and the effect of **this on the climatic condition** of the earth.
  - It helps in understanding the **dynamics of the sun, solar cycle variations, dynamo processes** in the convection zone and resulting long-term climatic variations on the earth.

Magnetogram

- It is an image taken by an instrument that can detect the **strength and location of the magnetic fields on the Sun.**
- In a magnetogram, grey areas indicate that there is no magnetic field, while black and white areas indicate regions where there is a strong magnetic field.

Ukraine says it destroyed Russian S-400 missile system in Crimea

S-400 Air Defence Missile System

- The **S-400 Triumf** (**NATO: SA-21 Growler**) is a **mobile, surface-to-air missile system**.
- It is **one of the world's most advanced air defence systems** that can **simultaneously track numerous incoming objects**.
- It was **developed by the Almaz Central Design Bureau of Russia.**
- The system e**ntered service in April 2007,** and the first S-400 was deployed in combat in August 2007.
- **India signed a US$ 5.5 billion deal with Russia in October 2018 to acquire five S-400 systems**.
- **Features**:
  - It is equipped with four different missiles that can engage enemy aircraft, ballistic missiles, and AWACS planes at 400 km and 250 km, medium-range at 120 km, and short-range at 40 km.
  - The system can **simultaneously engage 36 targets.**
  - The system is a l**arge complex of radars, control systems** and different types of missiles.
  - The h**ighly automated S-400 has radars that can pick up an incoming object up to 1,000 kilometres away,** track several dozen incoming objects simultaneously and distribute the targets to appropriate missile systems.
  - The c**ommand post detects, tracks and identifies the target.** Then, the tracked object is taken over by manned anti-aircraft missile systems of the complex, which launch the counterattack.

Novel method to compute emission from accreting neutron stars can help understanding them

- Neutron stars can **harbour extreme magnetic fields,** and this work, for the first time, found a methodology to obtain unique solutions **for accretion onto a neutron star.**
- It could help in understanding of underlying **physical processes around Neutron stars** (NS).
- Because of the extreme compactness (mass-to-radius ratio) of NS, they have large **surface gravitational potentials,** which make them an efficient accretor of surrounding matter.
- It may be noted accretion is the process of inflow of matter onto a compact star.
- The accretion dynamics, however, are strongly dictated by the magnetic fields.
- The strong magnetic field of the star restricts the infalling matter from flowing along these field lines until they reach the poles of the star.
- It is near the poles where the matter emits most of its kinetic energy in the form of radiation. This enables the flow to slow down, finally settling down onto the NS surface.
- Accretion flow around **NS is composed of ionised plasma,** which is a soup of protons and electrons.
- Because electrons are almost two thousand times lighter than the protons, they are prone to different radiative emission processes, and hence, these species are expected to exhibit a different temperature distribution than that of the protons.
- Working in this two-temperature regime is not trivial since they suffer from a very basic problem of degeneracy, which arises because of the presence of more variables than the number of equations of motions available.
- Degeneracy implies that the equations of motions, when solved, produces multiple accretion solutions and hence different observable spectrum even for a given set of constants of motion.

Neutron stars

- These are the **remains of the cores** of massive stars that **have reached the end of their lives.**

Chinese navy is testing the most powerful coil gun ever built

Coil Guns

- It is a type of **electromagnetic weapon** capable of launching projectiles with extremely high speed in the blink of an eye.
- They are also known as **Gauss guns** or magnetic accelerators.
- It operates on the principle of electromagnetic induction, applying the principles of electromagnetism to propel a projectile.

- Coil guns feature a series of coils arranged along the barrel of the gun, each one constituting a stage.
- Each coil is energised one after another to create a magnetic field that can levitate and propel a projectile forward.
- The projectile typically stays suspended in the centre of the coil during launch.
- The larger a coil gun, the better its ability to fire projectiles similar to those fired by traditional artillery.

Projectile:

- The projectile used in a coil gun is typically a ferrous or magnetic object, such as a steel ball or a specially designed ferromagnetic projectile.
- This projectile needs to have magnetic properties to interact with the electromagnetic fields generated by the coils.

Advantages over traditional artillery:

- Higher launch speeds and a **shorter preparation time.**
- Coil guns **do not use gunpowder or other chemical propellants**, which means they produce no combustion byproducts.
- **High Precision:** They can be highly accurate due to the precise control over the electromagnetic coils.
- **Low Recoil:** They have much lower recoil compared to firearms.

5th edition of ausindex-23 at sydney

- It is a major **biennial maritime exercise**, being conducted since 2015.
- The exercise will provide an opportunity for both Navies to further bolster inter-operability, gain from best practices and develop a common understanding of procedures for Maritime Security Operations.
- This year's edition was held in Australia.
- **INS Sahyadri** and **INS Kolkata** participated in the exercise along with HMAS Choules and HMAS Brisbane from RAN.
- Besides ships and their integral helicopters, the exercise also witnessed the participation of fighter aircraft and maritime patrol aircraft.

Other Exercises between Australia and India

- **Ex AUSTRA HIND** (Bilateral Exercise with Army)
- **EX PITCH BLACK**(Australia's multilateral air combat training exercise)
- **Malabar Naval Exercise**
- **Quad** (Multilateral Naval Exercise)

Tech is fully integrated into Israel's latest spy plane after 2 years

ORON Aircraft

- It is an Intelligence, Surveillance & Reconnaissance (ISR) mission aircraft.
- It was developed by the Israeli Defence Ministry's Directorate of Defense Research and Development (DDR&D), the Israel Air Force and the Israel Defense Force (IDF) Intelligence unit's naval arm and Israel Aerospace Industries (IAI).
- Features:
    - It is based on the Gulfstream G550 executive jet platform, which has been outfitted with a bevy of sensors and data collection equipment that allows it to rapidly locate targets in all weather conditions.
    - The aircraft combines several capabilities, including aerial imaging, control and radar, and maritime intelligence gathering for the Navy.
    - It will be equipped with layers of automatic data systems based on advanced algorithms and AI.
    - It will enable the IDF to create a real-time comprehensive intelligence picture, including deployment of ground forces, near and far, in routine times and during warfare.

Japan Shoots For The Moon After India; SLIM-XRISM Dual Mission Will Explore The Moon, Study Celestial Phenomena

XRISM Mission

- The X-Ray Imaging and Spectroscopy Mission (XRISM) is a joint mission of the **Japan Aerospace Exploration Agency (JAXA)** and the National Aeronautics and Space Administration **(NASA),** involving contributions from the European Space Agency **(ESA)** and Canadian Space Agency as well.
- **Objective:** The mission aims to observe X-rays coming from deep space and to identify their wavelengths with unprecedented precision.
- It will use state-of-the-art spectroscopy to measure changes in the brightness of celestial objects at different wavelengths.
- It detects **X-rays** with energies ranging from 400 to 12,000 electron volts. (For comparison, the energy of visible light is 2 to 3 electron volts.)
- This range will provide astrophysicists with new information about some of the universe's hottest regions, largest structures, and objects with the strongest gravity.
- **Instruments onboard:** The mission has two instruments, Resolve and Xtend.
    - **Resolve**:
        - It is an instrument that will collect spectroscopic data with far more resolution than X-ray observatories orbiting the Earth do.
        - Resolve must be cooled to just a fraction above absolute zero in order to measure tiny changes in temperature when X-rays hit the instrument's surface.

- **Xtend:**
  - It will operate simultaneously to photograph the cosmos with a resolution comparable to the way our eyes might perceive it if we were to have X-ray vision.
  - While Resolve zooms in, Xtend will zoom out, providing scientists with complementary views of the same X-ray sources over a larger area.

SLIM

- SLIM, or Smart Lander for Investigating Moon, is a compact robotic moon lander with no astronauts aboard.
- Called **'Moon Snipper'** in the Japanese language, it has lightweight equipment for advanced observations and adaptable landings on resource-scarce planets, advancing exploration strategies.
- The most important aim of the **lander** is to demonstrate accurate lunar landing techniques with a precise touchdown.
- The mission plan calls for a landing no more than 328 feet (100 m) from a target inside the moon's Shioli Crater.

RAMBHA aboard Vikram completes first in-situ measurements of lunar plasma over the moon

ISRO said that another instrument on board the Chandrayaan-3 rover Pragyan has confirmed the presence of Sulphur (S) in the south polar region. On August 28, the Laser-Induced Breakdown Spectroscopy (LIBS) instrument aboard Pragyan confirmed the presence of sulphur in the region unambiguously.

Laser-Induced Breakdown Spectroscopy (LIBS)

- This instrument has made the first-ever in-situ measurements of the elemental composition of the lunar surface **near the South Pole.**
- **How does this work?**
  - It is a scientific technique that analyses the composition of materials by **exposing them to intense laser pulses.**
  - A high-energy laser pulse is focused onto the surface of a material, such as a rock or soil.
  - The laser pulse generates **extremely hot and localised plasma.**
  - The collected plasma light is **spectrally resolved and detected** by detectors such as Charge Coupled Devices.
  - Since each element emits a **characteristic set of wavelengths of light** when it's in a plasma state, the elemental composition of the material is determined.
- **Key findings:** Preliminary analyses, graphically represented, have unveiled the presence of Aluminum (Al), Sulphur (S), Calcium (Ca), Iron (Fe), Chromium (Cr), and Titanium (Ti) on the lunar surface. Further measurements have revealed the presence of manganese (Mn), silicon (Si),

and oxygen (O).

- The evidence of the presence of Sulphur **can reveal insights into the formation and evolution of the Moon.**
- Sulphur usually originates from volcanic activities, and its presence on the Moon can offer indications about the Moon's history and composition.
- LIBS payload is developed at **the Laboratory for Electro-Optics Systems** (LEOS)/ISRO, Bengaluru.

CE-20 cryogenic rocket engine tested successfully

As the ISRO is to use CE – 20 cryogenic engine in its 'Mission Gaganyaan' for sending man to space in 2024 and bringing the astronauts back to earth after remaining for three days at an orbit of 400 km, the engine is undergoing a range of tests.

CE-20 cryogenic engine

- It has been designed and developed by **the Liquid Propulsion Systems Centre** (LPSC), a subsidiary of ISRO.
- It will power **the Cryogenic Upper Stage of the LVM3**launch vehicle.
- ISRO will use it for its 'Mission Gaganyaan' for sending man to space in 2024.
- It is the first Indian cryogenic engine to feature a gas-generator cycle.
- It is one of the most powerful **upper-stage cryogenic engines in the world**.
- This engine develops a nominal thrust of 186.36 kN in vacuum.

Cryogenic stage

- The cryogenic stage is technically a very complex system due to its use of propellants at **extremely low temperatures** and the associated thermal and structural problems.
- It uses liquid fuels (**Oxygen** liquifies at -183 deg C and **Hydrogen** at -253 deg C) **that are cooled to very low temperatures.**
- A Cryogenic rocket stage is more efficient and provides more thrust for every kilogram of propellant it burns compared to solid and earth-storable liquid propellant rocket stages.

Indian Navy's warship Mahendragiri launched in Mumbai

Mahendragiri Frigate

- It is the seventh and last stealth frigate of **Project 17A Frigates.**
- It is named after **a mountain peak in Eastern Ghats** located in Odisha.
- The ship is being built by the **Mazagon Dock Shipbuilders Limited** (MDL) in Mumbai.

Project 17A

- The project was launched by the defence forces of India to construct a series of **stealth guided-missile frigates.**
- Under the Project 17A programme, four ships by Mumbai-based Mazagon Dock Shipbuilders Limited (MDL) and three by Garden Reach Shipbuilders and Engineers Limited (GRSE) are being built.
- These warships follow the Project 17 Class Frigates (Shivalik Class) and boast enhanced stealth features, advanced weapons, sensors, and platform management systems.
- Project 17A ships have been designed in-house by the Indian Navy's Warship Design Bureau WDB.
- As much as**75% of the orders for equipment and systems** of Project 17A ships are from indigenous firms, including MSMEs.
- The first six ships of the project have been launched so far by MDL & GRSE between 2019-2023.

First Visuals Of Indian Army's Polish Warmate Suicide Drones During Trials In Ladakh

Warmate

- It is a **micro loitering munition** developed by Polish company WB Electronics.
- It is a **combat mini UAV** that provides a highly targeted strike capability.
- It is a multi-role system performing multiple tasks depending on the type of head installed.
- **Features:**
    - It has a take-off weight of 4kg.
    - Speed and Range: It can fly at a maximum velocity of 150km/h and can operate over a line of sight (LOS) range of 10km.
    - Endurance: It has the ability to stay in the air for up to 30 minutes.
    - Altitude:
        - Its maximum flying altitudes are 500m above ground level (AGL) and 3,000m above mean sea level (AMSL).
        - The operating altitudes of the UAV vary from 30m to 200m above the ground level (AGL).
    - It can be operated from military vehicle platforms such as infantry or armoured personnel carriers.
    - It can carry a variety of warheads, including high-explosive, anti-tank, and thermobaric.
    - It is equipped with a variety of sensors, including a day/night camera and a laser target designator.

