

Regent Education and Research Foundation Group of Institutions
Daily Current Affairs Synopsis

Date: 10th-30th April 2024

(Useful for UPSC/WBPSC/SSC Exams.)

POLITY/GOVERNANCE	5
Article 31-C of the Indian Constitution	5
Powers of EC in nominal polling process	6
Working of Symbol Loading Unit of EVMs	7
National Centre for Good Governance	8
Essential Programme on Immunisation	9
Project ISHAN	9
Eggshell Skull Rule	10
VVPAT	10
Look Out Circulars	11
NOTA	12
Central Pay Commission	12
Booth Capturing	13
Target Olympic Podium Scheme	13
ECONOMICS	14
Payment Aggregators	14
Performance of rupee over the last 10 years	15
Critical Minerals Summit	16
Small Finance Bank	17
Asset Reconstruction Companies	18
Authorised Economic Operator Programme	18
Paradox of Savings	19
Lending Service Providers	20

Navratna Status	20
Kutch Ajrakh	21
Refund Borrowers Overcharged Interest	21
Bima Vistaar	22

Inflation Expectation Survey of Households	23
Acceptance Sampling	23
Network as a Service	23
IMF's Stand-by Arrangement	24
SOCIAL ISSUES	25
Global Alliance for National Human Rights Institutions	25
Analysing labour on a Warming Planet	26
Thrombocytopenia Syndrome	28
Global Leaders Group on Antimicrobials	28
Hindu Marriage Act, 1955	29
International Labour Day	30
Auto-brewery Syndrome	31
Nephrotic Syndrome	31
NIEPID	32
Vitrectomy	32
Biohacking	33
INTERNATIONAL RELATIONS	33
ASEAN Future Forum	33
World Intellectual Property Day	34
ENVIRONMENT	35
Uttarakhand Forest Fires	35
Deaths caused by lightning	36
Satellite Remote-Sensing to analyse Glacial Lakes	37
Green Taxonomy	39
End date for coal-fired power plants	39
'Unclassed' Forests Missing	41
Red Colobus	42
Haritha Karma Sena	42

Climate Technology Centre and Network	43
La Cumbre Volcano	43
Taam Ja' Blue Hole	44
Goldman Environmental Prize	44
Peucetia chhaparajnrvin	45
Thar Desert	45
Dooars	46
Chakisaurus Nekul	46
Great Rift Valley	46
Chambal River	47
Salmonella	47
SCIENCE AND TECHNOLOGY	48
Indian Ocean Floor Mapping	48
Raman spectroscopy	49
Sympathetic Solar Flare	49
Liquid Nitrogen	50
Antares	50
ISRO's Space Application Centre	51
Advanced Composite Solar Sail System	52
Adsorption	52
Magnetar	53
Antihistamines	53
Mephedrone	54
Opioids	54
TacticAI	54
ART AND CULTURE	55
Patachitra Painting	55
Alagar Temple	55
Raja Ravi Verma	56

Missile assisted-torpedo release system	56
Seizing of drugs	57
ATACMS	58
INS Vikrant	59
Hangor Class Submarine	59
Sierra Madre	60

POLITY/GOVERNANCE

Article 31-C of the Indian Constitution

While hearing a case to decide whether the government can acquire and redistribute private property, a 9-judge Bench of the SC decided to take up another issue of “radical constitutional consequence”: **does Article 31C still exist?**

What is Article 31C of the Indian Constitution?

- **Article 31C** protects laws enacted to ensure –
 - The “material resources of the community” are distributed to serve the common good (**Article 39(b)**) and
 - That wealth and the means of production are not “concentrated” to the “common detriment” (**Article 39(c)**).
- As per Article 31C, these particular directive principles (Articles 39(b) and 39(c)) **cannot be challenged** by invoking the right to equality (Article 14) or the rights under Article 19 (freedom of speech, right to assemble peacefully, etc).

Introduction of Article 31C -

- Article 31C was introduced by **the Constitution (25th) Amendment Act 1971**.
 - The amendment specifically mentioned the “Bank Nationalisation Case”, in which **the SC stopped the Centre from acquiring control of 14 commercial banks** by enacting the Banking Companies (Acquisition and Transfer of Undertakings) Act, 1969.
 - In this case, the court held that **the ‘right to compensation’ was not appropriately ensured** by the Banking Act.
- The 25th Amendment sought to surmount the difficulties placed in the way of **giving effect to the Directive Principles of State Policy**. One of the means employed to do so was the introduction of **Article 31C**.

The Journey of Article 31C -

- **The 25th amendment was challenged** in the **Kesavananda Bharati case (1973)** in which 13 judges held by a narrow 7-6 majority that the Constitution has a “**basic structure**” that cannot be altered, even by a constitutional amendment.
- As a part of this verdict, **the court struck down the last portion of Article 31C**, which states that no law giving effect to DPSP shall be called in question in any court on the ground that it does not give effect to such policy.
 - **This opened the door for the court to examine laws** that had been enacted to further Articles 39(b) and 39(c).
- **In 1976**, Parliament enacted the Constitution (42nd) Amendment Act, which expanded the protection under Article 31C.
 - As a result, **every single directive principle (Articles 36-51)** was protected from challenges under Articles 14 and 19 of the Constitution.
 - **It was meant to give precedence to the directive principles** over those fundamental rights which hinders socio-economic reforms for implementing the directive principles.
- **In 1980**, in the **Minerva Mills v. Uoi case**, the SC struck down the above clause of the 42nd amendment.
 - The five-judge Bench held that Parliament’s power to amend the Constitution was limited, and it could not be used to remove these limitations and grant itself “unlimited” and “absolute” powers of amendment.
- **However, the ruling resulted in a conundrum** - By striking down part of the 25th amendment, did the court strike down Article 31C as a whole.

The Ongoing Case in SC -

- The court is hearing a challenge to Chapter VIII-A of the Maharashtra Housing and Area Development Act, 1976 (MHADA).

- This chapter, introduced by an amendment in 1986, **allows the government to acquire “cessed” properties** in Mumbai, citing the obligation under Article 39(b) of the Constitution.
- **In 1991**, the Bombay High Court upheld the amendment, citing the protection granted by Article 31C to laws enacted in furtherance of Article 39(b).
- **This decision was appealed at the SC in 1992**, where the question eventually became whether “material resources of the community” under Article 39(b) included private resources such as cessed properties.

What are the Arguments in the SC?

- **When the hearing began**, the 9-judge Bench seemed to agree with the Centre’s submission that the case should be restricted to interpreting Article 39(b).
- However, the very next day, **the Bench stated that the question of whether Article 31C** still lives following the Minerva Mills decision has to be decided to avoid “constitutional uncertainty”.
- Senior Advocate (appearing for the petitioners) **argued that the original version of Article 31C was ‘substituted’ with the expanded version** provided in the 42nd Amendment.
 - Therefore, when this new Article 31C was struck down in Minerva Mills, the older provision would not automatically be revived.
- **On the other hand**, the Solicitor General (appearing for the Centre) argued that the doctrine of revival must apply in this case, and the post-Kesavananda Bharati position on Article 31C must be restored.
 - To explain the doctrine and justify its application, he relied on Justice Kurian Joseph’s observations in the case where the court struck down **the Constitution (99th) Amendment Act (NJAC)**.
 - Justice Joseph held that once the process of substitution and insertion by way of a constitutional amendment is itself held to be bad and impermissible, **the pre-amended provisions automatically resurface and revive**.

Powers of EC in nominal polling process

The Election Commission of India (ECI), under Sections 58(2) and 58A (2) of the Representation of People Act 1951 (RPA), declared void the poll on April 19 in 19 polling stations of Manipur and Arunachal Pradesh.

Elections were also adjourned in Madhya Pradesh’s Betul Lok Sabha constituency due to the death of a candidate on April 9.

In the first case, repolls were conducted on April 22 and April 24 respectively, and the polling in MP will now be held on May 7 (originally scheduled on April 26).

Framework for Handling Situations where the Normal Polling Process is Disrupted -

- **India’s election laws provide a framework** for handling situations where the normal polling process is disrupted for any reason, including —
 - Damage to EVMs,
 - Booth-capturing,
 - Natural disasters, or
 - A candidate’s death.
- The provisions for repolls, adjournments and the voiding of polls **ensure that the democratic process remains fair, transparent and uninterrupted**.

Circumstances when the Normal Polling Process is disrupted -

- **Intentional destruction, taking away of EVMs —**
 - **Under Section 58 of the RPA** (‘Fresh poll in the case of destruction, etc., of ballot boxes’), the EC can declare the poll at a polling station to be void if:
 - An unauthorised person has unlawfully taken away any EVM;
 - Any EVM has been accidentally or intentionally destroyed, or lost, or damaged, or tampered with; or
 - A mechanical failure develops in any EVM during the recording of votes.
 - In such cases, **the Returning Officer (RO) immediately informs the ECI and the Chief Electoral Officer (CEO)** of the state about the relevant facts and material circumstances.

- After considering this, the ECI can declare the poll void and formally fix the date and time for a new poll.
- During the repoll, **the voters' left middle fingers are inked** to distinguish between the mark made during the original poll (on their left forefinger).
- **Booth capturing —**
 - Booth-capturing, **defined in Section 135A of the RPA**, includes all or any of the following activities by any person or persons —
 - Seizure of a polling station, affecting the conduct of elections;
 - Taking possession of a polling station, allowing only his or their supporters to vote;
 - Intimidating or threatening any elector and preventing him from going to the polling station;
 - Seizure of a counting place affecting the counting of votes;
 - Involvement of any person in government service in any of the above activities.
 - **Booth capturing is punishable** for a term of not less than one year, which may extend to three years for lay people, and not less than three years, extending to five years for government servants.
 - In such case, the ECI, based on the material facts (from Presiding Officer and RO), may —
 - **Declare the poll at that polling station to be void** and direct a fresh poll on a new date; or
 - **Countermand the election in the constituency** in case booth capturing has taken place in a large number of polling stations, or if it has affected the counting of votes.
- **Natural disasters, other disruptions to polling —**
 - The Presiding Officer of a polling station can adjourn the poll at a polling station under **section 57(1) of the Representation of the People Act 1951**, in case of:
 - A natural calamity like a flood, a severe storm;
 - Non-receipt or loss or damage to essential polling materials like EVM, electoral roll etc;
 - Interruption or obstruction due to any riot or, open violence;
 - Non-arrival of the polling party due to obstruction or any other serious difficulty; or
 - Non-commencement of the poll within two hours from the scheduled time due to malfunctioning of EVM, or any other reason.
 - After seeking the ECI's approval on the date and hours, the adjourned poll will recommence from the stage at which it was left immediately before the adjournment.
 - **Only electors** who have not already voted before the poll was adjourned are permitted to vote.
- **Death of a candidate —**
 - **As per Section 52 of RPA** (amended in 1996), the poll shall be adjourned **only in case of the death of a recognised political party's candidate**.
 - The above provision applies if the candidate with a valid nomination dies at **any time after 11.00 a.m. on the last date for making nominations**, until the commencement of the poll.
 - The RO reports the fact to the EC and orders the adjournment of the poll to a date to be notified later by the Commission.
 - The EC then calls upon the concerned political party to nominate another candidate for the said election in place of the deceased candidate.
 - The political party must make the nomination **within seven days**.

Working of Symbol Loading Unit of EVMs

The Supreme Court has rejected the plea for 100% verification of Voter Verifiable Paper Audit Trail (VVPAT) slips against the Electronic Voting Machine (EVM) count. The Court has directed the Election Commission to seal and secure the Symbol Loading Unit (SLU) for 45 days after the declaration of election results.

Currently, only the three components of the EVM - the ballot unit, control unit and VVPAT - are stored for 45 days after the results.

What is a Symbol Loading Unit (SLU) and how does it work?

- Symbol Loading Units (SLUs) were introduced around the same time as VVPATs — a little over a decade ago.

- VVPATs help voters verify their votes – they see a slip with a printed image of the party symbol they voted for.
- But for the VVPAT to print a symbol correctly, information pertaining to the list of candidates and their symbols must be loaded on to the VVPAT machine in the correct order.
- This is where the Symbol Loading Unit, or SLU, comes in. In fact, the introduction of VVPATs necessitated the use of SLUs.
- The **SLU is used to load the symbols of the candidates onto the VVPAT**.
- It is a matchbox-sized device that is first connected to a laptop or personal computer, from where a symbol loading application is used to load a bitmap file containing the candidates' names, serial numbers, and symbols.
- The SLU is then connected to the VVPAT to transfer that file on to the paper audit machine.
- This is **done under the supervision of a district election officer**.

At Which Point in the Election Process are SLUs Used?

- The SLUs come into the picture only a few days before polling in a particular seat, when the EVMs are being commissioned and the list/ order of contesting candidates is decided.
- Candidate-setting can happen at any time from five to two days before voting at a seat.
- Once the SLU is used to load symbols onto the VVPAT, the EVM is ready for use.
- After this, the SLU is of no relevance to the actual voting process.

What happens to an SLU after Symbols are loaded?

- Typically, a small number of SLUs are enough to load symbols onto all VVPATs for a seat.
- According to EC officials, it takes an SLU two to three minutes to load each VVPAT.
- Once the symbol-loading is complete, the SLUs are handed over to the concerned district election officer for safekeeping.
- They remain in the officer's custody until the day after voting.
- Afterward, the SLUs are released to the engineers of the two EVM manufacturers, Bharat Electronics Ltd (BEL) or Electronics Corporation of India Ltd (ECIL), so they can be used to load symbols onto VVPATs for other seats in subsequent phases.
- Thus, in a multi-phase election like the ongoing one for the 18th Lok Sabha, an SLU is typically reused after one phase of polling to load symbols onto VVPATs meant for other seats in subsequent phases.

National Centre for Good Governance

There are bilateral discussions regarding renewal of MoU between National Centre for Good Governance (NCGG) India and Bangladesh Ministry of Public Administration for the period 2024-2029.

About National Centre for Good Governance -

- It is an **autonomous institute** under the aegis of **Department of Administrative Reforms and Public Grievances**, Government of India.
- It has been set up to assist in bringing about **governance reforms** through studies, training, knowledge sharing and promotion of good ideas.
- It seeks to carry out policy relevant research and prepare case studies; curate training courses for civil servants from India and other developing countries.
- **Background —**
 - It traces its origin to the **National Institute of Administrative Research (NIAR)**. NIAR was set up in 1995 by the Lal Bahadur Shastri National Academy of Administration (LBSNAA) the Government of India's apex training Institute for higher civil services.
 - NIAR was subsequently renamed with an expanded mandate, as National Centre for Good Governance, which was inaugurated on February 24th, 2014.
- **Objectives —**
 - To function as a national repository on information on best practices, initiatives and methodologies that **promote Good Governance**, e-Governance etc.
 - To advise on key issues in governance and develop synergy across various Ministries/ Departments of Gol and State Governments;
- **Governing Body —**

- The affairs of the NCGG are managed under the overall superintendence and direction of the Governing Body, which is **headed by the Cabinet Secretary**.
- It has Secretaries of 9 ministries/departments and 5 eminent persons viz. academicians, eminent administrators, specialists, eminent innovators, heads of reputed institutions as members.
- The **Director General**, who is the Chief Executive of NCGG acts as the Member-Secretary of the Governing Body.
- **Head office** — Its head office is at New Delhi and branch office at Mussoorie.

Essential Programme on Immunisation

The year 2024 commemorates 50 years since the launch of the Expanded Programme on Immunisation (EPI) by the World Health Organisation (WHO) in 1974 which is now known as Essential Programme on Immunisation.

About Essential Programme on Immunisation -

- It was launched as the **Expanded Programme on Immunisation (EPI)** by **World Health Organisation** in 1974 to ensure that all children, in all countries, benefited from life-saving vaccines.
- It has evolved into what is now commonly known as the **Essential Programme on Immunisation**.
- Disease covered (Total 13) —
 - Initially this programme focused on protection **against six childhood vaccine-preventable diseases** namely **Bacillus Calmette-Guérin (BCG), diphtheria, pertussis, tetanus, polio, and measles**.
 - Later on WHO added **7 more disease** under this initiative Haemophilus influenzae type B (Hib), Hepatitis B (HepB), rubella, pneumococcal disease (PNC), rotavirus (Rota), human papillomavirus (HPV) and COVID-19 (for adults).

India's Universal Immunisation Programme (UIP) -

- India launched the EPI in 1978, which was later renamed as the **Universal Immunisation Programme (UIP)** in 1985.
- Objectives —
 - To rapidly increase immunisation coverage.
 - To improve the quality of services.
 - To establish a reliable cold chain system to the health facility level.
 - Monitoring of performance.
 - To achieve self-sufficiency in vaccine production.
- Eligibility —
 - All beneficiaries' namely **pregnant women and children** can get themselves vaccinated at the nearest Government/Private health facility or at an immunisation session site (Anganwadi centres/ other identified sites) near to their village/urban locality on fixed days.
 - The UIP covers all sections of the society across the country with the same high quality vaccines.
- Under UIP, immunisation is providing free of cost against **12 vaccine preventable diseases**.
- **Nationally against 9 diseases** — Diphtheria, Pertussis, Tetanus, Polio, Measles, Rubella, severe form of Childhood Tuberculosis, Hepatitis B and Meningitis & Pneumonia caused by Hemophilus Influenza type B.
- **Sub-nationally against 3 diseases** — Rotavirus diarrhoea, Pneumococcal Pneumonia and Japanese Encephalitis; of which Rotavirus vaccine and Pneumococcal Conjugate vaccine are in process of expansion while JE vaccine is provided only in endemic districts.

Project ISHAN

India has kickstarted the process of unifying its four airspace regions into one spanning the entire nation under Project ISHAN.

About Project ISHAN -

- The **Indian Single Sky Harmonised Air Traffic Management** (ISHAN) initiative aims to streamline and enhance air traffic management.
- India is planning a major move to unify its four Flight Information Regions (FIRs) in Delhi, Mumbai, Kolkata and Chennai into one continuous airspace in **Nagpur** and have harmonised Air Traffic Management from Nagpur.
- The **Airports Authority of India** (AAI), the public entity invited expressions of interest (EoI) for the preparation of a detailed project report.
- **What is the arrangement at present?**
 - Currently, Indian airspace is divided into **four flight information regions** (FIRs) in **Mumbai, Kolkata, Delhi, Chennai**, and a sub-FIR in Guwahati each managed separately.
- **Significance** — It is expected to streamline operations, enhance capacity, and alleviate congestion, benefiting both airlines and passengers.

About Airports Authority of India -

- It is a **statutory body** under the **Directorate General of Civil Aviation**, Ministry of Civil Aviation, Government of India.
- It was constituted by an Act of Parliament and came into being on 1st April 1995, by merging the erstwhile National Airports Authority and the International Airports Authority of India.
- It is entrusted with the responsibility of **creating, upgrading, maintaining, and managing civil aviation infrastructure** both on the ground and in air space in the country.
- It also provides **Air Traffic Management Services** (ATMS) over the entire Indian Air Space and adjoining oceanic areas, with ground installations at all airports, and 25 other locations to ensure the safety of aircraft operations.