Loitering munition

- It is an unmanned aerial vehicle that is designed to **self-destruct** after serving

its purpose.

- The name "loitering" derives from a defining characteristic: the ability to "loiter" in the air for an extended period of time before striking, giving the targeted time to decide when and what to strike.

SOCIETY

Who are the Paharis and Paddaris, proposed for ST status in J&K?

The government has brought a Bill to include four communities in the list of Scheduled Tribes (STs) in Jammu and Kashmir: "Gadda Brahmin", "Koli", "Paddari Tribe", and "Pahari Ethnic Group".

The Constitution (Jammu and Kashmir) Scheduled Tribes Order (Amendment) Bill, 2023 is one of the four Bills relating to the Union Territory that were introduced in Lok Sabha on July 26.

ST communities now

- The dominant ST communities in J&K are the **Gujjars and Bakerwals**, who mainly live in the districts of Rajouri, Poonch, Reasi, Kishtwar, Anantnag, Bandipora, Ganderbal, and Kupwara. Most of them, especially the Bakerwals, are nomadic — they migrate with their livestock to the higher reaches in the summer, and return before the onset of winter.
- With a population of almost 18 lakh, the Gujjar-Bakerwal are the third largest group after **Kashmiris and Dogras** in J&K. They were given ST status in 1991, along with the two smaller groups of **Gaddis and Sippis**. This entitled these four communities to 10% reservation in government jobs and admission to educational institutions; in 2019, they were empowered politically after the Centre announced a 10% quota for them in Lok Sabha and Assembly seats in J&K.
- The proposed expansion of the ST list has triggered unrest among the Gujjar-Bakerwal, who apprehend a shrinking of their share of the quota benefits pie.
- Gujjar-Bakerwal leaders are especially agitated with the proposed ST status for Paharis and Paddaris. Gadda Brahmins and Kolis are very small communities; also, according to the protesters, Gadda Brahmins are a branch of the Gaddis while Kolis are a sub-caste of Sippis — both these communities are already in the ST list.

Pahari Ethnic Group

- The Paharis are Hindus, Muslims, and Sikhs, and include people of Kashmiri origin who settled in the districts of Rajouri and Poonch over a period of time. There are upper caste Hindus among the Paharis; also people who were displaced from Pakistan Occupied Kashmir.
- The Paharis finally got 4% reservation in jobs and educational institutions in 2019, when Satya Pal Malik was Governor. Also in 2019, the Justice (retd) **G D Sharma Commission** was appointed to identify groups that were socially, educationally, and economically backward. The Commission in its report recommended ST status for Gadda Brahmins, Kolis, Paddari Tribe, and Pahari Ethnic Group. The report was sent to the Tribal Affairs Ministry, and the Registrar General approved it in 2022.

Paddari Tribe

- They live in the remote Paddar area of the hilly Kishtwar district. Spread over two tehsils, the Paddari homeland borders Zanskar (Ladakh) in the north and the east, Pangi in Himachal Pradesh in the south, and the rest of J&K in the west.
- The 2011 census recorded the Paddari population at 21,548, comprising 83.6% Hindus, 9.5% Buddhists, and 6.8% Muslims. The people of the area, including those who have come from elsewhere to settle there, speak the Paddari language.
- Like in the case of the Paharis, the Gujjar-Bakerwal opposition to the proposed inclusion of the Paddari Tribe in the ST list is based on the argument that they do not constitute a single ethic group, but are a mix of individuals from different castes and religions who speak a particular language.

GI tags for Goan mangoes and bebinca, crafts from Rajasthan and U.P.

Seven products from across India, including four from Rajasthan, were given the Geographical Indication (GI) tag by the Geographical Indications Registry in Chennai.

The GI tags were secured by '**Jalesar Dhatu Shilp**' (a metal craft), '**Goa Mankurad Mango**', '**Goan Bebinca**', '**Udaipur Koftgari Metal Craft**', '**Bikaner Kashidakari Craft**', '**Jodhpur Bandhej Craft**', and '**Bikaner Usta Kala Craft**'.

The application for the mankurad mango was filed by the All Goa Mango Growers Association, Panaji. This variety of mango is also known as malcorada, cardozo mankurad, corado, and Goa mankur. The Portuguese named the fruit malcorada, which means 'poor coloured', and with time, it became mankurad *aamo* (mango) in Konkani.

The application for the Goan bebinca was filed by the All Goa Bakers and Confectioners Association. Bebinca, also known as the 'queen of Goan desserts', is a traditional Indo-Portuguese pudding.

At Jalesar in Uttar Pradesh's Etah district, once the capital of Magadha king Jarasandha, over 1,200 small units are engaged in making 'Jalesar Dhatu Shilp', including *ghungru*s (anklets), *ghanti*s (bells) and other decorative metal craft and brassware. The Thatheras community, which resides in a *mohalla* (locality) named Hathuras, makes these products.

Rajathan's crafts

- Four different crafts from Rajasthan given GI tags is 'Udaipur Koftgari Metal Craft', weapons are exquisitely ornamented by a complicated process of etching designs, heating, and then cooling, intertwined with embedding gold

and silver wire into the metal, pressing and flattening it to a smooth surface with moonstone, and finally polishing it.

- Bikaner Kashidakari Craft traditionally created on cotton, silk or velvet with a variety of fine stitches and mirror-work, mainly for objects associated with marriage, especially gift items. The mirrors are believed to repel the 'evil eye' with their reflective surfaces. The weaving of fabrics by hand used to be done by the **Meghwal community** in Bikaner and nearby districts.
- The 'Jodhpur Bandhej Craft' is the Rajasthani art of tying and dyeing. Bandhej is one of the most famous textile art forms of Rajasthan. The fabrics used for Bandhej are muslin, silk and voile. Cotton thread is used for tying the fabric.
- The 'Bikaner Usta Kala Craft' is also known as gold *nakashi* or gold *manauti* work due to the prominence of its long-lasting golden colour. Untreated raw camel hide is processed and moulded by the Dapgar community of leather craftspeople for the requirements of the Usta.

Over 57% of Sanjeevani beneficiaries are women

eSanjeevani

- It is a **cloud-based integrated telemedicine solution** of the **Ministry of Health and Family Welfare**, Govt. of India.
- It is a **telemedicine app** that provides both **doctor-to-doctor** and **doctor-to-patient telecommunication.**
- It is being designed, **developed,** deployed, **and maintained by The Centre for Development and Advanced Computing (C-DAC), Mohali.**
- Two modules of eSanjeevani:
    - **eSanjeevani AB-HWC:**
        - The **doctor-to-doctor telemedicine platform**, **being implemented at all the Health and Wellness Centres (HWCs)** in the country under the Ayushman Bharat (AB) Scheme of Government of India.
        - It **operates on a Hub-and-Spoke model** wherein the 'Ayushman Bharat-Health and Wellness Centers' **(HWCs) are set up at the state level,** which is **connected with the hub** (**comprising MBBS**/ Specialty/Super-Specialty **doctors) at the zonal level.**
        - It was **rolled out in 2019.**
    - **eSanjeevani OPD:**
        - It is the **Patient-to-Doctor remote consultation services** rolled out in 2020 **amid the first lockdown imposed to fight the Covid-19** pandemic, while the Outpatient Departments (OPDs) in the country were closed.
        - It **enables people to get outpatient services** in the confines of their homes.

Govt sets fresh target of 63 lakh loans for street vendors by year-end

PM Street Vendor's AtmaNirbhar Nidhi (PM SVANidhi) Scheme

- It was launched by the **Ministry of Housing and Urban Affairs** on June 01, 2020.
- **Purpose**: To provide **affordable Working Capital loans to street vendors** to resume their livelihoods that have been **adversely affected due to the Covid-19 lockdown.**
- It is a **micro-credit facility** that provides street vendors with a c**ollateral-free loan of Rs 10,000 with low rates of interes**t (below 12%) **for a period of one year**, aiding the vendors in getting back on their feet financially.
- The **duration of the scheme** initially **was until March 2022.** It has been **extended till December 2024**, with a **focus on enhanced collateral-free affordable loan corpus**, **increased adoption of digital transactions** and holistic socio-economic development of the Street Vendors and their families.
- **Who is Eligible for the Loan?**
    - **All vendors who have been vending from or before (March 24, 2020**) and **with a certificate of vending** can avail the loan.
    - **As per the Street Vendors Act 2014**, the **Town Vending Committees**(which comprises the local authorities and vendors from an area) i**ssue a certificate of vending** after a survey has been conducted of all the vendors.
- **Scheme Benefits:**
    - Vendors can avail of a **working capital loan of up to Rs. 10,000,** which is repayable in **monthly instalments** in the **tenure of one year.**
    - **On timely/ early repayment** of the loan, **an interest subsidy @ 7% per annum** will be **credited to the bank accounts** of beneficiaries through Direct Benefit Transfer **on a quarterly basis.**
    - There will be no **penalty on early repayment of loan.**
    - The scheme **promotes digital transactions through cash back incentives** up to an amount of Rs. 100 per month.
    - The **vendors can avail the facility of escalation of the credit limit on timely/ early repayment of loan.**
- **Implementation agency**: **Small Industries Development Bank of India (SIDBI)**

Steps taken by the Government for Gender Inclusion Fund

Gender Inclusion Fund (GIF)

- The fund will be utilised to ensure that **all kids receive a high-quality education.**
- It will also be **used to guarantee that amenities** such as secure and sanitary vending machines are included on GIF's infrastructure checklist.
- The NEP focuses on **'Equitable and Inclusive Education'** which reverberates

the idea that no child should be left behind in terms of educational opportunity because of their background and socio-cultural identities.

- It has taken into account the concerns of the Socio-Economically Disadvantaged Groups (SEDGs) which **includes female and transgender individuals.**
- NEP prescribes to approach gender as a cross-cutting priority to achieve gender equality in education with the partnership of states and local community organizations.
- The objectives of NEP for equitable and quality education for girl children are being met through specific provisions under Samagra Shiksha 2.0 by allocating dedicated resources for **Socio-Economically Disadvantaged Groups** (SEDGs).
- Under **Samagra Shiksha,** various interventions have been targeted for providing quality education to girls, which include:
    - Opening of schools in the neighbourhood to make access easier for girls,
    - Free uniform and text-books to girls up to class VIII,
    - Additional teachers and residential quarters for teachers in remote/hilly areas,
    - Appointment of additional teachers including women teachers,
    - Stipend to CWSN girls from class I to class XII, separate toilets for girls,
    - Teachers' sensitization programmes to promote girls participation,
    - Gender-sensitive teaching-learning materials including text books etc.
- To reduce gender gaps at all levels of school education, **Kasturba Gandhi Balika Vidyalayas (KGBVs),** which are residential schools from class VI to XII for girls belonging to disadvantaged groups such as SC, ST, OBC, Minority and Below Poverty Line (BPL), are sanctioned in Educationally Backward Blocks.

For the first time in Asia, World Coffee Conference to be held in Bengaluru

- It is the **first time India** is hosting the conference.
- The earlier editions of WCC were held in London (2001), Brazil (2005), Guatemala (2010), and Ethiopia (2016).
- The event, is to be jointly organised by the Coffee Board, the Ministry of Commerce and Industry and **International Coffee Organisation.**
- **Mascot of the conference:** Coffee Swami
- **Theme:** Sustainability through Circular Economy and Regenerative Agriculture.

International Coffee Organisation

- It is a body set up in 1963 under **the auspices of the United Nations** to boost the economic importance of coffee globally.
- It is the only inter-governmental organisation for coffee and represents 93% of world coffee production and 63% of world consumption.

- **India** is a **member** of this organisation.

Coffee cultivation

- The vast majority of the world's coffee comprises two species — **Coffea Arabica**(Arabica) and **Coffea Canephora** (Robusta).
- Climatic conditions required for coffee production
    - **Climate:** Hot and humid climate for its growth.
    - **Temperature:** Ranging between 15°C and 28 °C
    - **Rainfall:**150 to 250 cm.
    - **Soil: Well-drained, loamy soil** containing a good deal of humus and minerals like iron and calcium are ideal for coffee cultivation.
    - It is generally grown under shady trees.
    - Dry weather is necessary at the time of ripening of the berries.
    - It is grown on hill slopes at elevations from 600 to 1,600 metres above sea level.
- **Coffee growing states in India:** Karnataka, Kerala, Tamil Nadu, Andhra Pradesh and Odisha, among which, Karnataka produces the most with over 70% of the total output.

NHAI introduces 'Rajmargyatra' in a bid to make National Highways safer and more enjoyable – Here's all about the new app

Rajmargyatra Application

- It empowers travellers with comprehensive information **on Indian National Highways** while also offering an efficient complaint redressal system.
- This is user-friendly app which is now available for download on both Google Play Store and iOS App Store.
- The app is currently available in **Hindi and English.**

Features:

- **Comprehensive Highway Information:**
    - It serves as a **one-stop repository** of essential information for National Highway users.
    - Get **real-time weather conditions**, timely broadcast notifications, and access to details about nearby toll plazas, petrol pumps, hospitals, hotels, and other essential services that ensure a seamless and safe journey on National Highways.
- **Hassle-Free Complaint Redressal:**
    - The app comes equipped with an **inbuilt complaint redressal** and escalation mechanism.
    - Users can easily **report highway-related issues**, attaching geo-tagged videos or photos for better clarity.
    - The registered **complaints will be handled in a time-bound manner**, with system-generated escalations to higher authorities in case of any

delays. Users can also track the status of their grievances for complete transparency.

- **Seamless FASTag Services:**
  - It integrates its **services with various bank portals**, making it convenient for users to recharge their FASTags, avail monthly passes, and access other FASTag-related banking services – all within a single platform.
- Over-speeding notifications and **voice-assistance** to encourage responsible and safe driving behaviour.
- With these improvements, 'Rajmargyatra' aims to create a seamless, user-friendly experience for highway users, fostering a safer and more enjoyable journey on Indian National Highways.

PM Modi dedicates Lokmanya Tilak National Award money to Namami Gange Mission

Lokmanya Tilak National Award

- The award was **instituted in 1983 by the Tilak Smarak Mandir Trust.**
- This award is **given every year on 1st August**, the **death anniversary of Lokmanya Tilak,** to persons who have made **remarkable and extraordinary contributions, working for the progress and development of the nation.**

Lokmanya Tilak

- **Bal Gangadhar Tilak**, commonly known as Lokmanya Tilak, was a prominent **Indian nationalist, freedom fighter**, **social reformer**, and **political leader** during the Indian independence movement.
- He was one of the prime architects of modern India and probably the **strongest advocate of Swaraj or Self Rule for India.**
- He **is known for his slogan, "Swaraj is my birthright and I shall have it."**
- He was **born as Keshav Gangadhar Tilak** and his **followers bequeathed upon him the title of 'Lokmanya',** meaning he who is revered by the people.
- **Extremist**:
  - He was considered a **radical Nationalist**.
  - The **British Government termed him the "Father of Indian Unrest".**
- **Organisations**:
  - He **joined the Indian National Congress** Party **in the year 1890**.
  - He also **helped found the All India Home Rule League** in 1916–18 with G. S. Khaparde and Annie Besant.
  - **Tilak started his Home Rule League in Maharashtra, Central Provinces, and Karnataka and Berar region**. Besant's League was active in the rest part of India. It aimed to advocate for self-rule and **raise public awareness about India's right to govern itself.**
- **Literary works:**
  - Tilak was a prolific writer and journalist. He **used his newspaper**, **"Kesari" (meaning Lion) in Marathi and later "Maratha" in English**

to disseminate nationalist ideas.
    - Some of his notable literary works include "**The Arctic Home in the Vedas,**" where he presented his theory that the Vedas originated in the Arctic region, and "**Shrimad Bhagavad Gita Rahasya**," an interpretation of the Bhagavad Gita from a nationalist perspective.
- **Educationist**:
    - Tilak believed in the power of education and **established the Deccan Education Society in Pune in 1884.**
    - The **society founded Fergusson College and the New English School,** which played crucial roles in promoting modern education in Maharashtra.
    - **Tilak taught mathematics at Fergusson College.**
- **Social Reform**: Lokmanya Tilak was also an advocate of social reform. He actively **supported the eradication of social evils like untouchability and child marriage and promoted education for women.**
- **Lal-Bal-Pal**: He had popular leaders such as **Bipin Chandra Pal and Lala Lajpat Rai as his political companion**s, and the **three were popularly known as the 'Lal-Bal-Pal triumvirate**.'
- **Imprisonments**: He was **arrested for sedition on multiple occasions**. His most **prolonged incarceration lasted from 1908 to 1914,** during which he **wrote the famous book "Gita Rahasya"** (The Secret of the Bhagavad Gita).
- In 1916 **he concluded the Lucknow Pact with Mohammed Ali Jinnah**, which provided **for Hindu-Muslim unity in the nationalist struggle.**

Yelagiri hut shelters 200 years of hill tribe history

Yelagiri hut shelters

- The **Malaiyali tribes' people** were foragers who settled in the upper Nillavur region of Yelagiri and began cultivating its tabletop peak for food.
- Initially living in makeshift huts, they found a permanent solution in the red loam clay abundant in the hills and constructed simple one-room structures that measured 16 by 22 feet.
- These shelters are **made of dry bamboo leaves**; the thatched roof is waxed with cow dung to prevent it from leaking during the monsoon season.
- This covering tends to make the house appear deceivingly small from the outside, but it has enough space to **house eight people and a paran (attic)** that was used to store pots and other household items.
- The hut was meant for people to live in but eventually turned into a storage space for the seeds we collected before the sowing period began.
- A unique feature of **the munn veedu (mud house) or andara kotai (storage facility)** is that it stands on a stilt-like structure also made of teak wood.

Malaiyali tribe

- The Malaiyali tribe – malai meaning "hill" and yali meaning "people" – is strewn across **Tamil Nadu's hilly regions.**

- The Malayalis have not any claim to be considered as an ancient hill tribe, but are Tamil speaking people who migrated from the plains to the hills in comparatively recent times, probably during the middle of eighteenth century.

President Murmu pays tribute to Matangini Hazra, Kanaklata Barua: Who were these freedom fighters

Matangini Hazra

- Hazra was 73 when she fell to British bullets, leading a march during the Quit India movement of 1942, in Tamluk in West Bengal.
- In the early 1900s, the Nationalist movement began gaining traction across the subcontinent and Gandhi travelled extensively across the length and breadth of the region, raising awareness about the freedom movement.
- She was arrested and sentenced to six months of hard labour. While weakened by the harsh sentence, Hazra went back to her social work immediately after her release.
- At the age of 61, she was arrested for taking part in the Civil Disobedience Movement in 1930 and the Salt March led by Gandhi. Her participation in the Civil Disobedience Movement led to several short stints in prison. It was during this time when she became an active member of the Indian National Congress and started spinning her own khadi in Gandhi's footsteps.
- Her involvement with the freedom struggle intensified during the Quit India Movement launched by Gandhi in August 1942. In September that year, a 73-year-old Hazra led a large procession of around 6,000 protesters, mostly women. The procession marched with the aim to take over the Tamluk police station from British authorities.
- In the skirmish that followed between protesters and the police, Hazra stepped forward to appeal to the police to not shoot at the procession. Her pleas went unheard and British police personnel shot at her thrice.

Kanaklata Barua

- One of the youngest martyrs of the Quit India Movement, Kanaklata Barua has an iconic status in Assam. Barua, then 17, led the Mrityu Bahini, a procession of freedom fighters, to unfurl the Tricolour at Gohpur police station on September 20, 1942. When police did not let them move forward, an altercation led to firing, killing Barua at the head of the procession.
- In 2020, the Coast Guard named a Fast Patrol Vessel (FPV) after her, the ICGS Kanaklata Barua.

'GI tag to Mushkbudji will transform farmers of Sagam into entrepreneurs'

Mushkbudji Rice

- It is short bold aromatic rice grown in **higher reaches of Kashmir valley.**
- The cooked rice is unique and possesses a harmonious blend of taste, aroma and rich **organoleptic properties.**
- It is mainly is grown in areas of **Sagam, Panzgam and Soaf Shali of district Anantnag** and Beerwah belt of district Budgam.
- The consumption of aromatic rice in Kashmir has now been limited to special occasions, marriages, and festivals.

Geographical Indication Tag

- It is a sign used on products that **have a specific geographical origin and possess qualities or a reputation** that are due to that origin.
- This is typically used for **agricultural products, foodstuffs, wine and spirit drinks**, handicrafts and industrial products.
- The Geographical Indications **of Goods (Registration and Protection) Act, 1999** seeks to provide for the registration and better protection of geographical indications relating to goods in India.
- This GI tag is **valid for 10 years** following which it can be renewed.

Powerful sun storm knocks out radio transmissions across North America

Solar Flare

- A solar flare is an **intense burst of radiation** coming **from the release of magnetic energy associated with sunspots.**
- Flares are our **solar system's largest explosive events.**
- They are **seen as bright areas on the sun,** and they can **last from minutes to hours.**
- In a matter of just a few minutes, **they heat the material to many millions of degrees** and **produce a burst of radiation across the electromagnetic spectrum**, including from radio waves to x-rays and gamma rays.
- Although solar flares **can be visible in white light**, they are **often more readily noticed via their bright X-ray and ultraviolet emissions**.
- **Effect on Earth:**
    - The intense radiation emitted during a solar flare can **affect satellite communications, disrupt radio signals**, and even **pose a risk to astronauts in space.**
    - Additionally, the increased solar radiation **can lead to geomagnetic storms,** which may **impact power grids** and **cause auroras** (northern and southern lights) at lower latitudes.

Geomagnetic Storm

- A geomagnetic storm is a **major disturbance of Earth's magnetosphere.**
- These storms **result from variations in the solar wind** that **produces significant changes in the currents, plasmas, and fields in Earth's magnetosphere**.

- The solar wind conditions that are effective for creating geomagnetic storms are **sustained (for several hours) periods of the high-speed solar wind** and **a southward-directed solar wind magnetic field** (opposite the direction of Earth's field) **at the dayside of the magnetosphere.**
- The **largest such storms are associated with solar coronal mass ejections (CMEs**), where a billion tons or so of plasma from the sun, with its embedded magnetic field, arrives at Earth.

Coronal Mass Ejections (CMEs)

- Solar flares are **different to 'coronal mass ejections' (CMEs**), which were once thought to be initiated by solar flares.
- CMEs are **large expulsions of plasma and magnetic field from the Sun's corona** that **propagates outward into interplanetary space**.
- Although some are accompanied by flares, it is now known that **most CMEs are not associated with flares.**
- The **blast of a CME carries about a billion tons of material out from the Sun at very high speeds** of hundreds of kilometers per second.

Kanniyakumari's Matti is distinct with fragrance and honey-like taste

Matti banana variety, native to Kanniyakumari district, which was recently granted the Geographical Indication (GI) tag.

Matti banana:

- There are six known types of the Matti banana and **they are indigenous to Kanniyakumari,** where it thrives in the unique climate and soil.
- They are **known as 'Baby Banana'** which flourishes mainly in Kalkulam and Vilavancode taluks.
- Even if it takes root and yields in other areas, the **fruit will be without the sweet fragrance and honey-like taste** unique to the Matti bananas grown in Kanniyakumari.
- Unlike typical banana bunches that grow straight, the Matti's fingers exhibit a distinct wind-blown appearance.
- Its low **total soluble solids content** (TSSC) recommends it as a **baby food.**
- **Types of Matti Banana**
    - **Nal Matti** boasts a yellowish-orange colour and fine aroma, while **Theyn** [honey] Matti's pulp tastes like honey.
    - **Kal Matti** gets its name from the calcium oxalate crystals forming in its pulp and black dots on the skin.
    - **Nei Matti** exudes the aroma of ghee, and **Sundari Matti**, a Matti clone, with its elongated fingers, thick peel, and creamy white rind, is facing extinction.

Geographical Indication Tag

- It is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin.
- This is typically used for **agricultural products, foodstuffs, wine and spirit drinks,** handicrafts and industrial products.
- The **Geographical Indications of Goods (Registration and Protection) Act, 1999**seeks to provide for the registration and better protection of geographical indications relating to goods in India.
- This GI tag is **valid for 10 years** following which it can be renewed.

India's fight against tobacco needs strength

The health ministry of India has proposed to place nicotine replacement therapies (NRT) under **Schedule K** so that in future they would be available only on the prescription of authorised medical practitioners and not as over-the-counter (OTC) preparation.