Eggshell Skull Rule

Underlining that the state and central consumer courts incorrectly applied the ‘eggshell skull’ legal principle, the Supreme Court restored the compensation of Rs 5 lakhs awarded by the district consumer forum in a medical negligence case.

About Eggshell skull rule -

- It is a common law principle **applied in civil litigation**. It states that all **victims should be fully compensated** for their losses, even in situations where the victim was more-susceptible to injury due to a **predisposing condition or preexisting injury**.
- It ensures that a **defendant** (the person being sued) cannot escape liability for exacerbating a pre-existing condition due to their negligence.
- The eggshell skull doctrine is named after a hypothetical situation where a person with a fragile skull, akin to an eggshell, suffers a head injury.
 - If the victim’s skull fractures more easily than the average person, the defendant is still fully liable for all resulting damages, despite the victim’s unusual vulnerability.
- Despite its name, the eggshell skull rule applies to all types of injuries, including physical, emotional, and psychological harm.
- The rule is applied for **claiming an enhanced compensation** – for damage that is more than what could have been ordinarily anticipated to be caused by the defendant.
- The eggshell skull rule has consequently also been referred to as the **‘thin skull rule’** in many of the cases.
- **Origin** — The origins of the eggshell skull rule are most often traced back to an 1891 **Vosburg v. Putney case in Wisconsin, US**.

VVPAT

As the country votes for 2024 Lok Sabha election, the SC has given Electronic Voting Machines (EVMs), a big vote of confidence.

What has SC Ruled?

Presently, the Election Commission of India (ECI) conducts random matching of Voter Verifiable Paper Audit Trail (VVPAT) slips with EVMs at five polling booths per assembly constituency. A two-judge bench **rejected petitions seeking 100% verification of votes cast on EVMs using the VVPAT**. However, the court issued two directions to the ECI in this regard.

What is the SC's First Direction?

The court gave directions to the ECI **to seal and store the symbol loading units (SLUs)** for 45 days after declaration of results. **SLUs** are memory units that are first connected to a computer to load election symbols onto it, and then used to enter symbols of the candidates on the VVPAT machines.

What is the SC's Second Direction?

The SC has **enabled candidates to seek verification of the EVMs** - again a first. The burnt memory in the EVM microcontroller must be checked by a team of engineers - after results are declared - if candidates (placed 2nd and 3rd in the election) make such a request (within 7 days of declaration of results). **The expenses for this verification will have to be borne by the candidate** (which would be refunded in case the EVM is found to be tampered with).

SC's Suggestion on VVPAT -

The ECI may examine the suggestion that **VVPAT slips can be counted using a counting machine**, rather than by humans. VVPAT slips could have a **barcode** printed on them, making it easier for machine counting.

Key Takeaways from the SC's Verdict -

The apex court reposed faith in the electoral process, saying '**blindly doubting a system can breed skepticism**'. However, its directives and suggestions attempt to ensure that India's electoral process remains full proof.

Look Out Circulars

The Bombay High Court recently held that public sector banks (PSBs) cannot recommend or request the issuance of Look Out Circulars (LOCs) against loan defaulters.

About Look Out Circulars (LOCs) -

- It is an instrument issued by the government as a **directive to its immigration authorities to restrict** and regulate the **physical movement of a person**.
- The **immigration department is tasked to stop** any **such individual** against whom such a notice exists **from leaving or entering the country**.
- Law enforcement agencies often use LOCs as a coercive measure to stop any individual wanted or under suspicion by the police or an investigating agency from leaving or entering the country **through designated land, air, and sea ports**.
- LOCs are usually issued by the police, intelligence agencies, or other government agencies authorised by the **Ministry of Home Affairs (MHA)**.
- LOC **does not have express statutory backing** in legislation, the power to issue LOCs and their regulation stems from the executive in the form of an Office Memorandum issued by the MHA in 2021, which provides consolidated guidelines for opening LOCs against Indian citizens or foreigners.
- **Guidelines —**
 - The guidelines categorically provide that LOCs can **only be opened in criminal or penal cases**, and the reason for the LOC must be indicated with the issue of the circular.
 - **If there is no criminal or penal case** pending, the LOC cannot be issued, and **agencies can only request that they be informed of departure or arrival**.
 - However, the guidelines provide that **in exceptional cases**, an LOC may be issued against an individual even when the case is not a criminal case. This is in specified circumstances, such as when it is detrimental to the "sovereignty, or security, or integrity of India", the "bilateral relations with any State", or to the "strategic and economic interests of India".

- LOCs are also **permitted in cases** where the individual is likely to engage in terrorism or offences against the State or when such departure would not be “in the larger public interest”.
- LOCs **cannot be issued unless basic details** – including name/parentage, passport number, and date of birth – **are available**, and such requests must be constantly monitored.
- It is the **responsibility of the originator to constantly review the LOC requests** and proactively provide additional parameters to minimise harassment to genuine passengers.
- It is also required that any **LOC issued must be reviewed on a quarterly and annual basis by agencies that request** such restrictions, and the result of the review must be **informed to the MHA**.
- **MHA** has categorically **transferred the legal consequences** of issuing an LOC **to the originating agency**, even though such OMs are issued by the Bureau of Immigration.
- **The power to issue** such OMs and LOCs is **sourced from The Passports Act, 1967**, the key legislation for the grant of passports, travel documents, and “endorsements” to travellers at the time of emigration or immigration.

NOTA

The Supreme Court recently issued a notice to the Election Commission on a plea calling for fresh elections in a constituency where the 'none of the above' option on the EVM gets the maximum votes.

About NOTA (None of the Above) -

- It is a **ballot option** that a voter can choose to apply for instead of giving their vote to any of the contesting candidates.
- It empowers the electors to **express their negative opinions** and a lack of support for the contenders. It gives them the right to reject while maintaining the secrecy of their decision.
- **When was it first used?**
 - It was used for the first time in the **2013 Assembly elections in five states**-Chhattisgarh, Mizoram, Rajasthan, Delhi and Madhya Pradesh-and later in the 2014 General Elections.
 - It was introduced into the electoral process following the **2013 Supreme Court directive** in the PUCL versus Union of India case.
- **How does a person cast a NOTA vote?**
 - The NOTA option in the Electronic Voting Machines (EVMs) is **given at the bottom** of the candidates' list.
 - Earlier, in order to cast a negative ballot, a voter had to inform the presiding officer at the polling booth. Now the voter has just to press the NOTA option on the EVM.
- **Does NOTA Vote Count?**
 - The Election Commission clarified that votes cast as NOTA are counted, but are **considered 'invalid votes'**.
 - Even if NOTA votes get the most number of votes in a constituency, the next candidate with the second-most number of votes is declared the winner.
 - Therefore, votes made to NOTA **will not change the outcome of the election**.

Central Pay Commission

The Department of Personnel & Training (Do&PT) has forwarded a letter from the Indian Railways Technical Supervisors' Association to the Department of Expenditure regarding the formation of the 8th Central Pay Commission for the further action.

About Central Pay Commission -

- It is a body **set up by the Central government** that reviews and recommends changes to the salary structure of the employees. It also reviews the bonuses, allowances and other benefits of the employees.
- It recommends changes for central government employees and pensioners as well as the defence forces.

- They are **usually constituted every 10 years** and the first pay commission was set up in 1946. Since Independence, a total of seven pay commissions have been formed.
 - The latest pay commission was set up in 2014 and its recommendations came into effect in 2016.
- It is **not mandatory** for the government to accept the recommendations of the pay commission and it may choose to accept or reject the recommendations.
- The **Department of Expenditure** under the Ministry of Finance is responsible for the implementation of the recommendations of the Central Pay Commission.

Booth Capturing

Booth Capturing during elections in India is a 'Corrupt Practice' Under the Representation of People Act, 1951 (RPA).

About Booth Capturing -

- Booth-capturing, defined in **Section 135A of the RPA**, includes all or any of the following activities by any person or persons:
 - **Seizure of a polling station**, affecting the conduct of elections;
 - **Taking possession of a polling station**, allowing only his or their supporters to vote;
 - Intimidating or threatening any elector and preventing him from going to the polling station;
 - Seizure of a counting place affecting the counting of votes;
 - Involvement of any person in government service in any of the above activities.
- It is **punishable** for a term of **not less than one year**, which may extend to three years for lay people and not less than three years, extending to **five years for government servants**.
- In such cases the Election Commission of India, based on the material facts, may –
 - Declare the poll at that polling station to be void and **direct a fresh poll** on a new date; or
 - Countermand the election in the constituency in case booth capturing has taken place in a large number of polling stations, or if it has affected the counting of votes.

Target Olympic Podium Scheme

Former world number one archer Deepika Kumari has been re-inducted into the Target Olympic Podium Scheme (TOPS) core group ahead of the Paris Games.

What is TOPS?

The TOPS was launched by the Union Ministry of Youth Affairs and Sports in **2014** (and revamped in 2018). It aims to **improve India's performance at the Olympics and Paralympics** and it receives funding from the National Sports Development Fund (NSDF) and the Khelo India scheme. A committee called the **TOPS Elite Athletes' Identification Committee** was constituted to shortlist worthy candidates and provide targeted training. This Committee formed the first **Mission Olympic Cell (MOC)**. The MOC, which meets on a weekly basis, has a selection and review committee to shortlist TOPS athletes based on their performance.

How Target Olympic Podium Scheme benefits Indian Athletes? Under this scheme, athletes and sportspersons will get **customised training from top coaches** at modern and well-equipped sports facilities and institutions. They are also given **assistance for buying sport-specific equipment** and are provided with **support staff** such as physiotherapists, sports psychologists, physical trainers, etc. Additionally, the selected athletes and sportspersons are also given an **out-of-pocket allowance** of a certain sum as an incentive.

What is the Progress under TOPS?

Recording its best-ever performance at the **2021 Tokyo Olympics**, India won seven medals. **Neeraj Chopra** bagged India's first Olympic gold in athletics at the men's javelin throw event, while ace shuttler **P.V. Sindhu** created history by winning the bronze (first Indian woman to win 2 individual Olympic medals). **The Indian men's hockey team won the bronze medal**, ending the nation's 41-year Olympic medal drought in hockey. **The Paralympics team bagged 19 medals at**

the Tokyo Paralympic Games – India’s highest tally in a single edition and higher than the cumulative total of all medals won till then.

ECONOMICS

Payment Aggregators

The Reserve Bank of India (RBI) had floated two consultation papers earlier this month to seek better regulation of offline Payment Aggregators (PAs). The first deals with activities of offline PAs, while the second proposes to strengthen the ecosystem’s safety by expanding instructions for Know Your Customer (KYC), due diligence of onboarded merchants and operations in Escrow accounts. The RBI had invited comments/feedback by May 31.

Who are Payment Aggregators?

- Payment aggregators (Pas) are entities that facilitate online transactions by collecting payments from customers on behalf of merchants.
- They act as intermediaries between the buyer, the seller, and the payment gateway.
- Working of PAs –
 - **Collect Payments** — Payment aggregators collect payments from customers using various payment methods like credit/debit cards, net banking, digital wallets, etc.
 - **Transfer Funds** — Once the payment is collected, the aggregator transfers the funds to the merchant after deducting their service fees or commission.
 - **Settlement** — The aggregator ensures that the funds are settled in the merchant's bank account within a specified time frame, which is usually a few days.
 - **Security** — Payment aggregators ensure the security of transactions by using encryption and other security measures to protect sensitive customer information.
 - **Integration** — They offer APIs and plugins that merchants can integrate into their websites or mobile apps to easily accept payments.
- Popular payment aggregators include companies like **Razorpay**, **Paytm** and **PayPal** in India.
- They play a crucial role in enabling businesses to accept payments online, thereby facilitating e-commerce and online transactions.

What exactly are the RBI’s Draft Rules about?

- The existing guidelines cover their activities in e-commerce sites and other online avenues.
- The latest draft guidelines propose to extend these regulations to offline spaces, entailing proximity or face-to-face transactions.
- RBI observed back in June 2022 that the nature of activities carried out by the PAs, both online and offline, is similar.
- It aspires to bring in “synergy in regulation covering activities and operations of PAs apart from convergence on standards of data collection and storage.”
- The proposed norms are elaborate and incorporate lessons from what happened this year with **Paytm Payments Bank (PPBL)**.
 - The PPBL crisis was triggered by, among other things, major irregularities in the bank’s KYC adherence.
 - In fact, the Financial Intelligence Unit (FIU-IND) had imposed a penalty of ₹5.49 crore having found that PPBL “engaged in a number of illegal acts, including organising and facilitating online gambling.”
- With expansion of the utility and scope of operations of PAs, RBI appears to be strengthening the ecosystem against any such opacity.

Is registration with RBI being made mandatory?

- The primary focus here is on non-bank PAs and within them, the offline extensions.
- Banks providing physical PA services as part of their normal banking relationship would not require any separate authorisation from the RBI.
- They are **only expected to comply with the revised instructions within three months after they are issued.**

- PAs, providing online / offline services, would have to inform RBI within 60 days (after the circular is issued), about their intent to seek authorisation.

Does the draft rules talk about Provisions for Sustainability?

- RBI proposes that non-banking entities currently providing proximity/face to face transaction services have a minimum net worth of ₹15 crore when they apply.
- This would be extended to ₹25 crore by March 31, 2028.
- The requirements are the same for new applicants, the difference being that a ₹25 crore net worth requirement would apply at the end of three financial years when the authorisation is granted.
- RBI has proposed that existing offline operators unable to comply with the approval-seeking timeframe wind-up their operations by July 31, 2025.
- Banks will also be directed to close all accounts by the end of October next year should they fail to produce evidence of their application seeking authorisation.

Provisions for KYC Requirements -

- The purpose of the proposed regulations is to ensure that onboarded merchants do not collect and settle funds for services not offered on their platforms.
- While KYC is already mandatory, the regulations seek to extend the scope and make the provisions more nuanced.
- RBI's proposed instructions categorise merchants into small and medium merchants.
- **Small merchants** would constitute physical merchants with an annual business turnover of less than ₹5 lakh who are not registered under the Goods and Services Tax (GST) regime.
- The regulator proposes that the PAs undertake 'contact point verification', that is, collect information physically to establish the existence of the firm.
- They must also verify the bank accounts in which their funds are settled.
- **Medium merchants**, defined as physical or online merchants with annual business turnover of less than ₹40 lakhs who are not registered under GST, would also have to undergo contact point verification.
- The PA would be expected to establish their existence by verifying one official document each of the proprietor, beneficial owner or attorney holder, and of the stated business.

Provisions for Data Privacy -

- The draft regulations instruct that no entity, other than the card issuer and/or card network, can store data for proximity/face to face payments from August 1, 2025, and direct them to purge data stored previously.
- To track transactions and to reconcile them, entities would be allowed to store limited data, that is, the last four digits of the card number and the issuer's name.
- The onus for compliance in this domain would also be on card networks.

Performance of rupee over the last 10 years

Between April-end 2014 and now the rupee has depreciated by 27.6% against the US dollar, from Rs 60.34 to Rs 83.38. This is marginally higher than the 26.5% from April-end 2004 to April-end 2014, when the rupee fell from 44.37 to 60.34 to the dollar.

How is the strength or weakness of the Rupee decided?

- **India trades not only with the US.** It exports goods and services to other countries as well, while also importing from them.
- Hence, the strength or weakness of the rupee is **a function of its exchange rate with not just the US dollar, but also with other global currencies.**
- It is calculated by what is called the **rupee's effective exchange rate (EER).**

What is the EER?

- The EER is measured by an index similar to the **consumer price index (CPI).**
 - The CPI is the weighted average retail price of a representative consumer basket of goods and services for a given month or year, relative to a fixed base period.

- **The EER is an index** of the weighted average of the rupee's exchange rates vis-à-vis the currencies of India's major trading partners.
- **The currency weights** are derived from the share of the individual countries to India's total foreign trade, just as the weights for each commodity in the CPI are based on their relative importance in the overall consumption basket.

What are the two measures of EER?

- **Nominal EER (NEER) —**
 - **The Reserve Bank of India (RBI)** has constructed NEER indices of the rupee against a basket of six and also of 40 currencies.
 - **The former** is a trade-weighted average rate at which the rupee is exchangeable with a basic currency basket, comprising **the US dollar, the euro, the Chinese yuan, the British pound, the Japanese yen and the Hong Kong dollar.**
 - **The latter** index covers a bigger basket of 40 currencies of countries that account for **about 88% of India's annual trade flows.**
 - The NEER indices are with reference to a base year value of **100 for 2015-16**: Increases indicate the rupee's effective appreciation against these currencies and decreases point to overall exchange rate depreciation.
 - While the NEER is a summary index **that captures movements in the external value of the Rs** (against a basket of global currencies), the NEER does not factor in inflation (reflects changes in the internal value of the Rs).
- **Real EER (REER) —**
 - The REER is basically the **NEER that is adjusted for the inflation differentials** between the home country and its trading partners.
 - If a country's nominal exchange rate falls less than its domestic inflation rate - as with India - the currency has actually appreciated in "real" terms.

What the NEER and REER data shows?

- **NEER —**
 - The rupee's 40-currency basket NEER has fallen by around 32.2% (from 133.8 to 90.8) between 2004-05 and 2023-24.
 - The decline is even more - 40.2%, from 139.8 to 83.7 - for the narrower 6-currency basket NEER.
 - During the same period, the rupee's average exchange rate against the US dollar dropped by 45.7%, from Rs 44.9 to Rs 82.8.
 - **Simply put, the rupee's "effective" depreciation of 32.2-40.2% against the 40-currencies has been lower than its corresponding depreciation of 45.7% against the US dollar.**
 - The reason for that is its weakening less relative to other currencies than vis-à-vis the dollar.
- **REER —**
 - **The rupee has strengthened in real terms over time**, while ruling at 100 or above in 9 out of the last 10 years.
 - This is opposite to the trend of weakening if one takes only the rupee's NEER or its exchange rate with the US dollar.
 - Any increase in REER means that the costs of products being exported from India are rising more than the prices of imports into the country.
 - **That translates into a loss of trade competitiveness** - which may not be quite a good thing in the long run.

[Critical Minerals Summit](#)

The Ministry of Mines will hold a two day "Critical Minerals Summit: Enhancing Beneficiation and Processing Capabilities" in New Delhi.

About Critical Minerals Summit -

- It is **organised by the Ministry of Mines**, Government of India, in collaboration with the Shakti Sustainable Energy Foundation (Shakti), the Council on Energy, Environment and Water (CEEW) and the Indian Institute of Sustainable Development (IISD).
 - It is designed to foster collaboration, share knowledge, and drive innovation in the field of critical mineral beneficiation and processing.
- It will bring together a diverse array of **Indian and international stakeholders**, including industry leaders, startups, government officials, scientists, academics and policy experts.
- It will address the increasing demand for **Critical Raw Materials (CRMs)** required for renewable energy systems and electric vehicles as part of India's strategic development goals.
- The **Ministry of Mines** has **identified eight key minerals for focus** at the summit, including Glauconite (Potash), **Lithium - Rare Earth Elements** (Laterite), **Chromium**, Platinum Group, Graphite, Tungsten associated with Graphite, **Rare Earths** (RE) and Vanadium associated with Graphite.