Nicotine polacrilex gums, lozenges and transdermal patches are used for NRT.

- At the 89th Drugs Technical Advisory Board meeting held in May 2023, there was a proposal to amend Schedule K. The idea is to place all formulations of nicotine containing up to 2mg-4mg under prescription of authorised medical practitioners and not as over the counter (OTC) preparation.
- Any step undertaken to reclassify it as a prescription drug will limit the product accessibility to prospective tobacco quitters and will also slow down the efforts of the government on tobacco de-addiction.
- India has over a 100 million smokers and accounts for over a fifth of the world's tobacco-related deaths.
- Tobacco-related cancers accounted for 27 per cent of the country's cancer burden in 2020, according to Indian Council of Medical Research (ICMR).
- But now ICMR endorsing the move to put small dosage of NRT under prescription will be counterproductive. It will hinder ease of access, thereby going against the intent of National List of Essential Medicines 2022, in which oral dosage forms of 2mg and 4mg were recently included by the health ministry.
- That is why in the 81st DTAB meeting in 2018, the committee agreed to amend entry no 33 in Schedule K for providing exemption for all nicotine oral formulations containing 2mg of nicotine.
- But the 89th DTAB almost reversed the earlier decision. Under the current meeting it was stated that NRTs may be used by addicts for nicotine substitution in forced periods of abstinence, rather than quitting tobacco.
- But there is absolutely no substantial evidence that proves small dosage of NRT is habit-forming.
- The time taken for blood levels of nicotine to peak is much less for NRT as compared to smoking, which makes it less liable to abuse potential.
- One of the significant cross-sectoral health goals under the health policy of India outlines is relative reduction in prevalence of current tobacco use by 30

per cent by 2025. This needs to be underlined.

- NRT is a WHO-approved therapy for smoking cessation. This was first available in the United States as an over-the-counter (OTC) product in 1996 (patch and gum), with approval of the lozenge and mini-lozenge in 2002 and 2010.
- Since then, nicotine gums (2mg and 4mg) have been granted OTC status worldwide including in Australia, Canada, Germany, Sweden, Switzerland, Norway, Colombia, Iceland, Denmark, New Zealand, Austria, Italy based on its excellent safety and the confidence that patients / consumers can self-medicate responsibly. Nicotine lozenges and transdermal patches are available OTC in the US and the United Kingdom.
- It will be more difficult to adopt NRT once it is placed under prescription as it will serve as an additional barrier requiring the smoker to visit the registered medical practitioner. Many of the tobacco users might go underground and not report, phobic to the rigmarole of obtaining a prescription and then using NRT.

Wider and easy availability of NRT over the counters will help us reduce tobacco use by 30 per cent by 2025. India has become a global leader in spreading awareness around the deadly effects of tobacco consumption. NRT in OTC will save families and help the country.

Heavy rain and floods batter famed Kalka-Shimla heritage railway line

Kalka-Shimla Railway line

- This railway was declared a **UNESCO World Heritage Site** on July 8, 2008.
- It is located at an elevation of 2,152 ft above sea level in Haryana, to the capital of Himachal Pradesh, at 6,808 ft.
- The **narrow gauge "toy train" passes** through 18 stations, 102 tunnels, and over 988 bridges.
- It offers majestic views for most of the route. Passengers see breathtaking valleys, covered with pine, oak, and deodar trees.

UNESCO

- UNESCO stands for United Nations Educational, Scientific and Cultural Organization.
- It is **specialized agency of the United Nations**(UN).
- The constitution, which entered into force in 1946, called for the promotion of international collaboration in education, science, and culture.
- **Headquarters:** Paris, France.
- **Parent Organisation**: United Nations Economic and Social Council
- **Goal:** The primary goals of UNESCO are to contribute **to peace and security by promoting collaboration among nations through education**, science, and culture, and to promote sustainable development and intercultural dialogue.

- UNESCO believes that these areas are crucial for building a more just, peaceful, and inclusive world.

Higher than Umling La, world's highest motorable road coming up in eastern Ladakh, courtesy BRO

Likaru-Mig La-Fukche road

- It is located **close to Hanle in Eastern Ladakh**.
- The **64-km long road** will **connect Likaru to Fukche, situated 3 km from the Line of Actual Control (LAC).**
- Once completed, it **will be the world's highest motorable road** at a height of **19,400 ft in Mig La.**
- This would also p**rovide an alternate land connectivity route to the Fukche advanced landing pad,** which is only 2.5 km away from the LAC.
- It is the **first project in India to be carried out entirely by an All Woman Road Construction Company**. It is led by a five-member All Woman Border Road Task Force.

Umling La Pass:

- Currently, **Umling La in Ladakh,** at a height **of 19,024 ft, holds the record of being the highest motorable road in the world.**
- The construction of this road has been **achieved by the BRO** (Border Road Organization) **as part of "Project Himank".**
- It is a **52-km road** that **connects Chishumle to Demchok villages**. Both these villages lie in **close proximity to the Line of Actual Control (LAC**), and a friction point between India and China.

Who was Madan Lal Dhingra, freedom fighter hanged at 24

Madan Lal Dhingra

- He was an **Indian revolutionary freedom fighter**.
- He was **born on 18 February 1883 in Amritsar**.
- Dhingra **received his early education in Amritsar** and **later moved to England** for further studies. **He enrolled at University College, London,** where he studied engineering.
- **While in England, Dhingra became deeply involved** in the activities of the **Indian independence movement.**
- He **came in contact with the revolutionaries like Vinayak Damodar Savarkar, Shyamji Krishna Varma,** the founder of Indian House, and several others.
- **Curzon Wyllie's assassination:**
    - On July 1, 1909, **Madan Lal Dhingra assassinated Sir William Hutt**

Curzon Wyllie, a retired British Indian Army officer and a prominent official, **during a public meeting in London's Imperial Institute.**
    - **During the trial, he claimed that he had murdered** Curzon-Wyllie **as a patriotic act and in revenge for the inhumane killings of Indians by the British** Government in India.
    - **He was found guilty and sentenced to death**.
    - **He was hanged to death on August 17, 1909**, at the **age of only 24**.
- He **was disowned by his family for his anti-British leanings** – so much so that even after his death his family refused to take his body.

Srinagar's Tulip Garden enters record books as Asia's largest

Indira Gandhi Memorial Tulip Garden

- Indira Gandhi Memorial Tulip Garden, **previously Model Floriculture Centre**, is a **tulip garden in Srinagar, Jammu and Kashmir.**
- It is **the largest tulip garden in Asia,**spread over an area of about **30 hectares.**
- It is **situated on the foothills of the Zabarwan Range with an overview of Dal Lake**.
- The garden was **opened in 2007** with the aim to boost floriculture and tourism in Kashmir Valley.
- The garden is **built on a sloping ground in a terraced fashion** consisting of **seven terraces.**
- The garden **houses about 48 varieties of tulip flowers**. The garden also **has several types of other flowers, including daffodils, hyacinths, roses, narcissus**, and other ornamental plants.
- **Tulip festival:**
    - It is an **annual celebration** that **aims to showcase the range of flowers in the garden** as a part of tourism efforts **by the Government of Jammu and Kashmir.**
    - It is organized during the **onset of the spring season in Kashmir valley.**

Last survivors of Piripkura tribe found in Brazil

Piripkura Tribe

- They are a nomadic tribe from the Mato **Grasso region of Brazil.**
- The tribe is known for its isolation and efforts to maintain its traditional way of life.
- These people have faced significant **challenges due to encroachment** on their land by illegal logging, mining, and other forms of land exploitation.
- Their territory has been under threat from **deforestation and resource**

extraction.

Amazon Rainforest

- Amazon Rainforest is **large tropical rainforest** occupying the drainage basin of the Amazon River and its tributaries in northern South America and covering an area of 2,300,000 square miles
- It comprises about 40 per cent of Brazil's total area.
- It is bounded by the **Guiana Highlands to the north**, the **Andes Mountains to the west**, the Brazilian central plateau to the south, and the Atlantic Ocean to the east.

Children in Congo facing worst cholera outbreak since 2017

Cholera

- It is an acute diarrhoeal infection caused by **ingestion of food or water contaminated with the bacterium Vibrio cholerae.**
- It remains a global threat to public health and an indicator of inequity and lack of social development.
- **Symptoms**
    - It is an extremely virulent disease that can cause severe acute watery diarrhoea.
    - Profuse watery diarrhoea, Vomiting, Leg cramps etc.
- The disease can spread rapidly in areas with inadequate sewage and drinking water treatment.
- Currently, there are three WHO pre-qualified oral cholera vaccines (OCV**), Dukoral, Shanchol, and Euvichol-Plus**.
- All three vaccines require two doses for full protection.

UNICEF

- UNICEF stands for the United Nations Children's Fund.
- It is a **specialised agency of the United Nations** dedicated to providing humanitarian and developmental assistance to children and mothers in developing countries.
- It was established in 1946 and is **headquartered in New York City**, United States.
- The organisation operates in over 190 countries and territories around the world.
- It is working to ensure that every **child has access to basic healthcare, education, nutrition, clean water,** and protection from violence and exploitation.

Discovery of two ancient sculptures at Basrur proves existence of ancient Mylara

cult in coastal region, says Historian

- The two sculptures resemble one **belonging to the 15th century A.D. and another to the 17th century A.D.**
- It shows a royal hero sitting on the horse, holding a sword and a bowl in his right and left hands, respectively.
- But there is no Mylaladevi on the back of the horse. The horse shown holding swords in their right hand was found in another water body.
- Basrur was a historic trading **city of the Medieval period.**
- **Trading guilds** like **Uhayadesi, Nanadesi** and others actively participated in the trade.

Mylara cult

- Mylara is a folk deity identified as a **manifestation of Lord Shiva.**
- This deity, commonly known as **Mailara in Karnataka and as Khandoba in Maharashtra**, has a plethora of other names as well, such as Khanderao and Khandnatha.
- This cult is prevalent in the **southern part of India,** including Karnataka, Maharashtra, Andhra Pradesh, and Tamil Nadu.

Central government imposes 20 per cent duty on export of parboiled rice

Parboiled Rice

- Parboiled rice, **also called converted rice**, is p**artially precooked in its inedible husk before being processed for eating.**
- It h**appens before rice is milled,** that is, before the inedible outer husk is removed to yield brown rice **but before brown rice is refined to make white rice.**
- **In some Asian and African countries,** people have been **parboiling rice since ancient times** as it **makes the husks easier to remove by hand.**
- **The main steps of parboiling are**
    - **Soaking**: **Raw, unhusked rice**, also called paddy rice, is **soaked in warm water to increase the moisture** content**.**
    - **Steaming**: The **rice is steamed until the starch converts into a gel.** The heat of this process also helps kill bacteria and other microbes.
    - **Drying**: The **rice is slowly dried to reduce the moisture content** so that it can be milled.
    - **Husking**: The dried, partially cooked rice is **then milled to remove the outer husk.** The **result is parboiled rice.**
- Parboiling **changes the colour of rice to a light yellow or amber**, which differs from the pale, white colour of regular rice.
- During parboiling, s**ome water-soluble nutrients move from the bran of the rice kernel into the starchy endosperm.** This **minimises some of the nutrient loss** that normally happens during refining **when making white rice.**

- **Benefits:**
  - Parboiling rice **improves its texture, increases its shelf life**, and provides health benefits.
  - Parboiled rice is **higher in fibre and protein than white rice**.
  - Parboiling **reduces the stickiness of rice, so it yields fluffy** and separate kernels once cooked.
  - Additionally, **parboiling inactivates the enzymes that break down the fat** in rice. This **helps prevent rancidity and off-flavors**, **increasing shelf-life**
  - Notably, parboiled rice has **significantly more thiamine and niacin than white rice**. These nutrients are **important for energy production.**
- **Potential downsides**:
- It's **less nutritious than brown rice.**
- It **takes a little longer to cook.**

What is Magic rice? What is special about this rice that it got GI tag

Chokuwa rice

- It is also known as Magic rice cultivated in Assam.
- It is a part of Assam's culinary heritage; this unique rice has been a staple of the troops of the mighty Ahom dynasty.
- This unique and healthy rice is cultivated around the Brahmaputra River area.(In several parts of Assam like Tinsukia, Dhemaji, Dibrugarh, etc.)
- It is basically semi-glutinous winter rice, known as Sali rice.
- The sticky and glutinous variety is categorised as Bora and Chokuwa based on their amylose concentration.
- The low amylase Chokuwa rice variants are used to make soft rice, which is known as Komal Chaul or soft rice.
- This whole grain can be consumed after soaking the rice in cold or lukewarm water. This rice variety is widely consumed for its convenience of preparation and nutritional value.
- This unique rice variety is consumed with curd, sugar, jaggery, and bananas to name a few.
- This rice is also used in making several Assamese delights like Pithe and other local dishes.