Key Facts about Critical Minerals -

- It is a **metallic or non-metallic** element that has two characteristics.
 - It is essential for the functioning of our modern technologies, economies or national security and
 - There is a risk that its supply chains could be disrupted.
- The '**criticality**' of minerals changes with time as supply and society's needs shift.
- **Applications —**
 - They are used to manufacture **advanced technologies**, including mobile phones, computers, fibre-optic cables, semiconductors, banknotes, and defence, aerospace and medical applications.
 - Many are used in **low-emission technologies**, such as electric vehicles, wind turbines, solar panels, and rechargeable batteries.
 - Some are also crucial for **common products**, such as stainless steel and electronics.
- **Examples —** antimony, beryllium, bismuth, cobalt, copper, gallium, germanium, lithium, vanadium, etc.
- **Top Producers —** Chile, Indonesia, Congo, China, Australia and South Africa.
- **Critical Minerals in India —**
 - Government has released a **list of 30** critical minerals for India.
 - These minerals are Antimony, Beryllium, Bismuth, Cobalt, Copper, Gallium, Germanium, Graphite, Hafnium, Indium, Lithium, Molybdenum, Niobium, Nickel, PGE, Phosphorous, Potash, REE, Rhenium, Silicon, Strontium, Tantalum, Tellurium, Tin, Titanium, Tungsten, Vanadium, Zirconium, Selenium, and Cadmium.

Small Finance Bank

The Reserve Bank of India (RBI) has said Small Finance Banks (SFBs) should have a minimum net worth of Rs 1,000 crore to become universal banks in accordance with the on-tap licensing norms.

About Small Finance Banks (SFBs) -

- They are specialised banks that are licensed by RBI to provide **financial services** and products to **low-income individuals** and **underserved communities**, including micro-finance and micro-enterprise services, as well as other basic banking services.
- They are granted the **scheduled bank status** after being operational and are deemed suitable **under section 42 of the RBI Act, 1934**.
- **Objectives —**
 - To provide **financial inclusion** to these segments of the population who are often excluded from the traditional banking system.
 - To provide **financial products** such as small loans, savings, insurance and other basic banking services.
- **Eligibility —**
 - **Resident individuals/professionals** (Indian citizens), singly or jointly, each having at least **10 years of experience** in banking and finance at a senior level are eligible for SFBs.

- Companies and Societies in the private sector, that is owned and controlled by residents and having successful track record of running their businesses for at least a period of five years.
- Existing **Non-Banking Finance Companies** (NBFCs), Micro Finance Institutions (MFIs), and **Local Area Banks** (LABs) in the private sector, that are controlled by residents and having successful track record of running their businesses for at least a period of five years, can also opt for conversion into small finance banks after complying with all legal and regulatory requirements of various authorities.
- Other norms to be followed by SFBs —
 - **Capital to Risk Weighted Assets Ratio** — They are required to maintain a minimum CRAR of 15%.
 - **Priority Sector Lending** — They are required to extend 75% of their Adjusted Net Bank Credit to Priority Sector Lending.
 - They are required to open at **least 25%** of their total branches in unbanked rural areas.
 - **Required paid up capital** — The minimum paid-up voting equity capital for small finance banks shall be **200 crore**.
- Regulation — They are registered as public limited companies under the **Companies Act, 2013** and governed by **Banking Regulations Act, 1949; RBI Act, 1934** and other relevant Statutes and Directives from time to time.

Asset Reconstruction Companies

The Reserve Bank of India (RBI) recently released a master direction for Asset Reconstruction Companies (ARCs).

About Asset Reconstruction Companies (ARCs) -

- It is a **specialised financial institution** that **purchases** the **bad debts** of a bank at a mutually agreed value and attempts to recover those debts or associated securities by itself.
- They are **registered under the RBI** and **regulated under** the Securitisation and Reconstruction of Financial Assets and Enforcement of Securities Interest Act, 2002 (**SARFAESI Act, 2002**). They function under the supervision and control of the RBI.
- As per the RBI, ARC performs the functions namely Acquisition of financial assets, Change or takeover of Management or Sale or Lease of Business of the Borrower, Rescheduling of Debts, Enforcement of Security Interest and Settlement of dues payable by the borrower.
- They **take over** a portion of the **bank's debts**, which qualify as Non-Performing Assets (**NPA**s). Therefore, ARCs are involved in the business of asset reconstruction, securitisation, or both. All the rights previously held by the lender (the bank) in regard to the debt are transferred to the ARC.
- The **required funds** to purchase such debts can be **raised from Qualified Buyers**.
- Qualified Buyers **include Financial Institutions, Insurance companies, Banks**, State Financial Corporations, State Industrial Development Corporations, trustee or ARCs registered under SARFAESI and **Asset Management Companies** registered under SEBI that invest on behalf of mutual funds, pension funds, FIs, etc.
- The Qualified Buyers are the only persons from whom the ARC can raise funds.

Asset Reconstruction vs. Securitisation -

- **Asset Reconstruction** refers to the acquisition of any right or interest of a bank or financial institution in loans, advances, debentures, bonds, guarantees, or any other credit facility extended by banks for the purpose of recovering the funds.
 - These loans, advances, bonds, guarantees, and other credit facilities are collectively referred to as 'financial assistance.'
- **Securitisation**, on the other hand, means the acquisition of financial assets through the issuance of security receipts to Qualified Buyers or other means. These security receipts represent an undivided interest in the financial assets.

Authorised Economic Operator Programme

The Centre has extended Authorised Economic Operator (AEO) status to the gem and jewellery sector.

About Authorised Economic Operator (AEO) Programme -

- An **AEO** is a **business entity** involved in the international movement of goods requiring compliance with provisions of the national customs law.
- It is approved by or on behalf of the national administration in compliance with the **World Customs Organization (WCO)**.
 - The **WCO** in June, 2005, with a view to secure the international supply chain, adopted the **SAFE Framework of Standards (WCO SAFE FoS)**. It is the basis of the Indian AEO programme.
- **AEO** is one of the three pillars on which the SAFE FoS is formed. It helps to build a closer partnership between the customs department and the trade industry.
- What is the AEO programme?
 - It was introduced in India by the **Central Board of Indirect Taxes and Customs (CBIC)** in 2011. It is a **voluntary programme** administered by the CBIC.
 - It seeks to provide benefits in the form of **simplified customs procedures** and faster customs clearances to those business entities that offer a high degree of security guarantees regarding their role in the supply chain.
 - Thus, an entity with an **AEO status** can be **considered a reliable trading partner** and a secure trader.
 - This segmentation approach enables customs resources to focus on less-non-compliant or risky businesses for control.
- Benefits —
 - **Direct port delivery** in the case of import and **direct port entry** in case of export;
 - **Small and medium scale entities** would be given special focus. It must be noted that any entity handling up to 25 import and export documents annually can become part of the AEO programme;
 - Easy and **fast disbursement of the drawback amount**;
 - Easy and **fast disbursement of refunds** and adjudications;
 - **Paperless declaration** with no supporting documents;
 - Site inspection or examination possible on request;
 - **Recognition by partner Government agencies** and other stake holders.
- Who can apply for AEO Status?
 - **Business entities** who are involved in the international supply chain that undertakes customs-related activity in India can apply for AEO status. The business entity can apply for AEO status **irrespective of its size**.
 - Some of the **examples** of business entities that can apply for AEO status are importers, exporters, Custom House Agent (CHA), Custodians or Terminal Operators, etc.

Paradox of Savings

The paradox of savings argues that a rise in individuals' savings can, in effect, cause a significant fall in overall savings and investment.

About the Paradox of Savings -

- It is also known as the **paradox of thrift**. It refers a **rise in the savings rate of individuals** can surprisingly **cause a fall** rather than a rise **in the overall savings in an economy**.
- This is in contrast to the general belief that a rise in individuals' savings rates will cause a rise in overall savings in the economy. So even though savings may be good for an individual household, it is believed that it may not be good for the wider economy.
- The idea is **part of the under-consumption theories** of the business cycle, which attribute economic downturns to weak consumption and high savings.
- Origins of the theory —
 - The concept was popularised by British economist **John Maynard Keynes** in his 1936 book, *The General Theory of Employment, Interest and Money*.

- Keynesian economists believe that **higher savings is bad** for the wider economy and that **boosting consumer spending** is the **way to grow an economy**.
- They argue that **savings are invested by capitalists** with the ultimate aim of selling their output in the form of final goods and services to consumers.
- So, **if consumers fail to spend** enough money on the output that capitalists bring to the market to sell, it can cause losses for capitalists and discourage further investment.
- On the other hand, a **rise in consumer demand** for final goods and services is expected to encourage people to save more and invest.
- Criticisms of the idea —
 - Critics of the idea argue that saving more is not bad for the economy and that a **fall in consumer spending** does **not actually cause a fall in investment**.
 - In fact, they argue that a fall in consumer spending leads to a rise in savings and investment.
 - This is simply because any money that people don't spend on consumer goods or hoard under their beds has to go towards their savings, which in turn gets invested.
 - An increase in savings **allows banks to lend more**. This will make interest rates go down and lead to an increase in lending and, therefore, spending.

Lending Service Providers

The Reserve Bank of India (RBI) recently issued the draft regulatory framework for loan products aggregated by lending service providers to ensure transparency for borrowers.

About Lending Service Providers (LSPs) -

- They are **engaged by** the **Regulated Entities** (REs) (banks or NBFCs) to carry out some functions of RE in connection with **lenders' functions on digital platforms**. They offer their services to REs for a fee or commission.
- **RBI defines** an LSP as an **agent of an RE** that carries out one or more **functions of the lender, including customer acquisition, underwriting support**, pricing support, disbursement, servicing, monitoring, collection, and loan recovery on behalf of the RE.
- In simple terms, **LSPs are loan aggregators** which provide loans from their partner REs. In some cases, a RE can also act as an LSP.
- They are **technology-centric entities** which have the client reach and are thus capable of offering a marketplace for both lenders and borrowers.
- LSPs **entail aggregation of loan offers** from multiple lenders on an electronic platform, which **enables the borrowers to compare and choose the best** available option to avail a loan from one of the available lenders.

Navratna Status

Recently, Indian Renewable Energy Development Agency public sector undertaking company was granted 'Navratna status' from the department of public enterprises.

About Navratna status -

- The government categorises all Public Sector Undertakings (PSUs) into three categories, namely **Maharatna, Navratna, and Miniratna**.
- The Government had introduced the 'Navratna' scheme in 1997.
- Criteria for Navratna status —
 - A PSU should be a **Miniratna-I, Schedule 'A'** company, should have obtained an 'excellent' or 'very good' MoU rating in three of the last five years, and must have a composite score of 60 in six performance indicators.
 - It must report a **net profit** of more than **Rs 5,000 crore for three consecutive years**, and maintain an **average annual turnover** of **Rs 25,000 crore** for three years, or have an **annual average net worth** of over Rs 15,000 crore for three years.
- Benefits —
 - **Financial Independence —** They invest up to **₹1,000 crore** without seeking approval from the central government.

- Navratna companies are also allowed to invest up to **15% of their net worth on a single project**, or 30% of their net worth in a given year, subject to a cap of ₹1,000 crore.
- To incur capital expenditure on purchase of new items or for replacement, without any monetary ceiling.
- To enter into technology joint ventures or strategic alliances.

Kutch Ajrakh

Recently, the Controller General of Patents, Designs, and Trademarks (CGPDTM) has bestowed the Geographical Indication (GI) certificate upon the traditional artisans of 'Kutch Ajrakh,' hailing from the vibrant region of Kutch in Gujarat.

About Kutch Ajrakh -

- The Ajrakh is a **textile craft**, holds deep roots in the cultural tapestry of Gujarat, particularly in the regions of Sindh, Barmer, and Kutch, where its legacy spans millennia.
- The art of Ajrakh entails a meticulous process of **hand-block printing on treated cotton cloth**, culminating in intricate designs infused with rich symbolism and history.
 - Ajrak's nomenclature originates from '**Azrak**', **meaning indigo**, a well-known substance most often employed as a powerful dye to achieve a bluish effect.
 - Ajrakh prints have traditionally consisted of **three colors: blue** which signifies the sky, **red** which signifies the land and the fire, and **white** which signifies the stars.
- Textiles are treated with **vegetable and mineral colours** and the fabric goes through a washing cycle about eight times.
- This craft was **introduced** to this region over 400 years back by **the Sind Muslims**.
- Nomadic pastoralist and agricultural communities like the Rabaris, Maldharis, and Ahirs wear Ajrakh printed cloth as turbans, lungis, or stoles.

Refund Borrowers Overcharged Interest

Reserve Bank of India (RBI) has come across instances where lenders charged excess interest from borrowers using unfair practices.

What are these Unfair Practices?

Charging interest from date of loan sanction or execution of loan agreement, and not from the date of actual disbursement of funds; In case of loan disbursement through cheque, interest was charged from cheque date whereas cheque was handed over to customer several days later; In case of disbursement or repayment of loans, some banks were charging interest for entire month, instead of the loan outstanding period; collecting one or more advance instalments but reckoning full loan amount for charging interest.

Latest RBI Directive -

Banks and NBFCs should review their practices regarding loan disbursement mode, application of interest and other charges, take corrective action, including system level changes and refund excess interest and other charges to customers.

RBI Policy on Interest Rate -

Guidelines on Fair Practices Code (2003) issued to various Regulated Entities (REs) like banks and NBFCs, advocate fairness and transparency in charging interest while providing adequate freedom to banks for their loan pricing policy.

Are borrowers informed about Interest Rate Changes?

No, when loan is sanctioned, banks are supposed to clearly communicate to borrowers about possible impact of change in benchmark interest rate on the loan leading to changes in EMI and/or tenor or both. Any increase in EMI/tenor or both should be communicated to borrower immediately. At the time of reset of interest rates, REs should provide the option to borrowers to switch over to a fixed rate as per their Board approved policy and inform the number of times the switch can be made during the loan tenor. However, these norms are not often practiced by banks.

Bima Vistaar

The Insurance Regulatory and Development Authority of India (IRDAI) has proposed to price Bima Vistaar at Rs 1,500 per policy. Bima Vistaar is an ambitious all-in-one affordable **mass product** aimed at the rural areas of the country.

Insurance penetration in India - Statistics -

- In the financial year 2022-23 (FY23), India's overall insurance penetration was down at **4 per cent** from the level of 4.2 per cent in FY22.
 - This is much below the global insurance penetration of 6.8 per cent.
- As per IRDAI, the insurance density increased from \$78 in 2020-21 to \$91 in 2021-22. In FY23, it increased to \$92.
 - Insurance density is a key measure of a country's insurance sector development.
 - It is calculated by dividing the total insurance premium by the total population of a country.

Bima Vistaar -

• **Background** —

- To further boost the growth towards achieving the objective of insurance for all, IRDAI has been working on the concept of Bima Trinity.
 - Bima Trinity is the result of the initiative by IRDAI in late 2022 in setting up a committee to explore and recommend on how to bring about synergies in the working and operations of insurance companies.
- Bima Trinity initiative consists of 3 programs: **Bima Sugam, Bima Vistaar, and Bima Vahak**.
 - **Bima Sugam** — An online marketplace that allows customers to compare and purchase policies, settle claims, and renew policies.
 - **Bima Vahak** — A women-centric workforce operating at the Gram Sabha level to educate and convince women about the benefits of comprehensive insurance, particularly Bima Vistaar.

• **About Bima Vistaar** —

- It is a **bundled policy** that covers life, health, property, and accidents.
- It provides defined benefits for each risk category, ensuring quick claim payouts without surveyors.
- As a social safety net product, Bima Vistaar targets the untapped geographies.

• **Features of Bima Vistaar** —

- The product Bima Vistaar includes —
 - life cover with a premium of Rs 820,
 - health cover at Rs 500,
 - personal accident cover at Rs 100 and
 - property cover at Rs 80.
- If taken for the entire family on a floater basis, the policy will cost Rs 2,420, with an additional Rs 900 charged for the rest of the family members.
- The sum assured for life, personal accident and property covers is Rs 2 lakh each.
- The health cover, known as hospi cash, offers a sum assured of Rs 500 for 10 days, with a maximum amount of Rs 5,000 available without producing bills or documents.

• **Significance** —

- Bima Vistaar policy underscores its importance in safeguarding individuals and families against various risks and uncertainties.
- This initiative not only encourages more people to invest in insurance for their protection but also promotes financial inclusion.
- The competitive & reasonable pricing of Bima Vistaar is expected to benefit many individuals and families.

Conclusion -

By leveraging the expertise and reach of intermediaries, such as brokers, agents, and insurance advisors, Bima Vistaar has potential to reach and serve the diverse needs of Indian population. It is expected that unlike micro insurance products, it will generate a large sales volume. Now that

the premium has been decided, it will be possible to do a cost benefit analysis of the product for its long-term sustainability.

Inflation Expectation Survey of Households

The Reserve Bank of India (RBI) recently announced the launch of 'Inflation Expectations Survey of Households' and 'Consumer Confidence Survey'.

About 'Inflation Expectations Survey of Households' and 'Consumer Confidence Survey' -

- They are launched by the **Reserve Bank of India (RBI)**. They will provide useful inputs for the bi-monthly monetary policy.
- **Inflation Expectations Survey of Households —**
 - It aims at capturing subjective assessments on **price movements and inflation**, based on their individual consumption baskets.
 - This survey **spans 19 cities**, including Guwahati, Hyderabad, Jaipur, Kolkata, Lucknow, and Thiruvananthapuram.
 - It **seeks qualitative responses from households** on price changes (general prices as well as prices of specific product groups) in the three months ahead as well as in the one-year ahead period.
 - Additionally, it will collect **quantitative data** on current, three-month ahead, and one-year ahead inflation rates.
- **Consumer Confidence Survey —**
 - It aims to gather **qualitative responses from households** regarding their views on the general economic situation, employment scenario, price levels, household income, and spending.
 - This survey will also be **conducted in 19 cities**, including Ahmedabad, Bengaluru, Bhopal, Bhubaneswar, Chandigarh, Chennai, and Delhi.

Acceptance Sampling

The VVPAT-based audit of Electronic Voting Machines (EVMs) is a typical case of “lot acceptance sampling”, a statistical quality control technique widely used in industry and trade.

About Acceptance Sampling -

- It is a **statistical measure** used in **quality control**. It allows a company to determine the quality of a batch of products by selecting a specified number for testing.
- It **tests a representative sample** of the product for defects. The quality of this designated sample will be viewed as the quality level for the entire group of products.
- The **process involves** first, determining the size of a product lot to be tested, then the number of products to be sampled and finally the number of defects acceptable within the sample batch.
- **Products** are **chosen at random** for sampling. It does not assure the quality of the complete set of products from which the sample is derived.
- **Origin —**
 - Acceptance sampling in its **modern industrial form** dates from the early 1940s.
 - It was popularised by Dodge and Romig and originally applied by the U.S. military to the testing of bullets during World War II.
- **Need for Acceptance Sampling —**
 - A **company cannot test every** one of its products at all times.
 - There may be **too many to inspect** at a reasonable cost or within a reasonable timeframe.
 - Also, **comprehensive testing might damage the product** or make it unfit for sale in some way.
 - Testing a small sample would be indicative without ruining the bulk of the product run.

Network as a Service

In a world of hyper-connectivity, network as a service promises to deliver a better day-to-day user experience.

About Network as a Service (NaaS) -

- It is a **cloud service model** in which customers rent networking services from a cloud vendor instead of setting up their own network infrastructure. It allows customers to operate their own networks without maintaining their own **networking infrastructure**.
- Like other cloud services, NaaS vendors run networking functions using software, essentially **allowing companies to set up their own networks** entirely **without hardware**. All they need is Internet connectivity.
- It is a **flexible, scalable, and affordable** option for organisations since it enables them to allocate network resources as needed.
- It **can replace other networking systems** that often require more work and provide less agility, **such as virtual private networks (VPNs) and multiprotocol label switching (MPLS)**.
- In addition, by using NaaS, you **can shift your networking system to your provider**, who can also give you security services to keep your network environment safe. This means you don't have to invest in on-premise firewalls and other security appliances.
- The provider may offer customers a **range of different options, such as —**
 - **Managed services**, where the customer pays to use hardware on a subscription basis while the provider operates and maintains it
 - **Rented hardware**, which is when the provider owns networking hardware and allows the customer to rent it from them. In this situation, customers have to install and operate the equipment themselves.
 - **Full NaaS**, where the **provider handles everything** in relation to the networking hardware, including installing and operating it.

IMF's Stand-by Arrangement

The International Monetary Fund has approved an immediate disbursement of USD 1.1 billion to Pakistan as part of a bailout package supported by the IMF's Stand-By Arrangement (SBA).

About IMF's Stand-By Arrangement -

- It provides **short-term financial assistance** to countries facing **balance of payments problems**. Historically, it has been the IMF lending instrument most used by advanced and emerging market countries.
- **Eligibility —** All member countries facing actual or potential external financing needs. Most often used by **advanced and emerging market countries**, but **low-income countries** sometimes use the SBA together with the **Standby Credit Facility (SCF)**.
- **Conditionality —**
 - Countries' economic policies **must address** the problems that led the country to seek funding.
 - Disbursements conditional on the observance of **quantitative performance criteria**.
 - Progress in implementing **structural measures** that are critical to achieving the objectives of the program is assessed in a holistic way, including via benchmarks.
- **Duration of the assistance —** Typically covers a period of 12-24 months, but not more than 36 months.

Key facts about IMF -

- It **fosters economic growth** and employment by providing temporary financial assistance to countries to help ease the **balance of payments** adjustment and technical assistance.
- **Foundation —** Formed in 1944 at the **Bretton Woods Conference** with the goal of reconstructing the international monetary system.
- **Important Reports —** World Economic Outlook and Global Financial Stability Report
- **Headquarters —** Washington, DC, USA.

SOCIAL ISSUES

Global Alliance for National Human Rights Institutions

The National Human Rights Commission (NHRC) is preparing to defend its human rights processes at a meeting to be held in Geneva. In this meeting a decision on whether India's human rights body will retain its "A status" is expected to be made.

The meeting of the Sub-Committee on Accreditation (SCA) of the UN-recognised Global Alliance of National Human Rights Institutions (GANHRI) worldwide will be held on May 1.

About the National Human Rights Commission (NHRC) -

- It is a **statutory body** established under **Protection of Human Rights Act, 1993**.
- The Commission is the **watchdog of human rights in India**.
- Composition of NHRC —
 - The Commission is a **multi-member body** consisting of a chairperson and five members.
 - The **chairperson should be a retired chief justice of India or a judge of the Supreme Court**.
 - Members should be a serving or retired judge of the Supreme Court, a serving or retired chief justice of a high court and three persons (out of which at least one should be a woman) having knowledge or practical experience with respect to human rights.
- Appointment and Tenure —
 - The chairperson and members are appointed by the President on the recommendations of a six-member committee consisting of:
 - Prime Minister as its head; Speaker of the Lok Sabha; Deputy Chairman of the Rajya Sabha; Leaders of the Opposition in both the Houses of Parliament; Central Home Minister
 - The chairperson and members are appointed for the **term of 3 years or till the age of 70 years**, whichever is earlier.
 - The chairperson and members are **eligible for reappointment**.

Global Alliance for National Human Rights Institutions (GANHRI) -

- About —
 - It is an organisation affiliated to the UN High Commissioner for Human Rights.
 - It is a global network of national human rights institutions (NHRIs) that works to promote and protect human rights.
 - GANHRI represents 120 NHRIs from around the world.
 - GANHRI's mission is to unite, promote, and strengthen NHRIs to operate in line with the UN Paris Principles.
- Accreditation by the GANHRI —
 - **Sub-Committee on Accreditation (SCA)** reviews NHRIs every five years, and there is an appeal process for NHRIs to ensure greater transparency and due process.
 - In a unique peer-review-based accreditation process. GANHRI ensures individual NHRIs' compliance with **the Paris Principles** - to ensure their independence, pluralism and accountability.
 - The **Paris Principles** set out internationally agreed minimum standards that NHRIs must meet to be considered credible.
 - The six principles require a country's human rights agency to be independent from the government in its structure, composition, decision-making and method of operation.
 - An NHRI is reviewed by the SCA when -
 - It applies for initial accreditation
 - It applies for re-accreditation every five years
 - The circumstances of the NHRI change in any way that may affect its compliance with the Paris Principles.
 - NHRIs that are assessed as complying with the Paris Principles are accredited with '**A status**', while those that partially comply are accredited with '**B status**'.
 - This accreditation status affects a country's ability to vote at the UN Human Rights Council and some UNGA bodies.

- India's accreditation —
 - India's NHRC got 'A' status of accreditation for the first time in 1999, which it retained in 2006, 2011, and in 2017 after it was deferred for a year.

India's accreditation status under review -

- **Background** —
 - The NHRC's ratings were put on hold in 2023 over concerns on:
 - composition procedure,
 - presence of police personnel in human rights investigations, and
 - lack of gender and minority representation.
 - Now, on May 1, 2024, NHRC's performance will again be reviewed in order to decide on the accreditation status.
- **Observations made by the review committee in 2023** —
 - According to a six-point submission by the SCA in March 2023, the NHRC has failed to create conditions required to be able to operate independent of government interference.
 - In the submission, the committee had slammed India for the involvement of police officers in its investigative process, calling it a conflict of interest.
 - It also cited the lack of pluralism and gender representation, given the NHRC had only one woman in its top body, an institutional ex-officio representative of the National Commission for Women.
 - The SCA had also pointed out that the composition of the committee should reflect the diversity of the society it operated in.
 - It indicated the lack of any member representing India's largest minority religions.

Analysing labour on a Warming Planet

The International Labour Organisation (ILO) had recently published a report title "**Ensuring safety and health at work in a changing climate**". The ILO published this report to bring attention to the global health threat workers are currently facing.

Details -

- The report indicates that there is an urgent call to ensure the future of labour is climate proofed and to address the constantly evolving work environment as the planet warms. The report states that well over a third of the world's population, are exposed to excessive heat annually, leading to almost 23 million work-related injuries.
- The ILO has sought an overhaul of existing Occupational Safety and Health-related (OSH) protections and laws, as they have struggled to keep up with the evolving risks from climate change, resulting in worker mortality and morbidity.

What are the Emerging Hazards?

- The ILO has identified six key impacts of climate change. They are —
 - Excessive heat
 - Ultraviolet (UV) radiation
 - Extreme weather events
 - Workplace air pollution
 - Vector-borne diseases
 - Agrochemicals
- These could lead to a range of health issues such as stress, stroke and exhaustion.
- The ILO mentions agriculture workers, workers in the construction sector, conservancy workers in cities and those employed in transport and tourism as most affected by climate change.
- It is also important to take note of the **global rise in gig employment, which is highly heat-susceptible**.
 - It is also one of India's fastest growing worker communities, such as ride hailing app drivers, food and groceries deliverers, home repair workers like electrician, plumbers, and AC mechanics, and courier service employees.
 - Gig workers constitute about 1.5% of India's total work force, which is projected to grow to about 4.5% by 2030, according to a Nasscom study.
- In the Indian context, all these segments put together suggest that about **80% of the country's 2023 workforce of 600 million is susceptible to heat-related hazards**.

- That is 180 million more than the entire current population of South America.

Which sectors are affected the most?

• **Agriculture Sector —**

- Agriculture is by far the most heat susceptible sector globally, particularly so in the developing world, where informal farm labourers work with little to no weather protection.
- According to the Union Agriculture Minister Arjun Munda, December 2023 replies in Parliament, **‘about 45.76% of the total Indian workforce was engaged in agriculture and allied sector during 2022-23’**.
- This is fast reducing, and about 20% down from the numbers working in agriculture three decades ago.
- The NSSO data of July 2018-June 2019 reveal that almost 90% of Indian farmers own less than two hectares of land, and earn an average monthly income of a little over ₹10,000.
- Farmers in the bottom three States of Jharkhand, Odisha and West Bengal are earning as low as ₹4,895, ₹5,112, and ₹6,762.
- About half of India’s farmers are indebted, they lack access to modern technology and latest research in agriculture.
- This leaves little room for them to invest in adapting to a warming planet.
- Many communities have already begun shifting work timings to early mornings and sun-down hours as a heat coping mechanism.
- The ILO advises more hydration points, breaks and rest shelters in the country’s plantations.

• **Micro, Small and Medium Enterprises (MSME) Sector —**

- Agriculture is followed by India’s MSME sector that **employs about 21% of the country’s workforce, or more than 123 million workers**.
- This sector of about 64 million enterprises, second only in size to China’s MSME segment, contributes almost half of India’s exports and more than a third of the country’s total manufacturing output.
- Yet, the overwhelming informalisation of the sector has meant little to no oversight of worker conditions by State Occupational Safety and Health (OSH) departments, leaving them highly vulnerable to heat hazards.

• **Building & Construction Sector --**

- MSME sector is followed by the building and construction segment which **constitutes about 70 million workers, almost 12% of India’s workforce**.
- Workers here must cope with the urban heat island effect, as construction is a highly urban-centric economy, with rising growth in cities.
- Construction workers are also the most prone to physical injuries and air pollution related health hazards, like asthma, as several Indian cities are among the most polluted globally.

What laws address Workplace Safety?

- A range of more than 13 central laws in India regulate working conditions across several sectors. These include:
 - The Factories Act, 1948, the Workmen Compensation Act, 1923, the Building and Other Construction Workers Act, 1996, the Plantations Labour Act, 1951, the Mines Act, 1952 and the Inter-State Migrant Workmen Act, 1979.
- These laws were consolidated and amended in September 2020 under one law — the **Occupational Safety, Health and Working Conditions Code, 2020** (OSH Code, 2020).
- While several unions are critical of the new law for watering down safety and inspection standards, **the Union government is yet to officially notify its enforcement**.
- This has meant that unions and the judiciary continue to rely on the older laws to seek redress and accountability.
- The **Indian Factories Act** defines a factory as an enterprise with “10 or more” workers, but those registered under this law are less than a quarter of a million based on the latest available data.
 - An overwhelming majority of India’s 64 million MSMEs are not registered under this law, and are therefore outside the purview of governmental inspections.
- **Provisions w.r.t. Heat Hazards —**
 - When it comes to dealing with occupational heat, the **Factories Act broadly defines ventilation and temperature and leaves it to the States to decide optimal standards based on specific industries**.

- However, these regulations were framed more than five decades back.
 - For instance, Maharashtra framed its rules under the law in 1963, while Tamil Nadu did so in 1950.
 - Both these rules mention a maximum wet bulb temperature of 30°C on a shop floor with a height of 1.5 metres and also mention provisioning adequate air movement of at least 30 meters per minute.
- **Provisions w.r.t. Other Climate Hazards —**
 - While the OSH 2020 Code has attempted some remediation, lawyers point to a clause which allows online inspection of safety by enterprises.
 - These raise serious concerns of compromising a law that is already weak in implementation.

Thrombocytopenia Syndrome

Recently, AstraZeneca (AZ) has admitted its COVID vaccine may cause Thrombosis with Thrombocytopenia Syndrome (TTS).

About Thrombosis with Thrombocytopenia Syndrome -

- It is characterised by **blood clots** (thrombosis) combined with **low levels of platelets** (thrombocytopenia), which are necessary for blood clotting.
- It often involves unusual blood clot locations, such as in **the brain** (cerebral venous sinus thrombosis) or **abdomen**.
- **Symptoms of TTS —** Severe or persistent headaches, blurred vision, Shortness of breath, Chest pain, Leg swelling, Persistent abdominal pain and Easy bruising or tiny blood spots under the skin beyond the injection site etc.
- It is **classified into two tiers** based on the location of the blood clot and the severity of the symptoms.
- **Tier 1 —**
 - **Uncommon site of thrombosis** (like the brain-cerebral venous sinus thrombosis or the gut such as splanchnic vein, associated with bowel ischaemia and surgery, portal vein or other rare venous and arterial thromboses).
 - Thrombosis in more common locations (deep vein thrombosis or pulmonary embolism).
 - Platelet count is less than 1,50,000 per microlitre.
 - A positive anti-PF4 ELISA result is supportive, but not required for diagnosis.
- **Tier 2 —**
 - **Common sites of thrombosis** include leg or lungs (venous thromboembolism, deep vein thrombosis, pulmonary embolism).
 - Platelet count is less than 1,50,000 per microlitre.
 - A positive anti-PF4 ELISA result is required.
- **Tier 1 TTS** carries a **higher risk of mortality** and morbidity than Tier 2. Tier 1 could be more common among younger age groups.

Global Leaders Group on Antimicrobials

Recently, the European Society for Clinical Microbiology and Infectious Diseases and the Global Leaders Group (GLG) on AMR jointly organised a high-level event, 'Forging partnerships between science and policy'.

About Global Leaders Group on Antimicrobial Resistance -

- It consists of **world leaders and experts** from across sectors working together to accelerate political action on antimicrobial resistance (AMR).
- It performs an independent global **advisory and advocacy role** and works to maintain urgency, public support, political momentum and visibility of the AMR challenge on the global health and development agenda.
- **Background —**
 - It was **established in November 2020** following the recommendation of the Interagency Coordination Group (IACG) on Antimicrobial Resistance to strengthen global political momentum and leadership on AMR.
 - The inaugural meeting of the Group took place in January 2021.

- **Secretariat** — The Quadripartite Joint Secretariat (QJS) on Antimicrobial Resistance, a joint effort by the **Food and Agriculture Organization** of the United Nations (FAO), the **United Nations Environment Programme** (UNEP), the **World Health Organization** (WHO) and the **World Organisation for Animal Health** (WOAH) provide secretariat support for the Group.

What is antimicrobial resistance (AMR)?

- It is the ability of **bacteria and other microbes** to **resist the drugs** used to inhibit or kill them.
- These microbes are sometimes referred to as ‘superbugs’ and are responsible for causing drug-resistant infections that are difficult to treat.
- **Causes of AMR** —
 - AMR is a naturally occurring phenomenon, the main cause of resistance to antimicrobials is antimicrobial drug use.
 - Current high usage of antimicrobial **drugs in humans, animals and plants** is leading to a concerning rise in drug-resistance and making infections harder to treat.

Hindu Marriage Act, 1955

The Supreme Court recently said mere registration of marriage in absence of a proper ceremony would not be valid under the Hindu Marriage Act.

About Hindu Marriage Act, 1955 (HMA Act) -

- It **codifies** the law relating to marriage among Hindus.
- It not only **provides for** the **ceremonies and registration** for Hindu marriage but also lays down rules regarding divorce.
- **Salient Features** —
 - A **Hindu by birth or by conversion** is the subject of HMA Act.
 - The definition of Hindu under the HMA Act **includes Buddhist, Jain, and Sikh** as well.
 - **Marriageable age** —
 - The **bridegroom** must be at **least 21 years old**, and the **bride** must be at **least 18 years old** when they get married.
 - **Marriage among minors is punishable** with imprisonment upto 3 years and/or fine upto Rs 1 lakh.
- **Significance of ceremonies** —
 - **Customary practices** (customs/ long-term usages (Reeti-Riwaz)) are well **respected under the HMA Act**.
 - **Saptapadi**, i.e., steps taken by the bride and groom before holy fire, is a **necessary ritual for marriage** among Hindus.
 - However, marriage **ceremonies are subject to customs** and accepted accordingly.
- **Forbidding bigamy** —
 - It also brought an **end to** the customary practice of **bigamy, polygamy, or polyandry**, i.e, multiple marriages.
 - Section 5 of the Act specifies that **it is illegal to have two living wives at once**, which is known as bigamy.
 - **If one spouse is alive and the person remarries**, such marriage is not only void, but the person is also **punishable under** Sections 494 and 495 of the **Indian Penal Code, 1860**.
- **Focus on mental stability** —
 - A marriage is considered **null and void if anyone one** or both the people **get married being mentally unfit**.
 - **In such cases**, the couple **must get legal consent** before getting married.
- **Registration** —
 - **Registration** of a Hindu marriage is **subject to laws applicable in particular states**.
 - However, a marriage is **not invalid** or illegal **due to lack of an official certificate**.
- **Divorce** —
 - The Act also **allows divorce through mutual consent**.
 - Although parties are **legally not allowed** to seek **divorce within 1 year** of marriage, they **can go for judicial separation**.

- However, divorce may be granted before completion of 1 year in special circumstances of exceptional hardship.
- It provides for the various grounds on the basis of which, divorce can be granted to one of the spouses if another does not agree to separate.
- There are special grounds which specifically allow the wife to seek divorce from her husband.
- Restitution of conjugal rights —
 - Unlike any other matrimonial laws in India, the HMA Act also contains provisions for restitution of conjugal rights.
 - So, if one of the spouses leaves the other without any reasonable excuse, the other spouse may reach the court to restore their matrimonial relations and bring back the spouse.
- Legal Procedures —
 - Matters of Hindu marriages and divorce follow procedure in family court in India.
 - Matters under the Act are taken up by the courts of territorial jurisdiction (city/ town) where the marriage was celebrated, where one of the parties resides, or where the husband and wife last resided together.

International Labour Day

The International Labour Day was recently observed to honour the contribution of workers across the world.

About International Labour Day -

- International Labour Day, also known as **Workers Day** or **May Day**, is a global event that takes place annually on **May 1st**.
- It is a day dedicated to **honouring the efforts and achievements of workers** and the **labour movement**.
- **Over 80 countries**, including **India, Cuba, and China**, mark **International Labour day**.
- On this day, people all over the world march to advocate working-class rights and protect them from exploitation.
- History —
 - The origins of International Labour Day can be traced back to the late 19th-century labour movement in the United States.
 - **In 1886, a large demonstration** happened in **America** where the labours demanded eight hours of work on a daily basis.
 - However, soon the **demonstration went out of hand**, and in Chicago, a lot of people got hurt. This incident came to be **known as the Haymarket Affair**.
 - **The Haymarket Affair incident** marked the **start of International Labour Day**.
 - **In 1889**, a lot of **socialist parties in Europe** came together and **decided to celebrate May 1** as International Labour Day.
 - Since then, the special day has been observed every year on the same day.
 - **In India**, the **first May Day** was **celebrated in Chennai** (then Madras) **in 1923** by the **Labour Kisan Party of Hindustan**.