Geographical Indication Tag

- It is a sign used on products that have a specific geographical origin and possess qualities or a reputation that are due to that origin.
- This is typically used for agricultural products, foodstuffs, wine and spirit drinks, handicrafts and industrial products.
- The Geographical Indications of Goods (Registration and Protection) Act, 1999 seeks to provide for the registration and better protection of geographical indications relating to goods in India.

- This GI tag is valid for 10 years, following which it can be renewed.

President of India inaugurates 'unmesha' and 'utkarsh'

- These festivals were **organised by Sahitya Akademi and Sangeet Natak Akademi**, respectively, with the purpose of celebrating inclusivity and cultural diversity.

UNMESHA

- It is India's most inclusive and **Asia's largest literature festival** in terms of the number of languages represented.
- More than 575 authors in 102 languages are expected to participate in over 75 events in 'Unmesha 2023', and writers from 13 countries will participate in the festival.
- This will be the second edition of 'Unmesha'. The first event was held in Shimla in June 2022.

UTKARSH festival

- It showcases the **folk and tribal Performing Arts**
- It casts a spotlight on the treasure trove of **India's folk and tribal heritage**, endowing these expressive art forms with a resplendent stage to captivate and enthral.
- A poignant tribute to the nation's cultural legacy, 'Utkarsh' serves as a vital launchpad for traditional artists and performers to unfurl their artistry, safeguarding the priceless heritage of myriad communities.
- Amidst its vibrant canvas, 'Utkarsh' brings **forth a vivid tableau of cultural diversity**, nurturing an appreciation for indigenous arts and underscoring their intrinsic value in an increasingly interconnected world.

Sangeet Natak Akademi

- It is the apex body in the field of **performing arts in the country**, was set up in 1953 for the preservation and promotion of the vast intangible heritage of India's diverse culture expressed in forms of music, dance and drama.
- The **Chairman of the Akademi** is appointed by the **President of India** for a term of five years.
- The Sangeet Natak Akademi Awards are the highest national recognition conferred on practising artists.
- The Akademi also confers Fellowships on eminent artists and scholars of music, dance and drama; and has in 2006 instituted annual awards to young artists – **the Ustad Bismillah Khan Yuva Puraskar.**

Sahitya Akademi

- Sahitya Akademi, India's national academy of letters **was established in 1954** by the Government of India.

- As India's premier literary institution, the Akademi **preserves and promotes literature contained in twenty-four Indian languages** recognised by it through awards, fellowships, grants, publications, literary programmes, workshops and exhibitions.
- The Akademi also undertakes literary exchange programmes with various countries across the globe to promote Indian literature beyond the shores of India.

PM Narendra Modi lays foundation of Sant Ravidas temple at Badtuma, Madhya Pradesh

National Automated Fingerprint Identification System (NAFIS)

- The NAFIS is a **pan-India searchable database of crime and criminal-related fingerprints**. It is **managed by the National Crime Records Bureau (NCRB)** at the **Central fingerprint bureau, based in New Delhi.**
- The main objective of the web-based application is to **collect fingerprint data of all the criminals from all the states and the Union Territories.**
- It will **enable law enforcement agencies to upload, trace and retrieve information** from the database 24x7 **in real-time.**
- **The Working Process of NAFIS:**
    - NCRB enables law enforcement agencies to **upload, trace, and retrieve data from the database.**
    - **Within 24 hours**, **NAFIS provides a unique 10-digit National Fingerprint Number (NFN) to each criminal** who is arrested for the crime.
    - The **unique ID will be used for a lifetime of an offender**. **Different crimes registered under different FIRs will be logged as incidents belonging to the same NFN.**
    - The **first two digits of the ID will be the state code** of the state where the criminal is registered, **followed by a sequence number**. The state partition will have IDs belonging to a state.
    - Apart from this, a **digital record will be added as storage to match the fingerprints in the future.**
    - With NAFIS, **it is possible to locate a person of interest in a matter of minutes and connect that individual's name to any active warrants**, warnings, or information about related criminal conduct stored in other police information reference systems.

Hat stones in abundance at archaeology site near Tirunavaya

- **Hat stones**, popularly called Thoppikkallu in Malayalam, are hemispherical laterite stones used as lid on burial urns during the megalithic period are fond here.
- The findings may throw light on the life and culture of people who lived in

those parts **more than 2,000 years ago.**

Megaliths

- These were constructed either **as burial sites or commemorative**(non-sepulchral) memorials
- The former are sites with **actual burial remains**, such as **dolmenoid cists**(box-shaped stone burial chambers), **cairn circles** (stone circles with defined peripheries) and capstones (distinctive mushroom-shaped burial chambers found mainly in Kerala).
- Non-sepulchral megaliths include memorial sites such as menhirs.
- **In India**, archaeologists trace the majority of the **megaliths to the Iron Age**(1500 BC to 500 BC).
- In India, these are concentrated in the states of **Maharashtra**(mainly in Vidarbha), **Karnataka, Tamil Nadu, Kerala, Andhra Pradesh and Telangana**.

Tirunavaya

- It is the land of **ancient Mamankam.**
- It is situated on the banks of **Bharathapuzha river**; it is a place of historical importance.
- In olden days, **Mamankam a grand assembly of rulers** was held once in 12 years here.

PM Modi gifts 'surahi' from Telangana to South African president, Gond painting to Brazil leader

Bidriware

- It is a **form of metal handicraft** that **has Persian influences** and has been **made for centuries by artisans from Karnataka's Bidar district.**
- It is renowned for its **intricate, handcrafted designs.**
- **Origin**:
    - The origin of **Bidriware** as a craft is **attributed mostly to the Bahamani Sultans** who **ruled the region during the 14th and 15th centuries**.
    - It was **first brought to India by the noted Sufi Khwaja Moinuddin Hasan Chisti** in **the form of utensils.**
    - The a**rt form developed** in the kingdom **was a mix of Turkish, Persian and Arabic influences, which were intermingled with the local styles,** and thus a unique style of its own was born.
- This native art form **has obtained a Geographical Indications (GI) registry.**
- **Bidar in Karnataka and Hyderabad in Telangana** are the most **vibrant centers of Bidriware.**
- **How is Bidriware made?**
    - Bidri Ware is **manufactured from an alloy of copper and zinc** (in the

ratio 1:16) **by casting.**
- The **zinc content gives the alloy a deep black colour.**
- The c**raftsman uses small chisels to engrave the design over the freehand etching.**
- **Fine wire or flattened strips of pure silver are then carefully hammered into these grooves.**
- A s**pecial variety of soil,** which is **available only in** the unlit portions of t**he Bidar fort, is used for the final blackening process.** It is **mixed with ammonium chloride and water to produce a paste,** which is then **rubbed onto a heated Bidri surface.** The p**aste selectively darkens the body while it has no effect on the silver inlay.**
- The **product then undergoes a process called buffing to smoothen the surface.**

Artistes breathe a new life into Seethakali folk art

Seethakali

- It is a unique centuries-**old folk art form** that is believed to have originated at Perinad in the Kollam district of Kerala.
- This art form was first performed some 150 years back by the people **of Vedar and Pulayar communities.**
- **Themes**
  - It is based on certain episodes taken from **the Indian epic Ramayana.**
  - Mythic characters such as Rama, Seetha, Ravana and Hanuman come alive in Seethakali performances that portray the tale of Seetha's journey, from the time she accompanied Rama to the woods till her ascent to the heavens.
- In the early times, Seethakali was performed as part of the harvest festival Onam.
- From Atham star till the 28th day after Onam, the performers who belong to the subaltern communities go from one house to another performing this art.
- **The props and instruments** used during performances are all made **of natural materials like bamboo and palm leaves.**
- The costumes and the make-up are loud and eye-catching.
- The characters of Rama and Laxmana appear in green since the colour is used to represent gods and goddesses in Kathakali.
- Currently, in Kerala, there is only one registered Seethakali performing group – Perinad Seethakali Sangham.

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FACTS FOR PRELIMS

Caught in deer snare, tiger dies in TN reserve

Sathyamangalam Tiger Reserve

- **Location:**
  - It is located at the **junction of the Eastern and the Western Ghats** in the **Nilgiri Biosphere Reserve**, in the **Erode District of Tamil Nadu.**
  - Its area is **contiguous with the Mudumalai Tiger Reserve**, **Bandipur Tiger Reserve** (Karnataka) and **BR Tiger Reserve and Wildlife Sanctuary**(Karnataka).
- Together, these reserves — **forming the Nilgiris biosphere landscape** — have the **biggest tiger population in the world**, at over 280 tigers.
- **Terrain**: It is **hilly and undulated** with altitude ranging between **750m and 1649m.**
- **Vegetation**: It consists of **southern tropical dry thorn forests**, **mixed deciduous forests**, **semi-evergreen forests**, and **Riparian forests.**
- **Climate**:
  - It is **subtropical and dry**.
  - The **summers are hot and dry**; the **monsoons are wet and cooler**, with river flooding.
- **Rivers**: Some of the prominent rivers in the region include the **Bhavani, Moyar, and Noyyal rivers**.
- **Tribal Communities:** It is home to several indigenous tribal communities, including the **Irula and Kurumba tribes.**
- **Flora**: Common Species of trees and shrubs found are **Albizzia amara Chloroxylon** swictenia, Gyrocarpus jacquini, **Neem, Tamarind, Sandalwood**, Randi dumetorum, Zizyphus and associates.
- **Fauna**: The major species are **Elephant, Tiger, Panther, Sloth bear, Gaur, Black Buck**, Spotted deer, Wild boar, Black napped hare, Common langur Nilgiri langur, Striped neck mongoose and Bonnet macaque.

'Bhojpatra calligraphy' business by Mana women a boost for economy

Bhojpatra Tree

- It is also **known as Himalayan Birch** and it is widely found in the Himalayas.
- It is a **deciduous tree native to the Western Himalayas** that grows at elevations of up to 4,500 metres
- It has a **high freezing tolerance potential**, allowing it to form a treeline in the Himalayan region.
- It is a **long-lived species** which can survive up to 400 years and the only angiosperm in the Himalaya which dominates an extensive area at sub - alpine altitudes.
- **Distribution:** It is widely distributed in the **altitudinal range from 3100 -**

3800 m in North-western Himalaya.
- It contributes to the **preservation of the Himalayan ecosystem** by reducing soil erosion and creating a bio-shield for the remaining forests and sub-alpine meadows below the treeline.
- The bark of this tree **was used for** centuries in our Country **for writing lengthy scriptures** and texts in Sanskrit and other scripts, particularly in historical Uttarkhand and Kashmir.

India-Papua New Guinea sign MoU for India Stack collaboration

India Stack

- It is a set of **Application Programming Interface (APIs)** that allows governments, businesses, startups and developers to utilise a **unique digital Infrastructure**.
- India Stack consists of **three layers of open APIs**: identity, payments, and data.
- Although the name of this project bears the word India, the vision of India Stack is not limited to one country.
- It can be applied to any nation, be it a developed one or an emerging one.
- The four distinct technology layers provided are
    - **Presenceless layer:** Where a universal biometric digital identity allows people to participate in any service from anywhere in the country.
    - **Paperless layer:** Where digital records move with an individual's digital identity, eliminating the need for massive amount of paper collection and storage.
    - **Cashless layer:** Where a single interface to all the country's bank accounts and wallets to democratize payments.
    - **Consent layer:** Which allows data to move freely and securely to democratize the market for data?
- Some of the APIs that are a central part of India Stack: **Aadhaar Proof, Aadhaar e-KYC, e-Sign, Digital Locker, Unified Payment Interface**
- The Open API team at iSPIRT has been a pro-bono partner in the development, evolution, and evangelisation of these APIs and systems.

API

- In the context of APIs, the word **Application refers to any software** with a distinct function.
- **Interface** can be thought of as a **contract of service between two applications.**
- This contract defines how the two communicate with each other using requests and responses.
- Their API documentation contains information on how developers are to structure those requests and responses.