About International Labour Organisation (ILO) -

- It is a **specialised agency of the United Nations** (UN) dedicated to improving labour conditions and living standards throughout the world.
- **Established in 1919 by the Treaty of Versailles** as an affiliated agency of the League of Nations, the **ILO became the first affiliated specialised agency of the UN in 1946**.
- It is **devoted to advancing opportunities** for women and men **to obtain decent and productive work** in conditions of freedom, equity, security, and human dignity.
- Its main aims are to **promote rights at work, encourage decent employment opportunities**, enhance **social protection**, and strengthen dialogue in handling work-related issues.
- The ILO also **provides technical assistance** in social policy and administration and in workforce training; fosters cooperative organisations and rural industries; **compiles labour**

statistics and conducts research on the social problems of international competition, unemployment and underemployment, labour and industrial relations, and technological change (including automation); and **helps to protect the rights of international migrants and organised labour.**

- In recognition of its activities, the ILO was awarded the **Nobel Prize for Peace in 1969.**

[Auto-brewery Syndrome](#)

A drunk driving case against a 40-year-old man was dismissed after his lawyer explained that he suffers from auto-brewery syndrome.

About Auto-Brewery Syndrome -

- It is also known as **gut fermentation syndrome.**
- It is a condition in which the body turns **sugary and starchy food into alcohol**, causing symptoms similar to that of a drunken man.
- It is a condition in which **ethanol is produced** through **endogenous fermentation** by fungi or bacteria in the gastrointestinal (GI) system, oral cavity, or urinary system.
- In other words, while yeasts and fungi feed on sugars and starch and convert them into energy, the process also creates waste in the form of carbon dioxide and ethanol (alcohol).
- **Symptoms** — Its symptoms include being drunk without drinking alcohol or getting very drunk with only a little alcohol. Dizziness, headache, dehydration are a few among several other symptoms of the condition.
- People with **diabetes, obesity, and Crohn disease** are more likely to **get ABS.** However, it can occur in healthy individuals as well.
- Many medical reports suggest that people who suffer from ABS should avoid foods that are high in carbohydrates and sugar.

[Nephrotic Syndrome](#)

Researchers from Kerala have reported a series of cases where the regular use of fairness creams has been linked to nephrotic syndrome.

About Nephrotic Syndrome -

- It is a **kidney disorder** that causes your body to **pass too much protein in your urine.**
- It usually **results from a problem with your kidneys' filters (glomeruli).**
 - The **kidneys remove waste** and excess fluid from your blood **through filtering units called nephrons.**
 - **Each nephron contains** a filter (**glomerulus**), which **removes waste and excess fluids from your blood** and **send them to your bladder as urine.**
 - Common waste products include nitrogen waste (urea), muscle waste (creatinine), and acids.
 - In healthy kidneys, the glomeruli filter out waste products.
 - They allow your blood to **retain the cells and proteins** your **body needs** to function regularly.
 - **Nephrotic syndrome** usually happens when the **glomeruli are inflamed, allowing too much protein to leak** from your blood **into your urine.**
- **Causes** —
 - It is **not a specific kidney disease.**
 - It can **occur in any kidney disease that damages** the **filtering units** in a certain way that allows them to **leak protein into the urine.**
 - **Some of the diseases** that cause nephrotic syndrome, such as **nephritis**, affect only the kidney.
 - Other diseases that cause nephrotic syndrome, such as **diabetes and lupus**, affect other parts of the body as well.
- **Symptoms** — Signs and symptoms of nephrotic syndrome include —
 - **Severe swelling** (edema), particularly around your eyes and in your ankles and feet

- **Foamy urine**, a result of excess protein in your urine

- **High fat and cholesterol levels in the blood.** The medical term for it is “**hyperlipidemia.**”
- **Weight gain** due to fluid retention
- **Fatigue**
- Loss of appetite
- Nephrotic syndrome can **lead to serious complications**, including —
 - **blood clots** that can lead to thrombosis
 - higher **risk of infection caused by the loss of immunoglobulins**, proteins in your blood that help fight viruses and bacteria
 - **high blood pressure**, also called **hypertension**
 - brief or **long-lasting kidney problems**, including chronic kidney disease and kidney failure
- **Treatment** — It includes **addressing the underlying cause** and taking steps to reduce high blood pressure, high cholesterol, swelling and infection risks. Treatment usually **includes medications** and **changes to your diet.**

[NIEPID](#)

The Union Government is expected to roll out a new test designed by the National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID) to diagnose Specific Learning Disabilities (SLDs) in adults in India.

About National Institute for the Empowerment of Persons with Intellectual Disabilities (NIEPID) -

- NIEPID (formerly the National Institute for the Mentally Handicapped), established in 1984, is an **autonomous body** under the administrative control of the Department of Empowerment of Persons with Disabilities (Divyangjan), **Ministry of Social Justice & Empowerment.**
- It is dedicated **to providing quality services to Persons with Intellectual Disabilities** (Divyangjan) in the national interest.
- It is the **apex body** functioning for **training, research, and surveys** in the **field of intellectual disability** in the country.
- The institute is **headquartered in Secunderabad**, Telangana, and has **regional centres in Kolkata, Navi Mumbai and Noida.**
- It **empowers persons with intellectual disabilities** (Divyangjan) **to access** state-of-the-art **rehabilitation interventions**, educational, therapeutic, vocational, employment, leisure and social activities, sports, cultural programmes and full participation.
- **Objectives** —
 - Human Resources Development
 - Research and Development
 - Development of models of care and rehabilitation.
 - Documentation and dissemination.
 - Consultancy services to voluntary organisations
 - Community Based Rehabilitation
 - Extension and Outreach programmes
- To achieve optimum results, the institute has developed and **introduced innovative** structured **training courses** like Early Intervention, Rehabilitation Psychology, Special Education, and Disability Rehabilitation at the Masters level.
- The Institute **conducts international and national-level Conference/Seminars/Workshops** on Persons with Intellectual Disabilities (Divyangjan) in partnership with leading voluntary organisations and parent associations.

[Vitrectomy](#)

Delhi minister Saurabh Bharadwaj announced that Aam Aadmi Party colleague and Rajya Sabha MP Raghav Chadha had travelled to the United Kingdom for urgent vitrectomy surgery.

What is Vitrectomy?

It is a surgical procedure that removes the vitreous humour, a gel-like substance that fills the eye between the lens and the retina. This surgery is **essential for treating a variety of eye conditions**, particularly those that affect the retina and the clarity of vision.

How is it Performed?

During a vitrectomy, **an ophthalmologist makes tiny incisions in the sclera**, the white part of the eye, allowing the insertion of specialised instruments. These instruments can cut away and remove the vitreous humour, enabling the surgeon to access and repair any underlying retinal issues.

Why does one undergo surgery?

One of the most common reasons for this surgery is **retinal detachment**, a condition where the retina separates from the back of the eye, leading to potential blindness if not promptly treated. In some cases, the surgery may also be performed **to remove foreign objects from the eye**, or to address complications from previous eye surgeries, such as cataract surgery. Overall, the surgery's goal is **to address and repair vision-threatening conditions**, improving or preserving sight for patients.

What are the complications of surgery?

Vitrectomy, while a life-changing procedure for many patients, comes with its share of potential complications, like infection; cataract formation; retinal detachment (new detachment or worsening of existing detachment possible); bleeding, scarring, or swelling within the eye; etc.

Biohacking

Biohacking is picking up in India especially in metro cities like Delhi and Mumbai and also slowly making inroads into Tier II and III cities too.

About Biohacking -

- It is a term used to describe various tips and tricks for enhancing the **body's ability to function** at peak performance—and maybe even extend one's lifespan.
- It includes the practice of employing methods drawn from fields like **biology, genetics, neuroscience and nutrition** to enhance physical or mental performance, improve overall health and well-being, or achieve a specific health outcome.
- Most types of biohacking generally fall into one of the following categories below —
 - **Lifestyle** — It focuses on making positive health and behaviour choices. It is probably the most accessible way most people can start experiencing biohacking, as it includes factors like dietary **shifts, breathwork, meditation and exercise**.
 - **Molecular** — It involves the use of **natural and synthetic molecules** that can help shift one's biology. Taking supplements would fall into this biohacking category.
 - **Biologics** — These are biological products that are meant to improve or enhance biology. They could be cells, or they could be small little information packets like exosomes, which are basically biological bundles of **DNA, mRNA proteins and growth factors**. Biologics typically need to be ingested, injected (such as stem cells) or delivered intravenously (i.e. by IV transfusion).
 - **Technology** — It includes devices like **wearables** (such as smartwatches) and **diagnostics** (such as blood sugar monitors). In such cases, biohacking uses technology to gather data about the body and its functioning so an individual can use that information to adjust their health as they strive for improved performance.
- There are currently **no laws in India** that specifically address biohacking.

INTERNATIONAL RELATIONS

ASEAN Future Forum

Recently, India's External Affairs Minister participated in the First 'ASEAN Future Forum'.

About ASEAN Future Forum -

- It acts as a platform for ASEAN and its partners to share new ideas and policy recommendations.
- It is aimed at creating a common platform for ASEAN member states as well as partner countries and ASEAN people to contribute to promoting and shaping the bloc's development path.
- It was **proposed by Vietnam** at the 43rd ASEAN Summit in 2023.
- **Theme of the first forum** — Toward fast and sustainable growth of a people-centred ASEAN Community.
- It took place in Hanoi, Vietnam.

Key facts about ASEAN -

- It is a group of the Association of Southeast Asian Nations, which was established in 1967 with the signing of the Bangkok declaration.
- **Founding members** — Indonesia, Malaysia, Philippines, Singapore and Thailand.
- **Presently ASEAN comprises 10 member states** namely Indonesia, Malaysia, Philippines, Singapore, Thailand, Brunei, Laos, Myanmar, Cambodia and Vietnam.
- It promotes intergovernmental cooperation and facilitates economic, political, security, military, educational, and sociocultural integration between its members and other countries in Asia.

World Intellectual Property Day

Nasscom recently released Patenting Trends in India report on World Intellectual Property Day.

About World Intellectual Property Day -

- It is celebrated every year on **April 26**. The day aims to **raise awareness about Intellectual Property (IP) rights** and its role in encouraging innovation and creativity to make the world a better place.
 - The day was **established in 2000** by the **World Intellectual Property Organisation (WIPO)**.
- **Official theme** for World Intellectual Property Day 2024 — '**IP and the SDGs: Building Our Common Future with Innovation and Creativity**'.
- **History** —
 - In **1883**, the **Paris Convention for the Protection of Industrial Property** was signed, which further established protection for intellectual properties. It was aimed at protecting inventions, trademarks and industrial designs.
 - In **1970**, the **Convention establishing the World Intellectual Property Organisation** entered into force, creating WIPO. It is a **specialised agency of the United Nations**.
 - WIPO is a **self-funding agency** of the United Nations, with 193 member states that works to promote the protection and advancement of intellectual property worldwide.

Patenting Trends in India Report -

- It was released by **Nasscom** on World Intellectual Property Day.
- Mirroring global trends, in **FY2023, India witnessed 83,000 patents** being filed, marking an annual growth rate of 24.6%, the highest in the last two decades.
 - The **number of patents granted** also witnessed significant growth, **rising over 2X** between FY2019 and FY2023.
- The **share of patents filed by residents** of India has **doubled over the last decade**, from 33.6 percent of the total filings in the fiscal year 2019 to over 50 percent by the fiscal year 2023.
- **Maximum patent applications** were in the **field of healthcare**, essentially around medical imaging, diagnosing, report generation and testing.
- Other areas that are important for filing a patent are Automation/Software Development and Retail/e-commerce.
- Artificial Intelligence saw the maximum patents filed in the areas of image processing, Natural Language Processing and Predictive modelling, while Gen AI, Medical Data Processing and Cognitive computing are the key emerging areas.

ENVIRONMENT

Uttarakhand Forest Fires

A massive fire is spreading through the forests near Nainital in Uttarakhand. It has been burning for 60 hours, leading to the deployment of Indian Air Force personnel and Mi-17 choppers in an effort to quell the raging fire. According to the officials, these forest fires have gutted over 142 hectares of forest land in the State.

What are Forest Fires/Wildfires?

- It is an unplanned, uncontrolled & unpredictable fire in an area of combustible vegetation.
- **Causes —**
 - These include natural (lightning, high atmospheric temperatures and low humidity (dryness) and man-made (agricultural practices like Jhum, a source of fire (cigarette, bidi, etc)].
 - Three conditions must be present in order for any fire to exist: fuel, oxygen and a heat source. This is often referred to as the **fire triangle**.
 - In the case of a forest, oxygen is in ample supply, and fuel is supplied in the form of dry trees, shrubs, grasses and litter - particularly in the dry, hot summer months.
 - Dry weather, drought and dry vegetation can offer easy kindling for a fire. Strong winds further help the spread of a forest fire.
 - As per a 2019 report from the Forest Research Institute, 95% of forest fires are caused by humans.
 - Often, grazers set fire to dry grass in the hopes of encouraging the cultivation of new grass.
 - Slash and burn and shifting cultivation also use fire. Unattended campfires, burning of waste, lit cigarette stubs as well as intentional lighting of fires with criminal intent are some other man-made causes.
 - Natural causes included the rubbing of dry trees or bamboo, sparks set off by stones, or lightning.

Why is Uttarakhand an easy target for forest fire?

- **Vulnerability of Indian forests —**
 - According to the report of the Forest Survey of India, over 54% of the forest cover in India is exposed to occasional fire.
 - There are four forest-fire clusters in India- the North-Western Himalayas, North-East India, Central Ghats, and Western and Eastern Ghats.
- **Situation in North-Western Himalayas —**
 - Fires in the North-Western Himalayas are attributed to the preponderance of pine trees and the accumulation of thick flammable litter.
 - In the summer, there is a large quantity of pine needles that gathers on the forest floor, which is highly susceptible to fire.
 - The occurrence of high fire intensity at the low altitude Himalayan hilly regions may also be due to the proximity to villages.
 - Villages make forests susceptible to anthropogenic activities like forest cover clearance, grazing and so on.
 - Sharp increase in average and maximum air temperature, decline in precipitation, and change in land-use patterns have also caused increasing episodes of forest fires in this region.
 - Local community patterns are also responsible for instances of forest fire.

How can forest fires be tackled?

- **Awareness and controlled burning —**
 - Besides spreading awareness, there are certain measures that can be undertaken to reduce the incidence of forest fire.
 - This includes the removal of biomass through controlled or prescribed burning.
 - Limited and controlled forest burns have been shown to be useful in promoting healthy forest growth, getting rid of undergrowth, dead trees and litter. Fresh healthy plants replace such areas.

- Once a patch of land is burned or cleared of dried biomass by a ground-fire, it is difficult for another fire to occur there.
- This process is usually done by taking 5.2-metre-wide fire-lines or fire-belts in forested areas to which people have access.
- **Other preventive steps —**
 - Engaging temporary fire watchers, desilting of water sources within the forest, and having fire safety equipment at hand.
 - Increase surveillance of forests using drones
- **Steps taken by the government —**
 - A satellite-based fire alert system introduced by the Forest Survey of India. This makes it easy for staff to find out whether there are fires inside the forest.
 - Forest staff use methods like beating the fire with green, leafy boughs, and counter-fires. They also carry fire beaters and blowers.

Deaths caused by lightning

A new study of lightning-related deaths in Bihar has revealed that various districts of Bihar were vulnerable to this natural hazard, recording the highest casualty rate per million population. The study examined data from the 2017-2022 period and found that 1,624 people died and 286 were injured due to lightning.

What is lightning?

- **About —**
 - Scientifically, lightning is a rapid and massive discharge of electricity in the atmosphere some of which is directed towards earth.
 - The discharges are generated in giant moisture-bearing clouds that are 10-12 km tall.
 - The base of these clouds typically lie within 1-2 km of the Earth's surface, while the top is 12-13 km away. Temperatures in the top of these clouds are in the range of -35° to -45°C.
- **Mechanism —**
 - **Smaller ice crystals are moving up while bigger crystals are coming down —**
 - As water vapour moves upward in the cloud, the falling temperature causes it to condense.
 - As they move to temperatures below 0°C, the water droplets change into small ice crystals.
 - They continue to move up, gathering mass until they are so heavy that they start to fall to Earth.
 - This leads to a system in which, simultaneously, smaller ice crystals are moving up and bigger crystals are coming down.
 - **Collision between these crystals and release of electrons —**
 - Collisions follow and trigger the release of electrons, a process that is very similar to the generation of sparks of electricity.
 - As the moving free electrons cause more collisions and more electrons, a chain reaction ensues.
 - **Potential difference between top layer and middle layer of the cloud —**
 - This collision results in a situation in which the top layer of the cloud gets positively charged, while the middle layer is negatively charged.
 - The electrical potential difference between the two layers is huge, of the order of a billion to 10 billion volts.
 - In very little time, a massive current, of the order of 100,000 to a million amperes, starts to flow between the layers.
 - **Earth — a good conductor of electricity —**
 - While the Earth is a good conductor of electricity, it is electrically neutral.
 - However, in comparison to the middle layer of the cloud, it becomes positively charged.
 - As a result, about 15%-20% of the current gets directed towards the Earth as well.
 - It is this flow of current that results in damage to life and property on Earth.

Areas which are lightning-prone -

- As per the report released by the Climate Resilient Observing Systems Promotion Council (CROPC) in 2022, following states are more vulnerable to lightning strikes:

- Madhya Pradesh followed by Chhattisgarh, Maharashtra, Odisha and West Bengal.
- Other states with high strike rate include Bihar, UP, Karnataka, Jharkhand and Tamil Nadu.
- Lightning is fairly common, though it is not often realised in the urban centres.
- In India, well over one crore lightning strikes have been recorded in recent years.
- It is only over the last few years that lightning records have begun to be maintained, due to the efforts of CROPC and India Meteorological Department.

Mitigating the effects of lightning strikes -

- **Lightning – not classified as a natural disaster in India —**
 - As of now, lightning is not classified as a natural disaster in India.
 - As per the Centre, deaths caused by it can be avoided through education and awareness.
- **Setting up of an early warning system —**
 - India has set up of an early warning system, that is already saving many lives.
 - India is among the only five countries in the world with an early warning system for lightning and the forecast is available from five days to up to 3 hours.
- **Most deaths happening in rural areas —**
 - More than 96% of lightning deaths happen in rural areas. As such, most of the mitigation and public awareness programmes need to focus on these communities.
 - Lightning protection devices are fairly unsophisticated and low-cost. Yet, their deployment in the rural areas, as of now, is extremely low.
- **States are encouraged to prepare and implement lightning action plans —**
 - States are being encouraged to prepare and implement lightning action plans, on the lines of heat action plans.
 - An international centre for excellence on lightning research to boost detection and early warning systems is also in the process of being set up.