Climate crisis, tourism may place Venice on UNESCO heritage danger list

- The Italian city of Venice should be added to a list of world heritage sites in danger, experts from the United Nations Educational, Scientific and Cultural Organization (UNESCO) have stated in a new report. Kyiv and Lviv in Ukraine are also on the recommendation for sites to be put on the danger list this year.
- The UNESCO has called on the Italian government to ensure the utmost dedication to address long-standing problems in Venice. The corrective measures proposed by the government so far are still insufficient and need to be further developed, it further said.
- Venice has been grappling for years with too many tourists and the effects of climate change. The UNESCO World Heritage property comprises the city of Venice and its lagoon situated in the Veneto region of northeast Italy.
- The recommendation to put the city on the World Heritage in Danger list was made by UNESCO and advisory body experts in its provisional agenda ahead of the 45th session of the agency's World Heritage Committee. The session is scheduled to be held in Riyadh, Saudi Arabia
- The committee will look at over 200 sites in the September session and decide which ones to add to the danger list. For nearly 10 of these sites, the experts recommend that member states put them on the danger list, among which already are the historic centre of Odessa, Ukraine, the town of Timbuktu in Mali and several sites in Syria, Iraq and Libya.
- There has not been any "significant" progress in addressing the persistent and complex issues related in particular to mass tourism, development projects and climate change, the committee said in its report.
- These issues are "causing deterioration and damage to building structures and urban areas, degrading the cultural and social identity of the property and threatening the integrity of its cultural, environmental and landscape attributes and values," the panel further said.
- In February 2023, the city was in the grips of a drought such that Italian lakes and rivers had dried up. In November 2019, historical treasures and buildings were endangered due to flooding.
- The inclusion of Venice in the danger list had already been proposed by UNESCO two years ago, but it was averted at the last minute due to some emergency measures adopted by the Italian government.

UNESCO's World Heritage Sites

- A **World Heritage Site** is a place that is listed by UNESCO for its **special cultural or physical significance.**
- The list of World Heritage Sites is maintained by the international '**World Heritage Programme**', administered by the UNESCO World Heritage Committee.
- This is embodied in an international treaty called the Convention concerning the Protection of the **World Cultural and Natural Heritage, adopted by UNESCO in 1972.**

- **Sites:**
  - There are around 1,100 UNESCO listed sites across its 167 member countries.
  - In 2021, 'Liverpool — Maritime Mercantile City' in the United Kingdom was deleted from the World Heritage List due to "the irreversible loss of attributes conveying the outstanding universal value of the property".
    - In 2007, the UNESCO panel delisted the Arabian Oryx Sanctuary in Oman after concerns over poaching and habitat degradation, and the Elbe Valley in Dresden, Germany, in 2009 after the construction of the Waldschloesschen road bridge across the Elbe River.
- **Sites in India:**
  - India is home to a total of 3691 monuments and sites. Of these 40 are designated as UNESCO World Heritage Sites.
  - Including places like the Taj Mahal, **Ajanta Caves and Ellora Caves**. **World Heritage Sites also include natural sites like the Kaziranga National Park in Assam.**
    - Harappan city of **Dholavira in Gujarat as India's 40th world heritage site.**
    - **Ramappa Temple (Telangana) was India's 39th World Heritage Site.**
    - **Khangchendzonga National Park,** Sikkim has been inscribed as India's first and the only "Mixed World Heritage Site".
  - In 2022, the Union Ministry of Culture nominated **Sacred Ensembles of the Hoysalas temples** for consideration as a World Heritage site for the year 2022-2023.

CSIR-NAL develops airboat to remove weeds from lakes

JALDOST

- It is an airboat that **operates on water.**
- It is designed to **remove excess aquatic weed** and floating waste from water bodies.
- It has a closed airtight **pontoon type hull to make it inherently unsinkable**.
- According to NAL, it has a hybrid propulsion system, comprising air propulsion and paddle wheel propulsion.
- **How it works?**
  - The ability to travel through weed makes JALDOST an ideal platform to collect them and bring them to the shore.
  - A steel **mesh belt conveyor system fixed** in the front collects the waste. The collected waste falls on the horizontal deck conveyor.
  - After reaching the shore, the collected waste is unloaded by a rear conveyor system to trucks or tractors.
- NAL has developed two versions of the airboat — JALDOST Mark-1 and an

upgraded version JALDOST Mark-2.

National Aerospace Laboratories (NAL)

- It is a **constituent of the Council of Scientific and Industrial Research** (CSIR), India, established in the year 1959.
- It is the only government aerospace R&D laboratory in the country's civilian sector.
- CSIR-NAL is a **high-technology-oriented institution** focusing on advanced disciplines in aerospace.
- It has several advanced test facilities, and many of them are recognized as National Facilities.
- It has provided significant value-added inputs to all **the Indian national aerospace programmes.**
- It has also developed many critical technologies for the strategic sector and continues to support the mission-mode programmes of the country.
- **Mandate:** To develop **aerospace technologies with strong science content**, design and build small, medium-sized civil aircraft, and support all national aerospace programmes.

Ancient Peruvian whale may be most massive creature recorded

Perucetus colossus

- Based on a newly-described fossil of **the whale Perucetus colossus** dating to more than **38 million years ago.**
- Scientists believe that it may have been **heavier than a blue** whale even though it may not have been as long.
- Researchers guess that the species **weighed between 85 and a simply massive 340 tonnes.**
- The animal's bones had an unusually large volume and were also extremely dense.
- This combination of thickening and **densification of bones is called pachyosteosclerosis.**
- The characteristic is absent in living whales, dolphins and porpoise. But it is present in sirenians, a marine mammal group that includes sea cows.
- Whales that dive deep typically have the ability to completely empty their lungs to plummet into the depths of the ocean but **colossus probably lived in shallow coastal areas.**
- This would mean that it probably dived with air in its lungs. But diving with air in the lungs would make it quite difficult to stay near the seafloor—that is where the very heavy bones come in.
- The **skeletal mass of P. colossus** would have been **between five and eight tons,** which is twice that of the blue whale.

Centre Launches 'Study In India' Portal To Help International Students

Study in India (SII) portal

- It is a **dedicated website** to **provide information about higher education institutions (HEIs) in India.**
- **Aim**: **Establishing India as a global hub for education** by welcoming students from diverse backgrounds.
- It will **showcase the academic programmes in the HEIs** covering undergraduate, postgraduate and doctoral programmes as well courses in Indian Knowledge System (IKS) such as Yoga, Ayurveda, classical arts and more.
- The portal **will have information about the academic facilities, research support** and related information **available in the institutes**.
- It will be a **one-stop spot for student registration**, the **visa application process**, choosing the desired courses and receiving offer letters from the institute.
- It will have the **provision for students to apply in more than one institute** or course of their choice.
- It will offer a **streamlined and well-organised application process for international students** seeking higher education opportunities in India.

Study in India (SII) programme:

- It is a flagship project **launched by the education ministry in 2018.**
- **Aim**: **Endorse India as a prime education hub for international students** by inviting them to pursue higher education in the country and explore valuable educational opportunities enabled by top Indian universities.

What is the status of adoption of hydroponic farming in India?

Hydroponics Farming

- Hydroponics is a viable alternative to traditional farming methods for **soil less cultivation** for enhancing productivity and water use efficiency.
- Hydroponics is a new concept in India and gaining popularity among entrepreneurs and innovative farmers, who are looking for sustainable and efficient ways to grow crops.
- At present, this technology is mostly confined to urban farming, rooftop gardening and commercial farming.
- **Cocoponics" or the Soilless production of vegetables**, using **cocopeat as a substrate**, which has been found to be comparatively more successful in many vegetable crops.

India accounts for 35% of cargo handled by Murmansk this year

Murmansk Port

- The seaport of Murmansk is one of the largest **ice-free ports in Russia.**
- It is located on **the Kola Peninsula** at the **coast of Barents Sea.**
- It is about 2,000 km **northwest of Moscow**.
- The port is navigated all year round. The dimensions of vessels calling at the port of Murmansk are not limited.
- The main port capabilities **are located on the western coast of Kola Bay**, among them the mooring berths of the commercial port (including passenger area), fishing port, ship-repair yard, shipyard, oil terminal, and FSUE Atomflot premises.
- On the eastern coast of Kola Bay there is a number of small fish and fleet maintenance terminals.

Kola Peninsula

- It is **situated in northwest Russia** which is one of the most important economic regions in the circumpolar North.
- The region **contains valuable natural resources**, including a wide variety of mineral and fish resources, and is proximate to the large gas fields of the Barents Sea.
- A large population, industrial complexes, and military infrastructure are also characteristic of the region.

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Seven-month-old female tiger cub found dead at Bandhavgarh Reserve in MP

Bandhavgarh Tiger Reserve

- **Location**:
  - It is located in the **Umaria district of Madhya Pradesh.**
  - It is spread over the **Vindhya hills**.
- Bandhavgarh was declared a national park in 1968 and then **became Tiger Reserve in 1993.**
- It **derives its name from the most prominent hillock in the area**, which was said to be **given by Hindu Lord Rama to his brother Lakshmana** to keep a watch on Lanka. Hence the **name Bandhavgarh (Sanskrit: Brother's Fort).**
- It is **known for the Royal Bengal Tigers.**The density of the tiger population at Bandhavgarh is the highest known in India as well as in the world.
- **Topography**: Varies between **steep ridges, undulating forests and open meadows.**
- **Flora**:
  - The vegetation of Bandhavgarh is specially **filled with Sal forestin the valleys, and Bamboo stretches on the lower slopes** of the region.
  - Some of the most famous floral species include Saj (Terminaliatomentosa), Dhaora (Anogeissus latifolia), Tendu, Arjun (Terminalia arjuna), Amla (Emblica officinalis), Palas (Butea monosperma) etc.
- **Fauna**:
  - The important prey species consists of chital, sambhar, barking deer, nilgai, chinkara, wild pig, chowsingha, langur and rhesus macaque.
  - Dependent upon them are the major predators like tiger, leopard, wild dog, wolf and jackal.

Pilibhit Tiger Reserve, TSA join hands for turtles and tortoises conservation

Pilibhit Tiger Reserve

- It **is located** in Pilibhit District, Lakhimpur Kheri District and Bahraich District of **Uttar Pradesh.**
- It lies along the India-Nepal border in the **foothills of the Himalayas and the plains of the 'terai' in Uttar Pradesh.**
- The river **Gomti originates from the reserve**, which is also the catchment of

several others like Sharda, Chuka and Mala Khannot.
- **The Sharda Sagar Dam** extending up to a length of 22 km (14 mi) is on the boundary of the reserve.
- Vegetation: North Indian moist deciduous type.
- **Flora:**
    - It is characterized by **sal forests**, tall grasslands and swamps, maintained by periodic flooding from rivers.
    - The **sal woodland** is very dense with good natural regeneration, amounting to almost 76% of the reserve area.
    - The forest patches are interspersed with grass meadows with several species like Sacchrum, Sclerostachya, Imperata, Themeda, Bothriochloa, Vetiveria, Apluda, Dichanthium, Digitaria and Cyperus.
- **Fauna:** It is home to a myriad of wild animals including the endangered tiger, swamp deer, Bengal florican, hog deer, leopard, etc.

Joe Biden Calls Grand Canyon One Of "Nine" Wonders Of The World

Grand Canyon

- **Location**: It is a **massive geological formation** located in the **state of Arizona, USA.**
- The canyon was **carved by the Colorado River over millions of years** and **exposes a stunning cross-section of Earth's geological history.**
- It **cuts across the Grand Canyon National Park.**
- The **1.5-kilometer deep gorge ranges in width from 500 m to 30 km**.
- **Distinct Rock Layers:**
    - The **exposed rock layers** in the Grand Canyon **represent different periods of Earth's geological history.**
    - The **rocks date back as far as 1.8 billion years**, providing a unique record of the planet's past.

Canyon

- A canyon is a **deep, narrow valley with steep sides or cliffs**, often **carved by the erosional forces of a river or other natural processes** over a **long period of time.**
- Canyons **can vary in size** from small, winding gorges to massive, awe-inspiring chasms like the Grand Canyon.
- **Geological Layers:** Canyons often expose layers of different rock types and geological formations, providing a glimpse into the Earth's history.

Pong dam water release and relentless rainfall submerge 50 villages in Punjab's Gurdaspur

Pong Dam

- The Pong Dam, also known as the Beas Dam, is an **earth-fill embankment dam on the Beas River** in the state of **Himachal Pradesh**.
- The purpose of the dam is **water storage for irrigation** and **hydroelectric power generation.**
- **The construction of the dam began** in the year 1961 and **was completed in 1974** and at that time was known as the tallest of its type in the country.
- The raised water level thus invariably c**reated an artificial lake called the Maharana Pratap Sagar,** after the great ruler of Mewar. The lake **became a renowned bird sanctuary for birds** of numerous species including Bar-headed Goose and the Red-necked Grebe.
- **Features**:
    - The Pong Dam is a **133 m tall and 1,951 m long earth-fill embankment dam** with **a gravel shell.**
    - The dam is **13.72 m wide at its crest**, which sits at an **elevation of about 435.86 m above sea level.**
    - The **base of the Pong Dam is about 610 m wide** and has a total volume of 35,500,000 metre cube.