Reports on deaths caused by lightning in Bihar -

- **Annual casualty rate per million is highest in Bihar —**
 - Bihar's annual casualty rate per million of 2.65 was higher than the national average of 2.55.
- **Period between May to September was the peak for lightning strikes —**
 - The period between May to September was the peak for lightning strikes with June and July accounting for 58.8 per cent of lightning-linked deaths.
 - Researchers explained that lightning strikes reach a record high in June and July with the monsoonal current setting in, mainly due to the interplay of easterly and westerly winds.
- **The plains area is prone to thunderstorms and lightning activity —**
 - The plains area is prone to thunderstorms and lightning activity as warm, dry air from north-west India converges with moist air emanating from the Bay of Bengal.
 - This creates conditions that are favourable for the formation of deep convective clouds.
- **Higher population density and socio-economic factors also play a role —**
 - In North West Bihar, the lightning strikes are lower but casualties are higher.
 - These parts of Bihar are not urbanised and may be having poor shelter density around farm areas.
 - Socio-economic factors play an important role in mitigating the impact of such natural hazards.
- **Threat potential of lightning strikes is not uniform —**
 - Topography, elevation, and local meteorological factors determine the spatial distribution of lightning strikes.
 - A higher lightning frequency is seen in the eastern region owing to higher moisture incursion.

Satellite Remote-Sensing to analyse Glacial Lakes

Recently, ISRO released satellite-data-based analysis on expansion of glacial lakes in the catchments of Indian Himalayan River basins.

This is the latest among a series of studies on glacial lakes that have highlighted the risks of glacial lake outburst floods (GLOFs), and their impact on infrastructure and settlements downstream of such lakes.

Key highlights of the study by ISRO -

- **The study —**
 - ISRO’s analysis looked at satellite data archives spanning the past four decades to assess changes in the glaciated environment.
 - Long-term satellite imagery covering the catchments of Indian Himalayan River basins — spread over India, Nepal, Tibet, and Bhutan — is available from 1984 onwards, till 2023.
- **Findings —**
 - ISRO’s data has indicated significant expansion in the size of glacial lakes.
 - Of the 2,431 lakes larger than 10 hectares (identified during 2016-17), **676 glacial** lakes had expanded significantly since 1984.
 - ISRO said that **130 of the 676 lakes** are situated in India, in the Indus (65), Ganga (7), and Brahmaputra (58) river basins.
 - These lakes have expanded as glaciers are retreating at an ever-faster rate due to global warming.

Glacial lakes -

- **About —**
 - Glacial lakes are bodies of water that form in depressions or basins created by the erosive action of glaciers.
 - These lakes are typically found in regions where glaciers have previously existed or are currently present.
 - Glacial lakes vary in size and shape, ranging from small ponds to large, deep bodies of water.
 - ISRO categorised glacial lakes into four broad categories based on how they were formed — moraine-dammed, ice-dammed, erosion-based, and ‘others’.
 - Glacial lakes are crucial sources of freshwater for rivers.
 - However, they also pose significant risks, specifically of Glacial Lake Outburst Floods (GLOFs).
 - GLOFs occur when glacial lakes release large volumes of meltwater due to the failure of natural dams, resulting in sudden and severe flooding downstream.
- **Formation —**
 - **Glacial Erosion —**
 - Glaciers are massive bodies of ice that move slowly over the landscape, eroding and shaping the underlying bedrock through processes such as abrasion and plucking.
 - As glaciers advance, they carve out deep valleys and basins in the landscape.
 - **Deposition of Glacial Moraines —**
 - As glaciers move, they carry vast amounts of sediment and debris, including rocks, gravel, and sand.
 - When glaciers retreat or melt, they deposit this material at their edges, forming features called moraines.
 - Moraines can act as natural dams, blocking the flow of water and creating depressions where glacial lakes can form.
 - **Melting Ice —**
 - As temperatures rise or glaciers retreat, the ice within the glacier melts, filling the depressions created by glacial erosion with water.
 - This water collects in the basins, forming glacial lakes.
 - **Terminal Moraine Formation —**
 - In some cases, glaciers deposit large **ridges** of sediment and debris at their terminus, creating natural dams that impound water and form glacial lakes behind them. These lakes are called terminal moraine lakes.

Use of remote-sensing technology to monitor glacial lakes -

- The monitoring of glacial lakes and their expansion in the Himalayan region is challenging due to the rugged terrain.
- This is where satellite remote-sensing technology proves to be an excellent tool.
- Analysing changes in glacial lakes using satellite data helps us understand how these lakes are changing over time.
- This information is crucial for figuring out how they affect the environment and for creating plans to manage the risks of glacial lake outburst floods and adapt to climate change in areas with glaciers.

Mitigation of risks posed by glacial lakes -

- As per one study, lowering of the lake levels by 10 to 30 m significantly reduces the impacts on downward towns.
 - Although it does not completely eliminate the risks posed by a GLOM event.
- One way to syphon off lake water is by using long High-Density Polyethylene (HDPE) pipes.
- In 2016, members of the Sikkim State Disaster Management Authority used this method to reduce water levels in Sikkim's South Lhonak Lake.

Green Taxonomy

The RBI and the Finance Ministry could take inspiration from the developing world, especially the ASEAN region, where a layered green taxonomy as a living document keeps getting updated with sectoral views of possible sustainable trajectories.

About Green Taxonomy -

- A green taxonomy is a **framework for defining** what can be called **environmentally sustainable investments**.
 - It is a **classification system** that defines which economic activities and assets are “green” or environmentally sustainable.
- It is a useful instrument and has several complementary purposes –
 - help prevent greenwashing;
 - help investors make informed investment decisions; and
 - channel investment toward sustainable or green economic activities and assets.
- Structurally, all taxonomies are similar. So far, they all **include the goals of climate mitigation and adaptation** and some also include other environmental objectives such as biodiversity conservation, for example.
- To be considered green, an activity must substantially contribute to at least one of the environmental objectives.
- **Often, taxonomies also include “do no significant harm” criteria** (i.e., an activity that substantially contributes to one environmental objective should not harm another environmental objective) and **social safeguards** (i.e., compliance with human rights).
- **Some taxonomies only define what is green and others**, such as the recently launched Indonesian taxonomy or the proposed Singaporean taxonomy, **use a “traffic light” approach**, where the **economic activities are split into different categories** (i.e. green, amber, or red) to classify their environmental sustainability.

What is Greenwashing?

- It is the process of **conveying a false impression** or misleading information about how a company's products are environmentally sound.
- It involves making an unsubstantiated claim **to deceive consumers** into believing that a company's products are environmentally friendly or have a greater positive environmental impact than they actually do.
- In addition, greenwashing may occur when a company attempts to **emphasise sustainable aspects** of a product to overshadow its involvement in environmentally damaging practices.
- Companies can also greenwash initiatives with vague claims that don't provide real data or scientific validation for the claims.

End date for coal-fired power plants

Recently, G7 energy ministers discussed a possible time frame for phasing out coal-fired power plants. The G7 meeting in Turin (Italy) is the first big political session since the world pledged at the UN's COP28 climate summit in December 2023 to transition away from coal, oil and gas.

G7 -

- **Origin —**
 - The origin of G7 lies in the oil shocks of 1973 and the corresponding financial crisis.

- In order to address the situation after oil shock, the heads of the world's six leading industrial nations decided to hold a meeting in 1975.
- These six nations were - the US, UK, France, Germany (West), Japan and Italy.
- These countries were joined by Canada in 1976 and G7 came into existence.
- **Current Members —**
 - US, UK, Canada, France, Germany, Italy and Japan are the current members of this group.
 - It can be said that the members of this group are the most developed and the advanced economies of the world.
 - The European Union is also represented within the G7.
- **Purpose of G7 —**
 - To determine the course of multilateral discourse
 - To shape political responses to global challenges.
 - Basically, G7 provides a platform to discuss and coordinate solutions to major global issues, especially in the areas of trade, security, economics, and climate change.

Coal-fired power plants -

- **About —**
 - Coal-fired power plants, also known as coal-fired power stations, generate electricity by burning coal to produce steam.
 - The steam is then piped into a turbine, which spins a generator to create electricity.
 - The steam is then cooled, condensed back into water, and returned to the boiler to start the process over.
- **Emissions from coal-fired power plants —**
 - Several principal emissions result from coal combustion. These include:
 - Sulphur dioxide (SO₂), which contributes to acid rain and respiratory illnesses
 - Nitrogen oxides (NO_x), which contribute to smog and respiratory illnesses
 - Particulates, which contribute to smog, haze, and respiratory illnesses and lung disease
 - Carbon dioxide (CO₂), which is the primary greenhouse gas produced from burning fossil fuels (coal, oil, and natural gas)
 - Mercury and other heavy metals, which have been linked to both neurological and developmental damage in humans and other animals
 - Fly ash and bottom ash, which are residues created when power plants burn coal
- **Coal fired plants in India —**
 - At present, thermal power accounts for almost 60 per cent of India's total installed power generation capacity.
 - It is produced by burning fossil fuels like coal, gas, etc.
 - Currently, coal-fired power generation provides over 75% of the electricity supplied to the grid.
 - It has been the centre-piece of India's energy ecosystem for several decades largely because it is the cheapest natural resource and is abundant in India.
- **Potential —**
 - India's coal reserves are expected to last 100 years, compared to around 50 years for gas and about 16 years for oil.
 - An expert group formed by NITI Aayog expects India's coal-based power generation capacity to touch 250 gigawatts by 2030 from around 202 gigawatts currently.
 - According to the Draft National Electricity Plan 2022, coal's share in the electricity generation mix will decrease to 50% by 2030, compared to the current contribution of 70%.

Why is the world turning against coal-fired power plants?

- The 2018 report by the IPCC warned against climate changes in the coming decades.
 - It stressed on severely limiting the operation of coal-fired power plants by 2050 to limit global warming.
- Coal-based power plants are also a significant contributor to pollutants such as particulate matter (PM), nitrogen oxides (NO_x) and sulphur dioxide (SO₂).

Phasing out coal-fired power plants and G7 -

- Recently, energy and ecological transition ministers from the G7 met in Turin (Italy). They are close to committing to a common target of shutting down coal-fired power plants.
 - Italy holds the G7 rotating presidency this year.

- The talks come as a new report by a global climate institute shows the G7 is falling far short of its targets.
- This is significant as together the G7 makes up around 38 percent of the global economy and was responsible for 21 percent of total greenhouse gas emissions in 2021.

‘Unclassed’ Forests Missing

In compliance with a Supreme Court order, the Ministry of Environment, Forests and Climate Change (MoEFCC) uploaded the various State Expert Committee (SEC) reports on its website. This interim order was in response to a PIL challenging the constitutionality of the **Forest (Conservation) Act Amendment (FCAA) 2023**.

A key concern in the petition was the **status of unclassified forests** (either not known or not identified at all), which were to be identified by the state SEC reports.

What are Unclassed Forests?

- **Unclassed or deemed forests** may belong to forests, revenue, railways and other government entities, community forests or those under private ownership, but are **not notified**.
- The unclassified forests had **legal protection** under the landmark case - **N. Godavarman Thirumalpad (1996)**.
 - It specified that ‘forests’ as per their dictionary meaning and **all categories of forests** irrespective of ownership and notification status **would be included under the ambit of the Forest (Conservation) Act 1980**.
- **The SEC reports were to be prepared in pursuance of the order**. SECs were to identify all such forests across the country through
 - Available records i.e. Forest Working Plans, Revenue land records, etc., and
 - By physical identification of any land patch having the nature of forests as per dictionary meaning regardless of its ownership.
- As a result, unclassified forests would also **require the Central government approval** in case a project proponent sought to divert that land for non-forest use, after multiple other layers scrutiny.

What does the FCAA Stipulate with respect to Unclassed Forests?

- The FCAA amends the Forest (Conservation) Act 1980 (FCA), which provides that –
 - The dereservation of reserved forests,
 - Use of forest land for non-forest purpose,
 - Assigning forest land by way of lease or otherwise to private entity and
 - Clearing of naturally grown trees for the purpose of reforestation **requires prior permission of the Central Government**.
- **The FCAA amends the FCA to make it applicable to certain types of land**. These include land notified as a forest under the Indian Forest Act, 1927 or in government records after the 1980 Act came into effect.
- **However, the FCAA excludes two categories of land** from its purview –
 - Land recorded as forest before October 25, 1980 but not notified as a forest, and
 - Land which changed from forest-use to non-forest-use before December 12, 1996.
- This provision may go against the 1996 SC judgement on preventing deforestation.
- Hence, with the enactment of FCAA, **the unclassified forest would lose protection provided after the SC’s 1996 verdict**, leading to their inevitable diversion.

Why are ‘Unclassed’ Forests Missing?

- According to the SEC reports uploaded on the website of MoEFCC, **no state has provided verifiable data** on the identification, status, and location of unclassified Forests.
- In fact, 7 states and UTs - Goa, Haryana, Jammu & Kashmir, Ladakh, Lakshadweep, Tamil Nadu, and West Bengal - **appear not to have constituted the SEC at all**.
- Most states have either used existing forest and revenue department data, some (like Manipur and Sikkim) have **merely quoted figures from the Forest Survey of India (FSI)**.
 - The SEC reports also question the veracity of the reports of the FSI, the only government

agency to survey and assess forests.

- A striking example comes from **Gujarat**, whose SEC report says its unclassed forests cover 192.24 sq. km while the Survey has reported the significantly higher 4,577 sq. km (1995-1999).
- Also, almost **no state or UT specified the geographic locations of forests.**

Consequences of Missing Forests and way forward -

- **The treatment of SECs without on-ground verification** is likely to have resulted in the **large-scale destruction of forests**, which ought to have been identified, demarcated and protected 27 years ago (after 1996 verdict).
- Promulgating the FCAA without examining the SEC reports **displays a lack of diligence on the MoEFCC's part** and will have terrible consequences for India's ecosystems and **ecological security.**
- **Those responsible need to be held to account** and the national government needs to take ameliorative action to re-identify, retrieve and protect forest areas as per the 1996 judgement.
- **The failure to do this is a lost opportunity** to achieve the requirements of the Indian Forest Policy, which envisages 33.3% forest cover in plains and 66.6% in the hills.

Red Colobus

A new study by an international team of scientists stated conserving Red colobus could hold the keys to protecting tropical forests.

About Red Colobus -

- These are a rare group of **imperilled monkeys spread across Africa**, are primary indicators of biodiversity.
- Red colobus monkeys are one of **two major simian groups globally.**
 - **Colobines** are primarily leaf-eaters, as compared to the **cercopithecines**, which are **omnivores** and thus include animals in their diet as well.
 - Colobines also include the **langurs of south and southeast Asia** besides Africa's colobus (olive and black-and-white besides red) monkeys.
- **Distribution** — Ranging from forests in **Senegal to the Zanzibar Archipelago.**
- Most red colobus are facing extinction, making them the most threatened group of non-ape primates in mainland Africa.
- More than half of the 18 distinct forms of red colobus monkeys (scientists are unclear about how many species there are) are classified as Endangered or Critically Endangered on the IUCN Red List of Threatened Species.
- **Threats** —
 - Hunting for trade and local subsistence.
 - Habitat loss, degradation and fragmentation due to logging, mining, charcoal production, infrastructure development and conversion of forest to farms and agriculture plantations.

Initiative to conserve Red Colobus -

- The **Red Colobus Conservation Action Plan**, initiated by the **International Union for Conservation of Nature (IUCN)** Species Survival Commission Primate Specialist Group and the African Primatological Society.
 - The action plan aims to make red colobus a priority conservation target, which will help to secure Africa's tropical forests and reduce unsustainable hunting for wild meat.
 - A **Red Colobus Working Group (RCWG)** has been formed to guide implementation of the action plan and a **Red Colobus Conservation Network (RCCN)** has been created to promote **communication, capacity-building and monitoring** of red colobus conservation efforts.

Haritha Karma Sena

Waste management in Kerala is a model for other States and the functioning of Haritha Karma Sena is exceptional.

What is Haritha Karma Sena (HKS)?

HKS is a professional team consisting of **Green Technicians and Green Supervisors**, mainly **Kudumbashree Women**. They are assigned with the responsibility of **collection, transportation, processing, recycling/disposal and management of waste materials** in association with respective Local Self-Governments. It was launched in **2013** by the **Government of Kerala** as a part of the **Haritha Keralam Mission**.

What is the Haritha Keralam Mission?

It is a comprehensive program to **make Kerala a clean and green state**. It aims to make Kerala a **garbage-free state, promote sustainable waste management practices, create employment opportunities** in the waste management sector and raise awareness.

What is the Success Story of the HKS?

The 35,500 members of the HKS have been **involved in a tireless effort to change people's approach to handling household waste**. Waste collection and segregation have now emerged as a **respectable paying job**. The shift from centralised waste treatment to **decentralised management** underscores a **community-driven approach** to sustainability. **Kudumbashree's role** in empowering women and the **government's focus** on awareness and training are key to sustaining these efforts.

What more needs to be done?

Future plans aim to enhance segregation methods, encourage diversification, and expand infrastructure for waste storage, reflecting a **holistic approach to waste management and economic development**.

Climate Technology Centre and Network

The Climate Technology Centre and Network (CTCN) recently marked its 10-year anniversary.

About Climate Technology Centre and Network (CTCN) -

- It is the **operational arm** of the United Nations Framework Convention on Climate Change's (UNFCCC) Climate Change Technology Mechanism.
- It is **hosted by UN Environment (UNEP)** in collaboration with the United Nations Industrial Development Organization (UNIDO) and with the support of 11 independent organisations having expertise in climate technologies.
- It was established to **accelerate the development and transfer of environmentally sound technologies** for low-carbon and climate resilient development at the request of developing countries.
- It **provides technology solutions, capacity building, and advice on policy**, legal, and regulatory frameworks tailored to the needs of individual countries by harnessing the expertise of a global network of technology companies and institutions.
- It is a **demand-driven mechanism** as its services are offered upon request by developing countries, and the volume and specific nature of activities ultimately depends on countries' requirements and needs.
- It **consists of two parts**: a centre—a coordinating entity located in UN City Copenhagen—and a worldwide network of organisations that delivers CTCN services—both virtually and actually.

La Cumbre Volcano

Recent lava spewing from La Cumbre volcano on Galápagos Islands destroying habitat of rare land iguanas.

About La Cumbre volcano -

- It is **located on Fernandina Island** - the third largest island in the Galápagos Islands.

- It lies directly atop the mantle plume, or hot spot, that produced all of the Galápagos Islands. It is located around 1,125 kilometres off **mainland Ecuador** and erupted for the first time since 2020.
- The volcano **has a large crater**, or caldera, at its summit that harbors a permanent **crater lake**. This lake attracts a wide variety of animals including tens of thousands of **Galápagos land iguanas** (*Conolophus subcristatus*) that lay their eggs in nests within the caldera.

Key facts about Galápagos land iguana -

- It is one of three species of land iguana **endemic to the Galapagos Islands** (the others being the Santa Fe land iguana and the Galapagos pink land iguana).
- It is a very large **species of lizard** in the family Iguanidae. It is primarily an **herbivores species**.
- This large cold-blooded reptile has a **mutualistic relationship with finches**, which can often be seen sitting on their backs, picking ticks from between their scales.
- It is active during the day spending their time foraging or basking on rocks; at night they sleep in burrows.
- **Conservation status —**
 - **IUCN:** Vulnerable

Taam Ja' Blue Hole

Scientists have yet to reach the bottom of the Taam Ja' Blue Hole in Mexico's Chetumal Bay, which new measurements hint could be connected to a labyrinth of submarine caves and tunnels.

What is a Blue Hole?

- They are **water-filled vertical caverns, or sinkholes**, found in coastal regions where the bedrock is made of soluble material, such as limestone, marble, or gypsum.
- They form when water on the surface percolates through the rock, dissolving minerals and widening cracks, which eventually causes the rock to collapse.
- Famous **examples** include Dean's Blue Hole in the Bahamas, the Dahab Blue Hole in Egypt, and the Great Blue Hole in Belize.

About Taam Ja' Blue Hole -

- It is the **deepest known underwater sinkhole** in the world.
- It sits in **Chetumal Bay** off the **southeast coast** of the **Yucatan Peninsula in Mexico**.
It is 390 feet (119 m) deeper than the **previous record holder**— the 990-foot-deep (301 m) **Sansha Yongle Blue Hole**, also known as the **Dragon Hole**, in the **South China Sea**.
- Spread over an area of 13,660 square meters, the giant, underwater cavern has been named Taam Ja' which means "deep water" in Mayan.
- The submerged blue hole has a **nearly circular shape at its surface** with **steep sides** that form a large conic structure covered by biofilms, sediments, limestone, and gypsum ledges.

About Yucatan Peninsula -

- It is a **northeastern projection of Central America**, extending into the Atlantic Ocean.
- The Gulf of Mexico lies on its western and northern sides. The Caribbean Sea lies on its eastern side. The northern part of Yucatán is in Mexico. Belize and a part of Guatemala are in the south.
- The peninsula is almost wholly **composed of beds of coralline and porous limestone rocks**.

Goldman Environmental Prize

Alok Shukla, convenor of the Chhattisgarh Bachao Andolan and founding member of the Hasdeo Aranya Bachao Sangharsh Samiti, has been awarded the 2024 Goldman Prize from Asia.

About Goldman Environmental Prize -

- It recognises individuals for sustained and significant efforts to **protect and enhance the natural environment**, often at great personal risk. It is also known as the **Green Nobel**.

- It recognises **grassroots environmental heroes** from roughly the world's six inhabited continental regions: Africa, Asia, Europe, Islands & Island Nations, North America and South & Central America.
- The Goldman Prize views "grassroots" leaders as those **involved in local efforts**, where positive change is created through community or citizen participation.
- The first Goldman Environmental Prize ceremony took place on **April 16, 1990**. It was timed to coincide with **Earth Day**.

About Hasdeo Aranya region -

- It is a sprawling forest in the **northern part of Chhattisgarh** which is known for its biodiversity and also its coal deposits.
- The forest falls under Korba, Surajpur and Sarguja districts with sizeable tribal population. The **Hasdeo River**, a **tributary of Mahanadi**, flows through it.
- It is the largest un-fragmented forests in Central India consisting of **pristine Sal** (*Shorea robusta*) and **teak forests**.

Peucetia chhaparajirvin

Daryapur-based arachnologist recently identified a green lynx spider, named *Peucetia chhaparajirvin*, which was never discovered earlier.

About Peucetia chhaparajirvin -

- It is a **new species of green lynx spider**. The spider was found in **Tal Chhapar Wildlife Sanctuary** in Churu district of **Rajasthan**.
- The spider species has been named *Peucetia chhaparajirvin* after the area in Rajasthan, Tal Chhapar, where it was discovered.
- This spider is found on the **green leaves of the Vachellia nilotica (babul) tree**.
- Their **green hue aids in blending with their surroundings** and ambushing prey, while their **long legs** allow them to **move quickly**.
- This spider is **nocturnal** and **feeds on small insects**.

What are Lynx Spiders?

- Lynx spiders, (family Oxyopidae) are any of several groups of **active spiders**(order Araneida) that **do not build a nest or web** but **capture their prey by pouncing upon them**.
- They are among the **major predators of insects** occurring in **low shrubs and herbaceous vegetation**.
- The **eyes are arranged in a hexagon**, and the abdomen usually tapers to a point.
- Many Lynx spider species have colorfully striped abdomens and **spiky legs**.

Thar Desert

There is growing evidence to suggest that the Thar Desert could undergo a surprising future transformation: it could become greener.

About Thar Desert -

- It is one of the **largest subtropical deserts** in the world. It is located partly in **northwestern India**, and **partly in eastern Pakistan**.
- It extends across the states of **Rajasthan, Gujarat**, and **Haryana** in India, and the provinces of **Sindh and Punjab in Pakistan**. The majority of the Thar desert is in India (15 percent lies in Pakistan).
- It is **bordered by** the irrigated **Indus River plain** to the west, the **Punjab Plain** to the north and northeast, the **Aravalli Range** to the southeast, and the **Rann of Kachchh** to the south.
- It is separated from the Greater Rann of Kutch to the west by the low-lying marshy lands of the **Luni River**.
- Climate —

- The desert features a **hot and arid climate**, with temperatures often reaching over 50 degrees Celsius during the day and dropping significantly at night.
- **Rainfall is scarce**, with the majority of the desert receiving less than 50mm of rain annually.
- Landscape —
 - It is characterised by a **vast and rugged landscape**, with a variety of different terrains.
 - It is known for its **vast expanses of rolling dunes**, which can reach heights of up to 200 meters.
 - The desert is also characterised by **rocky outcroppings**, which are clusters of large rocks that rise from the desert floor.
 - It is also home to **large salt flats**, which are areas of flat land covered with a layer of salt.
 - **Large, flat plains**, which are covered with a thin layer of soil and vegetation, are also found here.
- Mineral Resource —
 - It is rich in a variety of minerals, including one **of the largest coal reserves** in India.
 - It is also a major source of **gypsum, Limestone, salt, Bauxite, silica**, etc.

Dooars

This year, 2024, marks 150 years of tea production in the Dooars area, as the first tea plantations in the region were set up in 1874, a few decades after Darjeeling.

About Dooars -

- These are **alluvial floodplains in northeastern India** that lie south of the outer foothills of the Himalayas and Brahmaputra plain.
- It is about 30 km wide and stretches over about 350 km from the **Teesta River in West Bengal to the Dhansiri River in Assam**. It forms the gateway to Bhutan, Sikkim and Eastern Nepal.
- It is divided by the **Sankosh River into Eastern** and Western Dooars, consisting of an area of 880 km². The Western Dooars are also known as the Bengal Dooars and the Eastern Dooars also as the Assam Dooars.
- Significance of Dooars —
 - The deep, well drained and fertile soil rich in humus of the Dooars has been used for the developed for the tea plantations.

Chakisaurus Nekul

Palaeontologists from Argentina announced the discovery of a new medium-sized herbivorous dinosaur and named it as Chakisaurus nekul.

About Chakisaurus nekul -

- Its name derived from **Chaki**, which is a word from the **Aonikenk language**, of the indigenous **Tehuelche** people, which means "old guanaco", a reference to a medium-sized herbivore mammal found in the region. **Nekul** means "fast" or "agile" in the **Mapudungún language**, of the local **Mapuche people**.
- It was a fast runner and lived about 90 million years ago in the **Late Cretaceous period** in present day Patagonia.
- It was found in the **Pueblo Blanco Natural Reserve**, in the southern province of Río Negro, an area rich in fossils where many mammals, turtles and fish have been found along with other species of dinosaur.
- This new species was a **bipedal herbivore** that among its most important characteristics had a tail that, unlike other dinosaurs, which was horizontal, had a downward curvature.

Great Rift Valley

Many people died when a dam burst its banks near a town in Kenya's Rift Valley, as heavy rains and floods battered the country.

About Great Rift Valley -

- It is one of the **most extensive rifts** on Earth's surface that runs along part of **East Africa**. It is **part of** a larger feature called the **East African Rift System (EARS)**.
- It runs **from Jordan** in southwestern Asia to the coast of the Indian Ocean in central **Mozambique**.
- It runs **across many countries**: Eritrea, Djibouti, Ethiopia, Kenya, Tanzania, Uganda, Rwanda, Burundi, the Democratic Republic of the Congo (DRC), Malawi, Zambia, and Mozambique.
- Formation —
 - The valley is situated in a region where three tectonic plates meet.
 - It was formed about **40 million years ago when tectonic plates split** and gave rise to the East African Rift.
- The area is **geologically active** and features volcanoes, hot springs, geysers and frequent earthquakes.
- A **series of some thirty lakes** lies along its length; the three largest in Africa are known as the Great Lakes and include Lake Tanganyika, the second deepest lake in the world, and Lake Victoria, the second-largest freshwater lake by surface area in the world.
- Many of **Africa's highest mountains** — including Mount Kilimanjaro, Mount Kenya, and Mount Margherita—are in ranges fronting the Rift Valley.

What is a Rift Valley?

- A rift valley is a **lowland region** that **forms where Earth's tectonic plates move apart**, or rift. They are found on land and at the bottom of the ocean, where they are created by the process of seafloor spreading.
- They **differ from river valleys** and glacial valleys in that they are created by tectonic activity and not the process of erosion.

Chambal River

A group of environmentalists have raised concerns regarding increasing pollutants in the Chambal River.

About Chambal River -

- It is an important river in the Malwa plateau and a principal **tributary of the Yamuna River**, thus forms part of the greater **Gangetic drainage system**. It flows through Madhya Pradesh, Rajasthan and Uttar Pradesh.
- Course —
 - It rises in the **Vindhya Range** just south of Mhow, in western Madhya Pradesh.
 - From its source, it **flows north into southeastern Rajasthan**.
 - Turning northeast, it flows past Kota and along the Rajasthan-Madhya Pradesh border; shifting east-southeast, it forms a portion of the Uttar Pradesh-Madhya Pradesh border and flows through Uttar Pradesh to empty into the Yamuna.
- To its south, east and west, the basin is defined by the Vindhyan mountain ranges, while the north-western boundary is marked by the Aravalli range.
- Tributaries — The main tributaries of Chambal include the **Banas** and **Mej** rivers on the left and the **Parbati**, **Kali Sindh** and **Shipra** rivers on the right.
- Major Dams — Gandhi Sagar Dam, Rana Pratap Sagar Dam, and Jawahar Sagar Dam.
- National Chambal Sanctuary —
 - It encapsulates a **significant segment of the Chambal River**, spanning from the Jawahar Sagar Dam in Rajasthan to the Chambal-Yamuna confluence in Uttar Pradesh.
 - It was established with the imperative **to restore ecological equilibrium** to a crucial north Indian river system and to provide comprehensive **protection to** the highly **endangered gharial**.

Salmonella

The United States has reportedly refused almost a third of shipments from MDH since October

2023 due to salmonella contamination.

About Salmonella -

- It is a **group of bacteria** that can cause **gastrointestinal illness** and fever called salmonellosis. It naturally **lives in animals' intestines** and can be found in their faeces.
- The bacteria then spread to humans if they come in contact with salmonella-infected animals or items in their environment.
- It is a **ubiquitous and hardy bacteria** that can survive several weeks in a dry environment and several months in water.
- **Risks associated with Salmonella —**
 - People infected with Salmonella might have **diarrhoea, fever, and stomach** Some people—especially children younger than 5 years old, adults 65 years and older.
 - People with weakened immune systems—may experience more severe illness that requires medical treatment or hospitalisation.

SCIENCE AND TECHNOLOGY

Indian Ocean Floor Mapping

Recently, a study of the Indian Ocean floor or the bathymetry was undertaken by scientists of the Indian National Centre for Ocean Information Services (INCOIS).

The study - '**Impact of bathymetry on Indian Ocean circulation in a nested regional ocean model**' highlights the importance of bathymetry in ocean models to understand ocean movements better. This understanding is crucial for improving forecasts related to ocean conditions, weather, and climate, especially for Indian ocean rim countries and subcontinent.

Bathymetry -

- It is the study and mapping of the depth of water in oceans, rivers, lakes, and streams.
- Bathymetric maps are similar to topographic maps, which use lines to show the shape and elevation of land features. On bathymetric maps, the lines connect points of equal depth.
- Bathymetry is the foundation of the science of hydrography, which measures the physical features of a water body.
 - Hydrography includes not only bathymetry, but also the shape and features of the shoreline; the characteristics of tides, currents, and waves; and the physical and chemical properties of the water itself.

Indian National Centre for Ocean Information Services (INCOIS) -

- INCOIS is an autonomous organisation of the Government of India.
- It provides ocean information and advisory services to the scientific community, industry, government agencies, and society.
- INCOIS is a unit of the Earth System Science Organisation (ESSO) and was established in 1999 under the Ministry of Earth Sciences (MoES).
- It is located in Hyderabad.

Key highlights of the study -

- **The Contrasting Currents of the Indian Ocean —**
 - The Indian Ocean's currents are not solely governed by surface influences.
 - The study suggests that both the Andaman and Nicobar Islands and the Maldives islands play pivotal roles in altering the direction and speed of these currents, particularly in the deep ocean.
 - Interestingly, these submerged dynamics often contradict the movements observed at the ocean's surface, revealing a complex interplay between various oceanic forces.
- **Revolutionising Ocean Modelling: Correcting Coastal Currents Around India —**
 - The study revealed significant discrepancies in previously employed ocean modelling systems, particularly in their representation of coastal currents around India.
 - Through comprehensive bathymetry studies, notable enhancements have been achieved in accurately depicting **upper ocean characteristics** including salinity, temperature, and currents, particularly in coastal regions.

- A more realistic East India Coastal Current (EICC) flow was estimated at 1,000 metres and 2,000 metres depth, which is opposite to that of the surface.
- **Insights from Andaman, Nicobar, and Maldives —**
 - The study uncovered a significant boundary current tracing the coast of the Andaman and Nicobar Islands at a depth of 2,000 meters, shedding light on previously unrecognised deep-sea dynamics.
 - Moreover, the presence of the Maldives Islands emerges as a key factor in extending the **Equatorial Under Current (EUC)**
 - EUC is a strong, narrow, eastward-flowing current that's located in the upper thermocline, centred on the equator.
 - It's a permanent feature of the Atlantic and Pacific oceans, and is also present in the Indian Ocean during the northeast monsoon in the spring and winter.
 - Notably, seasonal variations in the EUC's characteristics have been identified, with a more defined structure observed during the fall months in the eastern Equatorial Indian Ocean, at depths ranging from 50 to 100 meters.
 - However, in spring, it's a bit deeper, around 100 to 150 meters.
- **The Crucial Role of Ocean Forecasting in Weather, Climate, and Industry —**
 - Oceans significantly influence weather, climate, and the maritime sector.
 - This highlights the need for precise forecasts of oceanographic parameters like currents, temperature, and salinity across various time frames.
 - Achieving accurate predictions relies on bolstered observations and refined modelling techniques, essential for supporting both economic activities and scientific understanding.

Raman spectroscopy

Researchers recently used a non-invasive laser technique known as Raman spectroscopy to identify the origin of a piece of ivory, enabling customs and law enforcement agencies to distinguish between ivory from extinct mammoths and living elephants.

About Raman Spectroscopy -

- It is an analytical technique where **scattered light** is used to measure the vibrational energy modes of a sample.
- It involves **illuminating a substance** with a laser and analyzing the light that is scattered off the surface of the substance. It is based on the interaction of light with the chemical bonds within a material.
- It can **provide both chemical and structural information**, as well as the identification of substances through their characteristic Raman 'fingerprint'.
- Raman spectroscopy extracts this information **through the detection of Raman scattering** from the sample.
- In 1928, Sir C.V. Raman introduced the "**Raman effect**," for which he was given the Nobel Prize in Physics in 1930.
- What is the Raman Effect?
 - It is a **change in the wavelength** of light that occurs when a light beam is deflected by molecules.
 - When a beam of light traverses a dust-free, transparent sample of a chemical compound, most of the scattered light is at the same wavelength (or colour) as the laser source and does not provide useful information; this is called **Rayleigh Scatter**.
 - However, a small amount of light (typically 0.0000001%) is scattered at different wavelengths (or colours), which depend on the chemical structure of the analyte; this is called **Raman Scatter**.

Sympathetic Solar Flare

A rare "super-sympathetic" solar flare event featuring four simultaneous eruptions, was recently observed by astronomers.

What are Solar Flares?

- A solar flare is an **intense burst of radiation** coming from the release of magnetic energy associated with sunspots. They 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 of Solar Flare 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.

About Sympathetic Solar Flare -

- It occurs **when sunspots** or filaments **are invisibly linked by massive magnetic field loops** that arch above the solar surface. When one flare detonates, the others follow in rapid succession.
- Sympathetic solar flares **typically involve just two linked flares**, ranging in intensity from minor outbursts to X-class flares, the most powerful class of solar flares.
- They are **more likely to happen during or around the solar maximum**, the most active phase of the Sun's approximately 11-year solar cycle.

Liquid Nitrogen

The commissioner of food safety in Tamil Nadu has directed officials to monitor use of liquid nitrogen in food items and take action against those violating the Food Safety and Standards Act, 2006.

About Liquid Nitrogen -

- It is an inert, colourless, **odourless, noncorrosive, nonflammable** and extremely cold element.
- It is a **cryogenic liquid** (Cryogenic liquids are liquefied gases that have a normal boiling point below -130°F (-90°C). Liquid nitrogen has a boiling point of -320°F (-196°C).
- Health impacts —
 - Liquid nitrogen can **scorch the organ** or part of the body it contacts, making it appear like frost bites.
 - It can **damage the lips, tongue, throat**, lungs and stomach. It may cause lesions or burn tissues.
 - If it reaches the stomach, the organ could get perforated. In the lungs, it **could produce CO₂** and the person could become unconscious.
- Applications —
 - It is used to cool and **freeze food rapidly**. In food production and industrial processes, a cooling tray filled with liquid nitrogen is used to rapidly cool materials or equipment by immersing the product in nitrogen.
 - In the wellness and sports industry, **cryosaunas** with liquid nitrogen vapour are used for
 - Liquid nitrogen test chambers are used in **technology and material sciences** to test the **performance and durability of materials** and devices at extremely low temperatures.

Antares

The Bengaluru-based Indian Institute of Astrophysics (IIA) has filmed the passing of the moon in front of Antares, a bright red star.

About Antares -

- Antares, also known as **Alpha Scorpii**, is the alpha, or **brightest, star in the constellation**

Scorpius, and the **15th-brightest star** in the whole night sky.

- It is a massive **red supergiant star**. It is **10,000 times brighter** than our sun.
- It is one of the largest known stars, **700 times the sun's diameter**, large enough to engulf the orbit of Mars if the solar system were centred on it.
- Despite its size, the **overall density** of Antares is **less than one-millionth** that of the sun.
- Antares is also **relatively cool** as stars go. Its **surface temperature** is **about 6,100 degrees F** (3,400 degrees C). That's in **contrast to our sun's** surface temperature of about **10,000 degrees F** (5,500 degrees C).
- The star's low temperature **accounts for its ruddy colour**.

What is a Red Supergiant star?

- They are **very large stars** that are **approaching the later stages of their stellar life**.
- They have a **radius** that is **several hundred to 1500 times that of the Sun**.
- Though they are great in size, the **red colour indicates** that stars of this type have a relatively **low surface temperature**.
- They are **highly luminous**.
- Most red supergiants are **variable stars**. This means, their **degree of brightness** changes and **fluctuates as seen on Earth**.
- Also, these stars are **actively losing mass**. Nebulae have been seen around them as they expel material.

ISRO's Space Application Centre

A study carried out by the scientists at the Space Applications Centre suggests that the extent of water ice in the northern polar region is twice that in the southern polar region of the Moon.