Beas River

- The Beas River is a **river in north India.**
- **Origin**: The River rises **4,361 metres** above sea-level on the southern face of **Rohtang Pass in Kullu, Himachal Pradesh.**
- **Course**: It flows for some **470 kilometres to the Sutlej River in** the Indian state of **Punjab**.
- The river was **also known as Arjikuja of the Vedas**, or Vipasa to the ancient Indians, and the Hyphasis to the Ancient Greeks.
- **Tributaries**:
    - **The main tributaries** are **Bain, Banganga, Luni, Uhlal, Awa, Banner, Chakki, Gaj, Harla, Mamuni**, Parvati, Patlikuhlal, Sainj, Suketi and Tirthan.
    - The tributaries that branch out in the **Northern part are snow fed and hence, perennial.**
    - The tributaries down the **South are seasonal and get their water from the rains.**

Chairman, Central Water Commission Launches Mobile App 'Floodwatch' To Provide Real-Time Flood Forecasts To Public Using Interactive Maps

Floodwatch App

- This app gives information related to the flood situation **and forecasts up to 7 days on** a real-time basis to the public.
- The in-house developed user-friendly app **has readable and audio broadcast** and all the information is **available in 2 languages, viz. English and Hindi.**

- Other feature of the app includes real-time flood monitoring where users can check up-to-date flood situation throughout the country.
- The app utilizes **near real-time river flow data from various sources**.
- The app also provides flood forecast at nearest location where users can check the flood advisory at the station nearest to them on the Home Page itself.
- The app will also **provide State-wise/Basin-wise Flood Forecast** (up to 24 hours) or Flood Advisory (up to 7 days) which can be accessed by selecting specific stations, state wise or basin wise from the dropdown menu.
- This app utilizes advanced technologies such **as satellite data analysis, mathematical modelling, and real-time monitoring** to deliver accurate and timely flood forecasts.

Central Water Commission

- It is a premier Technical Organization of India in the field of Water Resources.
- It is presently functioning as an **attached office of the Ministry of Jal Shakti, Department** of Water Resources, River Development and Ganga Rejuvenation.
- **Functions**
    - The Commission is entrusted with the general responsibilities of initiating, coordinating and furthering in consultation of the State Governments concerned, schemes for control, conservation and utilization of water resources throughout the country.
    - It also undertakes the investigations, construction and execution of any such schemes as required.
- It is headed **by a Chairman**, with the **status of Ex-Officio Secretary** to the Government of India.

WHO South-East Asia region adopts Gandhinagar Declaration to enhance efforts to end TB

Gandhinagar Declaration

- It was **adopted at the end of the two-day meeting held in Gandhinagar**, Gujarat**, to follow up on the progress made to end tuberculosis (TB) by the countries** **of the WHO South-East Asia Region.**
- The Declaration **calls for establishing high-level multisectoral commission reporting to the highest political level in each country for synergy of efforts among various stakeholders** and to monitor progress towards ending TB and other priority diseases.
- **These high-level multisectoral commission on TB** could **also help build responsive health systems and advance universal health coverage** and health security.
- The declaration calls for ensuring appropriate adoption and **use of science and technology for equitable and human rights-based TB services** that are **accessible to all,** irrespective of any social, cultural, or demographic divide, **through an integrated, primary health care approach.**

- It **emphasises on the allocation of necessary resources to meet TB service coverage targets and address social determinants** to have a multi-disease impact.
- The declaration **calls on WHO to maintain TB as a Flagship Priority Programme over the coming years** and **provide leadership and technical support to countries** for sustained and accelerated approaches supported by research and innovation.
- It **calls upon all partners to enhance their support to end TB and priority diseases in the Region as per the UN Sustainable Development Goals target 3.3 -** End the epidemics of AIDS, tuberculosis, malaria and neglected tropical diseases and combat hepatitis, water-borne diseases, and other communicable diseases.

Female genital mutilation leads to over 40,000 excess deaths in Africa annually: Research

Researchers from the Universities of Birmingham and Exeter in the United Kingdom analysed the numbers of girls subjected to FGM in Benin, Burkina Faso, Cameroon, Chad, Cote D'Ivoire, Egypt, Ethiopia, Guinea, Kenya, Mali, Niger, Nigeria, Senegal, Sierra Leone and Tanzania.

They discovered that a 50 per cent increase in the number of girls undergoing FGM increased their five-year mortality rate by 0.075 percentage point and led to an estimated 44,320 excess deaths per year across these countries.

It is the name given to procedures that involve altering or injuring the female genitalia for non-medical or cultural reasons, and is recognised internationally as ***a violation of human rights and the health and integrity of girls and women.***

Types:

WHO classifies ***four types of FGM:***

1. type 1 (partial or total removal of the clitoral glans).
2. type 2 (partial or total removal of the external and visible parts of the clitoris and the inner folds of the vulva).
3. type 3 (infibulation, or narrowing of the vaginal opening through the creation of a covering seal).
4. type 4 (picking, piercing, incising, scraping and cauterising the genital area).

Where is it practiced?

Most girls and women who have undergone FGM live in sub-Saharan Africa and the Arab States, but it is also practiced in some countries in Asia, Eastern Europe and Latin America. Countries where FGM is performed include Burkina Faso, Central African Republic, Chad, Democratic Republic of Congo, Sudan, Egypt, Oman, United Arab Emirates (UAE), Iraq, Iran, Georgia, Russian Federation, Columbia and Peru,

among others.

Why prevent FGM?

As per ***the World Health Organization (WHO),*** globally, ***over 200 million girls alive today have suffered FGM in over 30 countries.*** The economic costs of treating health complications arising out of FGM amount to roughly $1.4 billion for 2018 for 27 countries where FGM is performed. If the prevalence remains the same, the amount is expected to rise up to $2.3 billion by 2047.

India's first 3D-printed post office inaugurated in Bengaluru

Multinational company Larsen & Toubro Limited built the post office with technological support from IIT Madras under the guidance of Professor Manu Santhanam, Building Technology and Construction Management Division, Department of Civil Engineering.

Invented in the 1980s, 3D printing burst into the mainstream around the 2010s, when many thought it would take over the world.

The technology, however, at the time was expensive, slow and prone to making errors. In recent years, some of these flaws have been done away with, making 3D printing more prevalent than ever before. For instance, it's being used in automotive and aerospace sectors to make parts of cars and rockets respectively.

3D printing

- **3D printing**, also known as additive manufacturing, is a process that uses computer-created design to make three-dimensional objects layer by layer.
- It is an additive process, in which layers of a material like plastic, composites or bio-materials are built up to construct objects that range in shape, size, rigidity and colour.

How is 3D printing done?

- To carry out 3D printing, one needs a personal computer connected to a 3D printer. All they need to do is design a 3D model of the required object on computer-aid design (CAD) software and press 'print'.
- 3D printers construct the desired object by using a layering method, which is the complete opposite of the **subtractive manufacturing processes**. Think about the great Italian sculptor Michelangelo making his masterpiece sculpture David. He famously carved out the colossal statue from one single block of marble. This is an ideal example of the subtractive manufacturing method.
- 3D printers, on the other hand, build from the bottom up by piling on layer after layer until the object looks exactly like it was envisioned.
- The (3D) printer acts generally the same as a traditional inkjet printer in the

direct 3D printing process, where a nozzle moves back and forth while dispensing a wax or plastic-like polymer layer-by-layer, waiting for that layer to dry, then adding the next level. It essentially adds hundreds or thousands of 2D prints on top of one another to make a three-dimensional object
- Notably, these machines are capable of printing anything from ordinary objects like a ball or a spoon to complex moving parts like hinges and wheels.

What are some of the notable examples of 3D printing?

As mentioned before, 3D printing is being used in a host of different industries like **healthcare, automobile and aerospace**. In May this year, aerospace manufacturing company Relativity Space launched a test rocket made entirely from 3D-printed parts, measuring 100 feet tall and 7.5 feet wide. Shortly after its take off, however, it suffered a failure.

At the peak of the Covid-19 pandemic in 2020, the healthcare industry used 3D printers to make much-needed medical equipment, like swabs, face shields, and masks, as well as the parts to fix their ventilators.

No more bulk SIM cards as government steps in to curb fraud

Sanchar Saathi portal

- The portal aims to provide various reforms and **services related to mobile connections** and telecommunications.
- It has been developed by **C-DoT under the Department of Tele-communications** (DoT) to prevent frauds such as identity theft, forged KYC, banking frauds etc.
- The **portal allows mobile phone** users to:
    - **Check the connections** registered on their names.
    - **Report fraudulent** or unrequired connections.
    - Block the mobile phones which are stolen/lost
    - **Check IMEI** genuineness before buying a mobile phone.
- The **three reforms are being introduced** as part of the portal's framework:
    - **CEIR** (Central Equipment Identity Register): It enables the tracking and blocking of lost or stolen phones anywhere in the country.
    - **Know your mobile connections**: It allows users to check the number of mobile connections issued in their name by logging in using their mobile number. This feature helps identify any unauthorized or unwanted connections, which can be blocked immediately.
    - **ASTR** (**Artificial Intelligence and Facial Recognition** powered Solution for Telecom SIM Subscriber Verification): This AI-based technology facilitates mobile connection analysis and includes features such as IMEI-based phone theft information messaging to law enforcement agencies and the owner. It also enables blocking of any number associated with a particular IMEI and the tracking of stolen mobile devices.

- The portal and its reforms aim to enhance transparency, security, and accountability in the telecom sector.

Highly contagious virus hit 49 countries since 2021

Only way to contain the virus is to cull the infected, in-contact pigs and bury them in lime-treated deep trenches

African Swine Fever (ASF)

- Large DNA virus of the Asfarviridae family.
    - Only virus with a double-stranded DNA genome known to be transmitted by arthropods.
    - Affects domestic & wild pigs.
- **Symptoms:** Includes weight loss, intermittent fever, respiratory signs, chronic skin ulcers & arthritis. Acute forms are characterised by anorexia, loss of appetite & haemorrhages in the skin.
- **Transmission:** Through natural hosts (warthogs, bushpigs & ticks) acting as vectors & by direct/indirect contact with infected pigs, their faeces & body fluids.
- **Vaccination:** No approved vaccine yet.
- **Geographical Distribution:** First detected in Kenya in 1909 & currently found in Asia, Europe & Africa.
- **Public Health Risk:** Not risky for humans.

NHPC signs pact with RITES to construct railway siding for 2,880 MW Dibang project

Dibang Multipurpose Project

- It is a **flood control and hydroelectric power project** planned to be developed on the **Dibang River, a tributary of the Brahmaputra River**, in **Arunachal Pradesh**.
- At **2,880 MW of installed capacity**, it will be the **country's biggest hydropower facility**.
- It is being **developed by India's state-run National Hydroelectric Power Corporation (NHPC).**
- **Dibang hydroelectric plant makeup:**
- The project envisages the construction of a **278m-high and 375m-long concrete gravity dam**, which **will be the highest dam structure in the country.**
- The dam will **create a 43 km-long reservoir** with a gross storage **capacity of 3.85 billion cubic metres.**
- It includes **six horseshoe-shaped head race tunnels of length** varying from 300m to 600m with 9m diameter, an **underground Power House**, and six

horseshoe-shaped tail race tunnels of length varying from 320m to 470m with 9m diameter.

Dibang River

- It **flows through Arunachal Pradesh and Assam** states of India.
- It is an **upstream tributary of Brahmaputra.**
- **Origin**: The Dibang originates near **Keya Pass on the Indo-Chinese border** in the Upper **Dibang Valley district of Arunachal Pradesh**.
- **Tributaries**: The **Sisar, Mathun, Tangon, Dri, Ithun and Emra** are the major tributaries of the Dibang.
- The **Mishmi Hills are found along the upper course** of the Dibang River.

ICSSR to study socio-economic impact of Centre's schemes

Indian Council of Social Science Research

- It was established in the year of 1969 by the Government of India **to promote research in social sciences** in the country on the recommendation of Prof. V. K. R. V. Rao Committee.
- It is an **autonomous organisation** funded by the Ministry of Education.
- **Functions:** It provides grants for projects, fellowships, international collaboration, capacity building, surveys, publications etc., to promote research in social sciences in India.
- **The Council aims to:**
    - Review the **progress of social science research** and give advice to its users;
    - Sponsor social science research programmes and projects and administer grants to institutions and individuals for research in social sciences.

Public policy initiatives

- It refers to **the actions, programs, and strategies that governments**, organisations, and institutions implement to address various social, economic, and environmental challenges.
- These initiatives are designed to **influence and guide the behaviour of individuals,** communities, and businesses while achieving specific policy goals.

TRAI to use AI to monitor, measure network quality

Telecom Regulatory Authority of India (TRAI)

- It was **established by an Act of Parliament** called the **Telecom Regulatory**

Authority of India Act, 1997.

- **Purpose**: To **regulate telecom services**, including fi**xation/revision of tariffs for telecom services** which were earlier vested in the Central Government.
- It is responsible for **framing regulations, guidelines, and policies for the telecommunications sector** in India. This includes **setting rules related to tariffs**, **quality of service, and the allocation of spectrum.**
- **Composition**:
    - It consists of a **Chairperson and not more than two full-time members,** and not more than two part-time members.
    - The chairperson and the members of TRAI are **appointed by the Central Government**, and the duration for which they can **hold their office is three years or until they attain the age of 65 years,** whichever is earlier.
- **Government Control over TRAI:**
    - TRAI is **not a completely independent** telecom regulator.
    - Under section 25 of the Act, Central **Government has the power to issue directions which are binding on TRAI.**
    - The TRAI is **also funded by the Central Government**.
- The **recommendations made by the TRAI are not binding** on the Central Government.
- **Central Government has to mandatorily ask for recommendations from TRAI with respect to the need and timing of new service providers and the terms and conditions of the licence to be granted** to the service provider.
- TRAI also **has the power to notify** in the official gazette of **the rates at which telecommunication services are being provided in and outside India**.

These new sorghum varieties might help sub-Saharan Africa meet nutritional needs

- The new varieties are enhanced with **both provitamin A and non-provitamin A carotenoids.**
- These varieties also contain a more efficient phytase enzyme, a protein that breaks down phytic acid. This improves the **absorption of nutrients from the diet.**
- The results show that sorghum made from the strain of this new variety can produce 32 times more provitamin A carotenoids than regular sorghum varieties.
- New healthier sorghum varieties with significant concentrations of provitamin A **carotenoids increase mineral absorption.**
- These sorghum lines also contained **high concentrations of lutein and zeaxanthin,** carotenoids which are important for eye health and brain development.

Sorghum

- It is also **called great millet, Indian millet, milo, durra, or shallu,** cereal grain plant of the grass family (Poaceae) and its edible starchy seeds.
- The plant likely originated in Africa, where it is a major food crop.
- It is the fifth major staple cereal after wheat, rice, maize and barley.
- It is cultivated **worldwide in warmer climates** and is an important food crop in semiarid tropical areas of Africa, Asia and Central America.
- In India sorghum is known as jowar, cholam, or Jonna. Different varieties of sorghum range in colour from white and pale yellow to deep red, purple and brown.
- Sorghum is especially **valued in hot and arid regions for its resistance** to drought and heat.
- It is **tolerant to drought because of its root system**.
- It performs better than maize during drought and occupies areas unsuitable for maize in stress-prone semiarid areas.
- It is tolerant **of salinity and to some extent to waterlogging** for a short period. It is sensitive to frost and to sustain flooding.
- In recent years, there has been a shift in sorghum production from the drier western production areas to the wetter eastern

Nitin Gadkari launches BNCAP

Bharat NCAP(New Car Assessment Programme)

- It is a significant step forward in the government's commitment to improving road safety by raising the **safety standards of motor vehicles up to 3.5 tonnes in India.**
- The programme aims to **provide a tool for car customers** to make a comparative assessment of the crash safety of motor vehicles available in the market.
- Under this programme, car manufacturers can voluntarily offer their cars tested as per **Automotive Industry Standard (AIS) 197.**
- Based on the performance of the car in the tests, the car will be awarded **star ratings for Adult Occupants (AOP) and Child Occupants (COP).**
- To receive **a 5-star rating**, a vehicle needs at least 27 points in adult occupant protection and requires 41 points in child occupant protection.
- These protocols are **in line with Global NCAP** norms when it comes to crash testing.
- Three tests, including offset deformable barrier **frontal impact test, side impact test, and pole side impact test** - would determine the crashworthiness of the vehicles.
- It would also mandate the **installation of six airbags, electronic stability control (ESC), three-point seatbelts for every passenger,** improved emergency braking systems, etc.
- For Bharat NCAP, the frontal crash test will be conducted at a speed of

64km/h. On the other hand, the side and pole-side impact tests will be done at 50km/h and 29km/h

- These norms will also be **applicable for testing and rating CNG and EVs based** on their performance.
- Unlike Global NCAP, Bharat NCAP **will give a unified rating for the vehicles**, combining crash test results for adults and children alike.

Modi inaugurates 'Maitri Setu' between India and Bangladesh

Maitri Setu

- It has been built over the **Feni River,** which flows between the Indian boundary in Tripura and Bangladesh.
- **Length:** It spans 1.9 kilometres joining Sabroom (in **Tripura**) with Ramgarh in Bangladesh.
- The name **'Maitri Setu'** symbolises growing bilateral relations and friendly ties between India and Bangladesh.
- The construction of the bridge has been overseen by National Highways and Infrastructure Development Corporation Ltd.
- It is a pre-stressed concrete bridge. It has a single-span structure that allows for the smooth flow of traffic and cargo.

Feni River

- It forms part of the **India-Bangladesh border.**
- **Origin:** It originates in the South Tripura district, passes through Sabroom town on the Indian side, and meets the Bay of Bengal after it flows into Bangladesh.
- **Length:** It is 116 kilometres in length from its source to the Bay of Bengal.
- **Tributaries:** Some of the notable tributaries of the Feni River include the Muhuri River, Raidak River, Chandkhira River, Ryang River and Kushiyara River.

BL Explainer. Is India emerging as a hub for Gun Jumping?

Gun Jumping

- It essentially means **acting before the appropriate time** and refers to situations where a party or parties to a combination (M&A deal) **consummate a transaction before CCI approves the transaction,** thereby violating standstill obligations.
- It is all about **competition and merger control.**
- Gun Jumping in competition jurisprudence occurs when parties to Mergers and acquisitions **consummate the transaction without keeping the competition authorities informed.**

- Most competition regimes, including India, **require pre-merger notification** (in India, it is the CCI).
- The concept of gun-jumping has not been expressly defined in the Competition Act of 2002.
- The law requires parties to a deal satisfying certain monetary thresholds, to first notify the CCI about the impending transaction.
- Parties are then obligated to conform to **the standstill provisions — wait for 210 days** from the date of notifying or till CCI approval happens, whichever is earlier.
- During the standstill period, the parties are required to continue to operate their businesses as independent entities.
- If the parties fail **to notify CCI before the consummation** of the deal or violate standstill obligations, this is typically referred to as gun jumping.
- **Penalties:**
    - The Competition Commission of India (CCI) has the power to penalise parties for Gun Jumping under **Section 43A of the Competition Act 2002.**
    - The penalty can be as **high as 1 per cent of the total turnover** or 1 per cent of the assets, whichever is higher, of the combination.

ISRO-developed device for fishers' safety successfully tested at Neendakara

Nabhmitra device

- It is a satellite-based communication system developed for the safety of fishermen.
- It enables two-way messaging services from and to the sea.
- The weather and cyclone warnings will be communicated in the local language, the boats can also send distress messages to the authorities.
- In emergency situations like capsizing and fire, fishers can press a button on the device and get in touch with the control centre.
- While the control centre will receive the alert, including the location of the boat, the crew on the boat will get a response message from the control centre.
- Apart from providing information about shipping channels and maritime boundaries, the device will also help to identify fishing fields.
- It was developed by the Indian Space Research Organisation (ISRO).

Govt Warns Of 'Smishing' Attack That Tricks Users Into Revealing Confidential Data

Smishing

- The term "smishing" is a combination of "**SMS**" (Short Message Service) and "**phishing.**"

- **What is it?**
  - A type of phishing attack, smishing, often involves sending fraudulent text messages to individuals with the aim of tricking them into divulging sensitive personal information, such as passwords, credit card numbers, or other confidential data.
- When cybercriminals "phish," they send fraudulent emails that seek to trick the recipient into clicking on a malicious link.
- Smishing simply uses **text messages instead of email.**
- Smishing attacks often involve messages that appear to be from legitimate sources, such as banks, government agencies, or well-known companies.
- **How it works?**
  - Smishing messages typically contain urgent or enticing content to persuade recipients to take immediate action, such as clicking on a malicious link, calling a phone number, or providing sensitive information.
  - Once the victim opens and clicks on the link or dials the phone number listed in the message, they're taken to a fraudulent website or a mobile phone line that's designed to resemble a legitimate source.
  - The victim might be asked to enter sensitive information, such as login credentials, social security numbers, credit card information or personal identification numbers (PINs).
  - Once the victim's sensitive information is divulged, the attacker might steal it to commit fraud for personal gain or to compromise the victim's device by installing malware on it.

IAF contingent departs for Egypt to participate in biennial tri-service exercise BRIGHT STAR-23

EXERCISE BRIGHT STAR-23

- It is a **biennial multilateral tri-service exercise.**
- This multinational **exercise was launched in 1980** as part of the US-brokered peace treaty between Egypt and Israel.
- This is **the first time** that IAF is participating in Ex BRIGHT STAR-23.
- **Participating countries:** United States of America, Saudi Arabia, Greece and Qatar.
- The Indian Air Force contingent will consist of five MiG-29, two IL-78, two C-130 and two C-17 aircraft.
- Personnel from the IAF's Garud Special Forces, as well as those from the Numbers 28, 77, 78 and 81 Squadrons, will be participating in the exercise.
- **Objective:** To practice planning and execution of joint operations. Besides leading to the formation of bonding across borders, such interactions also provide a means to further strategic relations between participating nations.
- India and Egypt have had an exceptional relationship and deep cooperation wherein the two jointly undertook the development of aero-engine and aircraft in the 1960s, and training of Egyptian pilots was done by Indian

counterparts.

Soldiers in Gabon say they've seized power and appointed the republican guard chief as head of state

Gabon

- The Republic of Gabon is located at the Equator in **West-Central Africa,** bordering the Atlantic Ocean.
- **Bordering countries:** It is bordered by Equatorial Guinea and Cameroon to the north and the Republic of the Congo to the east and south.
- A former **French colony**, Gabon retains strong ties to France and to the French language and culture.
- **Independence:** Gabon gained independence from France on August 17, 1960.
- **Government:** It is a presidential republic where the president is both the head of state and the head of government of the country.
- **Capital:** Libreville
- **Language:** Spoken languages are French (official) and a variety of Bantu languages.
- **Currency:** The currency of Gabon is the Central African CFA franc (XAF), a currency used by five other African nations.
- **Religion:**
    - A large majority of Gabon's population is Christian.
    - A small segment of the country's population is Muslim.
    - Adherents of traditional religions also account for a small segment of the population.
- **Climate:** It has an equatorial climate, with year-round high temperatures and humidity.
- Gabon's largest river is the Ogooué.
- About three-fourths of the country is covered by a dense equatorial rainforest containing more than 3,000 species of vegetation.
- It is a member of the United Nations, the African Union, and the Organization of Petroleum Exporting Countries (OPEC).

Formal implementation of multi-million US Dollar MCC pact begins in Nepal

Millennium Challenge Corporation

- MCC is an independent **S. foreign assistance agency** that has the goal of reducing poverty in developing countries.
- It was created by the **S. Congress in 2004** to promote economic growth, open markets, and increased living standards in select countries.
- **How does it work?**
    - MCC forms partnerships with countries that are committed to good governance, economic freedom and investing in their citizens.

  - MCC provides selected countries with large-scale grants to fund projects for reducing poverty through sustainable economic growth.
  - These projects include building infrastructure, reforming institutions, and promoting access to healthcare and education.
  - MCC grants may complement other U.S. and international development programs.
- MCC utilises two primary types of grants: **compacts and threshold programs.**
  - Compacts are large, 5-year grants for countries that pass MCC's eligibility criteria.
  - Threshold Programs are smaller grants awarded to countries that come close to passing these criteria and are committed to improving their policy performance.
- Governing Body: The U.S. Secretary of State, the Secretary of the Treasury, the U.S. Trade Representative, and the USAID Administrator serve on the MCC board along with four private sector representatives.