About Space Applications Centre (SAC) -

- It is a major **research and development centre** of the Indian Space Research Organisation (ISRO). Located in **Ahmedabad, Gujarat**, SAC is spread across two campuses with multi-disciplinary activities.
- Genesis —
 - The genesis of the centre dates back to **1966**, with the **establishment of the Experimental Satellite Communication Earth Station (ESCES)** by the late **Vikram Sarabhai** in Ahmedabad.
 - Later in **1972**, the **different units of ISRO in Ahmedabad** pursuing research in applications of space technology **were merged to form SAC**.
- The core competence of the centre lies in the **development of space borne and air borne instruments/payloads** and **their applications** for national development and societal benefits.
 - These applications are in diverse areas and primarily meet the **communication, navigation, and remote sensing needs** of the country.
- Besides these, the centre also contributes significantly to scientific and **planetary missions of ISRO** like Chandrayan-1, the Mars Orbiter Mission, etc.
- The **communication transponders developed at this Centre** for Indian National Satellite (INSAT) and Geo Synchronous Satellite (GSAT) series of satellites are used by the government and private sector for VSAT, DTH, Internet, broadcasting, telephones, etc.
- This centre also **designs and develops** the **optical and microwave sensors** for the satellites, **signal and image processing software**, **GIS software**, and many **applications for the Earth Observation (EO) programme** of ISRO.
 - These applications are in diverse areas of Geosciences, Agriculture, Environment and Climate Change, Physical Oceanography, Biological Oceanography, Atmosphere, Cryosphere, Hydrosphere, etc.
- Facilities — The facilities at SAC include highly sophisticated **payload integration laboratories**, electronic and mechanical **fabrication facilities**, **environmental test facilities**, systems reliability / assurance group, image processing and analysis facilities, project management support group, and a well-stocked library.

- SAC is a host institution for the **training programmes for students from the Asia Pacific region** under the aegis of the Centre for Space Science and Technology Education in Asia and the Pacific (CSSTE-AP) in **satellite meteorology and communication**.

Advanced Composite Solar Sail System

NASA successfully launched its Advanced Composite Solar Sail System spacecraft from New Zealand recently.

About Advanced Composite Solar Sail System (ACS3) -

- It is a **NASA technology demonstration mission** designed to characterise **solar sail structures technologies** for future small spacecraft to engage in deep space missions requiring long-duration, low-thrust propulsion.
- Launched in 2024, ACS3 will **deploy a sail about the size of a small apartment** from a toaster oven-size spacecraft.
 - **At its core, ACS3 is a CubeSat**, a small satellite built to standardised dimensions. It **features four 7 m long deployable composite booms**.
- Just as a sailboat is powered by wind in a sail, **solar sails employ the pressure of sunlight for propulsion**, eliminating the need for conventional rocket propellant.
 - **Space missions have demonstrated that small spacecraft can use solar sails** to change their orbits, expanding their possible uses.
 - Future solar sail missions will need bigger sails and lighter materials to maximise their performance.
- ACS3 **uses lightweight carbon fiber sail booms** instead of traditional metal booms.
- This will be the **first test of this technology in space**.
- What is solar sailing?
 - Light is made up of particles called photons. **Photons don't have mass, but they have momentum**.
 - **As sunlight reflects off a shiny solar sail, some of its momentum gets transferred, giving the sail a small push**.
 - **This push is slight but continuous** and, **over time, can impart more thrust to a spacecraft** than traditional chemical rockets.
 - Solar sails **can reach unique destinations** that are difficult or impossible to access with other propulsion systems.
 - This may also be the **best option for interstellar travel**.

Adsorption

Scientists have conducted research on a nano-material-based adsorption process to efficiently remove uranium wastewater extracted from actual radioactive-contaminated soil.

About Adsorption -

- It refers to the **adhesion of atoms, ions, or molecules** from a gas, liquid, or dissolved solid **to the surface of a material**.
- It is considered a **surface phenomenon** that **creates a film of the adsorbate on the surface of the adsorbent** (a solid material, for instance).
- **Materials that are used to adsorb** gases or dissolved substances are called **adsorbents**; the **adsorbed molecules** are usually referred to collectively as the **adsorbate**.
- How Adsorption Works?
 - Adsorption **depends on surface energy**.
 - **The surface atoms of the adsorbent are partially exposed**, so they can **attract the adsorbate**
 - Adsorption may **result from electrostatic attraction, chemisorption, or physisorption**.
- Characteristics of Adsorbents —
 - Typically, adsorbents have **small pore diameters** so that there is a **high surface area to facilitate adsorption**.

- The pore size usually ranges between 0.25 and 5 mm.
- Industrial adsorbents have **high thermal stability** and **resistance to abrasion**.
- **Depending on the application**, the surface may be **hydrophobic or hydrophilic**.
- The adsorbents **come in many shapes**, including rods, pellets, and molded shapes.
- **Examples** of adsorbents include **Silica gel, Alumina, Activated carbon or charcoal, Zeolites**, Adsorption chillers used with refrigerants, Biomaterials that adsorb proteins, etc.
- Adsorption is a **different process from absorption**, in which a **substance diffuses into a liquid or solid to form a solution**.
- Adsorption phenomena are **operative in most natural physical, biological, and chemical systems**, and adsorption operations employing solids such as activated carbon and synthetic resins are **widely used in industrial applications and for the purification of waters and wastewaters**.

Magnetar

Scientists have now detected the most distant-known instance of eruptions, called a giant flare, from a magnetar residing in a galaxy called Messier 82.

About Magnetar -

- It is an exotic **type of neutron star** with the 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.

What is Messier 82?

- It is a galaxy nicknamed as "**cigar galaxy**" because when viewed edge-on it has an elongated and cigar-like shape. It is 12 million light-years from Earth in the **constellation Ursa Major**.
- The M82 giant flare was the most distant known but not the most energetic.
- A giant flare originates from a **reconfiguration and a reconnection of the magnetic field** of the magnetar.

Antihistamines

Antihistamines are common drugs that can be purchased without a prescription and are used to treat short-lived allergic reactions, like a sneezing fit or an itch.

About Antihistamines -

- An antihistamine drug acts against the activity of the **histamine receptor** – proteins that bind to a compound in the body called histamine. This compound consists of two attached to each other: **ethylamine** (CH₃CH₂NH₂) and **imidazole** (C₂N₂H₄), the latter being a ring.
- Depending on its location, histamine performs broadly four types of functions, each involving different histamine receptors **called H1, H2, H3 and H4**.
 - The **H1 receptor** is found mostly in the **inner surface of blood and lymphatic vessels**, neurons, and smooth muscle cells.
 - H1 antihistamines are used to block the **effects of minor allergies**. Certain cells in the gastric glands release histamine, which encourage nearby parietal cells with H2 receptors to release gastric acid for digestion

- H3 receptors are located in cells in the **central nervous system**, where they use histamine to regulate the release of other neurotransmitters, including dopamine and serotonin.
- Similarly, H4 receptors use histamine to **regulate the body's inflammatory** response, including allergic reactions as well.
- Currently, there is a lot of research ongoing on H3 and H4 receptors, in particular to alleviate the effects of neurological and immunological disorders, respectively, using specialised drugs.

Mephedrone

The Narcotics Control Bureau (NCB) has busted a network of clandestine mephedrone manufacturing laboratories in Gujarat.

About Mephedrone -

- It also known as 4-methylmethcathinone, 4-MMC and 4-methylephedrone. It is a **synthetic stimulant drug** of the **amphetamine and cathinone classes**.
 - **Other names:** drone, M-CAT, white magic, 'meow meow', and bubble.
- It has a role as a xenobiotic and an environmental contaminant. It has been linked to a **range of adverse effects** on both physical and mental health.
- Users commonly report increased alertness, euphoria and enhanced sociability, but these positive effects come at a cost.
- **Health impacts —**
 - Anxiety, paranoia, nausea and insomnia are among the negative side effects experienced by individuals under the influence of this synthetic stimulant.
 - Prolonged use has been associated with more severe consequences, including **cardiovascular issues, hallucinations** and even instances of aggressive behaviour.
 - The drug's impact on mental health raises concerns about its potential for addiction and long-term psychological harm.
- It is **banned in India** under the Narcotic Drugs and Psychotropic Substances Act, 1985.

Opioids

Recently, the US Secretary of State Anthony Blinken's three-day visit to China spoke about the production and export of "synthetic opioid precursors", specifically the drug fentanyl.

About Opioids -

- These are a **class of drugs** that derive from or mimic, natural substances found in the opium poppy plant. They **activate an area of nerve cells** in the brain and body called opioid receptors that block pain signals between the brain and the body.
- They produce a variety of effects, including pain relief and euphoria and are highly addictive. Some common opioids include **oxycodone, morphine, codeine, heroin and fentanyl**.
- **Opioid overdose —** It **can lead to death** due to the effects of opioids on the part of the brain which regulates breathing.
 - An opioid overdose can be identified by a combination of three signs and symptoms: pinpoint pupils, unconsciousness and difficulties with breathing.

What is Fentanyl?

- It is a potent synthetic opioid drug approved by the Food and Drug Administration for use as an **analgesic (for pain relief) and anaesthetic**.
- It is approximately 100 times more potent than morphine and 50 times more potent than heroin as an analgesic.

TacticAI

Google's DeepMind developed and evaluated TacticAI in a multi-year research collaboration with experts from Liverpool Football Club.

About TacticAI

- It is an **AI system** that can provide experts with tactical insights, particularly **on corner kicks** (football), through predictive and generative AI. It can be used by football team managers as an assistant for tactics. It is developed by **Google's DeepMind**.
- It has been incorporated both a **predictive and generative component** to allow coaches to effectively sample and explore alternative player setups for each corner kick and to select those with the highest predicted likelihood of success.

Why specifically corners?

- Corner kicks are apt for strategising by leveraging AI tools, primarily because they are moments when the game is effectively frozen – and always **starts from the same kind of position at the corner of the pitch** while giving players an immediate opportunity to score.
- Strategies for corners are usually also decided long before the players actually go on to the pitch, so that there is no confusion on match day.
- For every corner kick, AI can help- 1) understand what will happen and what happened; and 2) how to adjust tactics to make a particular outcome happen.
- **What is a corner shot in football?** A corner is awarded when the ball passes over the goal line after touching a player of the defending team.

ART AND CULTURE

Patachitra Painting

The first-generation women patachitra artists of West Bengal's village of Naya are selling their work online and are being recognised the world over.

About Patachitra Painting -

- It is a general term for **traditional, cloth-based scroll painting** based in the eastern Indian states of **Odisha and West Bengal**. It is believed to have originated as early as the **12th century**.
- In the Sanskrit language, "Patta" literally means "cloth" and "Chitra" means "picture".
- It is known for its **intricate details** as well as the **mythological narratives** and **folktales** inscribed in it. Most of these paintings **depict stories of Hindu deities**.
- It is one of the **ancient artworks of Odisha**, originally created for **ritual use and as souvenirs for pilgrims to Puri**, as well as other temples in Odisha.
- Patachitras are a **component of ancient Bengali narrative art**, originally serving as a visual device during the performance of a song.
- **Making —**
 - Patachitra paintings are **made on a special canvas** where cotton sarees **are** layered with tamarind paste and then coated with clay powder.
 - **Traditionally, cotton canvas was used**; now, both cotton and silk canvas are used for paintings.
 - Once the canvas becomes sturdy, **colours are filled in directly without any initial sketches**. It is a **tradition to complete the borders** of the painting **first**.
 - **All colours are obtained from natural sources** like lamp soot and powdered conch shells.
 - Each painting can take up to weeks or **months to be prepared**.

Alagar Temple

The procession of lord Kallalagar from Alagar hills entered Vaigai river as part of Chithirai festival in Madurai.

About Alagar Temple -

- It is also known with the name of **Azhagar Kovil** is one of the prominent temples situated at the foothills of Alagar hills in the state of Tamil Nadu.
- It is **dedicated to Lord Vishnu** and is known for its intricate sculpting and mandapams. It was

mentioned in epic such as **Silappathikaram**

- Alvars like Thirumangai Alvar, Peri Alvar, Nammalvar, Bhoothathalvar, Peyalwar, Andal have also mentioned the glorious history of shrine in their songs.
- There are also inscriptions dating back to King Ashoka rule. It is said that great **Jain monk Ajjanandi** had resided here along with his disciples. It had a prominent place during the **Pandyan reign**.
 - It was during the rule of King **Jatavarman Sundara Pandyan** (1251-1270 A.D) vimana of the **temple's sanctum sanctorum** was beautified with gold plates.
 - The massive tower which is seen at the entrance of the temple was also built during the reign of Pandyan kingdom.
- King **Thirumalai Naickar of Nayaka dynasty** also added many artistic features to this temple during his reign.
- The **kalyan mandapam** of the temple, especially showcase **Nayaka art**.

[Raja Ravi Verma](#)

The first true copy of the painting Indulekha by Raja Ravi Varma will be unveiled at the Kilimanoor Palace, Kerala.

About Raja Ravi Varma -

- He was an **Indian painter** and artist. He is considered one of the greatest painters in the history of Indian art.
- He was born as Ravi Varma Koil Thampuran of Kilimanoor palace, in the erstwhile **princely state of Travancore** (Thiruvithankur) in Kerala.
- He is known for his amazing paintings, which revolve mainly around the Puranas (ancient mythological stories) and the great Indian epics, the Mahabharata and Ramayana.
 - In addition to incidents in Hindu mythology, Varma painted many portraits of both Indians and British in India.
- His most **famous works** include Damayanti Talking to a Swan, Shakuntala Looking for Dushyanta, Nair Lady Adorning Her Hair and Shantanu and Matsyagandha.
- Features of his work —
 - Before Raja Ravi Varma's paintings, the paintings of Indian artists were greatly influenced by the Persian and Mughal schools.
 - Varma was the **first Indian to use Western techniques** of perspective and composition and to adapt them to Indian subjects, styles and themes.
 - His works are one of the best examples of the **fusion of European academic art with a purely Indian sensibility and iconography**.
 - He was one of the **first Indian artists to use oil paints** and to master the art of **lithographic reproduction** of his work.
 - He was notable for making affordable lithographs of his paintings available to the public, which greatly enhanced his reach and influence as a painter and public figure.
 - His paintings often **depicted mythological characters and Indian royalty** in a realistic style, challenging traditional artistic norms.
- Recognitions —
 - He received widespread acclaim after he won an award for an exhibition of his paintings at Vienna in 1873.
 - His paintings were also sent to the **World's Columbian Exposition** held in **Chicago in 1893** and he was awarded two gold medals.
 - **In 1904**, Viceroy Lord Curzon, on behalf of the King Emperor, bestowed upon Raja Ravi Varma the **Kaisar-i-Hind Gold Medal**. At this time, his name was mentioned as "Raja Ravi Varma" for the first time.

SECURITY

Missile assisted-torpedo release system

Defence Research and Development Organisation (DRDO) has successfully tested a long-range Supersonic Missile Assisted Torpedo (SMART). It is aimed at boosting the Navy's anti-submarine warfare capabilities.

Supersonic Missile Assisted Torpedoes (SMART) -

- **Background: Torpedo —**
 - Torpedoes, self-propelled weapons that travel underwater to hit a target, are limited by their range.
 - In the mid-2010s, DRDO undertook a project to build capacity to launch torpedoes assisted by missiles.
- **About SMART —**
 - SMART system comprises a mechanism by which the torpedo is launched from a supersonic missile system with modifications.
 - These modifications would take the torpedo to a far longer range than its own.
 - For example, a torpedo with a range of a few kilometres can be sent a distance to the tune of 1000 km by the missile system from where the torpedo is launched.
- **Institutions involved —**
 - A number of DRDO laboratories have developed the technologies required for SMART. These include:
 - Defence Research and Development Laboratory (DRDL) and Research Centre Imarat (RCI), both in Hyderabad;
 - Aerial Delivery Research and Development Establishment (ADRDE) in Agra; and
 - Naval Science and Technology Laboratory (NSTL) Visakhapatnam.
- **Features —**
 - The system can be launched from both coasts and warships.
 - The **canister-based missile system** comprises several advanced subsystems including two-stage solid propulsion and precision inertial navigation.
 - Canister enables smooth and safe launch of article. Also, canister serves the purpose of transportation, storage and launching of missiles.
 - These Canisters are filled with inert gases to provide protection from outside environment during Storage and transportation.
 - It carries an advanced lightweight torpedo missile as a payload along with a parachute-based release mechanism.
- **Significance —**
 - This missile-based mechanism to launch lightweight torpedoes can target submarines hundreds of kilometres away – far beyond the conventional range of lightweight torpedoes.
 - It will be particularly employed in the absence of other assets for immediate action when an enemy submarine is detected.

Seizing of drugs

The Indian Coast Guard (ICG) seized 86 kg of suspected heroin worth Rs 602 crore from a Pakistani boat, which was on its way to Sri Lanka via Tamil Nadu.

The drugs were seized off the Porbandar coast in Gujarat during a joint ICG operation with the Anti-Terrorist Squad (ATS) and the Narcotics Control Bureau (NCB).

The action was undertaken as part of Operation Sagarmathan series that aims to make India drug-free.

Importance of maritime security -

- **Maritime security of vast coastlines —**
 - India has along 7,516-km coastline, including island territories, and a 2 million sq km Exclusive Economic Zone.
 - The importance of maritime security was evident following the 26/11 Mumbai terror attack.
- **Economic and energy security —**
 - 95% of India's trade by volume and 70% by value transit through the seas.

- Strengthening the country's maritime security is also necessary as India is focusing on becoming a blue economy.
- The Indian government is set to clear the Deep Ocean Mission for the blue water economy.
- **Geostrategic Need —**

- China is penetrating into the Indian Ocean through Pakistan and Myanmar.
- Enhanced maritime security will give a boost to India's SAGAR (Security and Growth of All in the Region) doctrine.
 - Under this doctrine, India has envisioned a role of net security provider for itself in the IOR.

Mechanisms to ensure maritime security -

- Coastal border management was institutionalised in 2004 with the establishment of the Department of Border Management in the MHA.
- However, after the '26/11' attacks, coastal and maritime security underwent a paradigm shift. These included –
 - A **three-tier security grid** the Indian Navy, the coast guard, and the marine police;
 - **Increased electronic surveillance** using Coastal radar chain, Automatic identification system (AIS), Vessel traffic management and information system
 - Establishment the National Command Control Communication and Intelligence (NC3I) Network;
 - **Sagar Prahari Bal** for protecting of naval bases has been raised by Navy;
 - Establishment of **Information Fusion Centre – Indian Ocean Region (IFC-IOR)**.

Associated Issues in maintaining maritime security -

- There are no formal or commonly accepted definitions of concepts like 'maritime security', 'coastal security' and 'coastal defence'. Sometimes, it leads to vagueness.
- Multiple institutions are involved and there is lack of coordination.
- **Turf war** between MHA and Ministry of Defence (MoD). Demands are being made to bring Coast Guard under the control of
- Fishermen are considered as the eyes and ears for coastal security. However, discontent among fishermen community, involvement of politics in fishermen issues etc. are further complicating the security architecture.
- Inadequate infrastructure, acute shortage of manpower is posing challenges in providing maritime security in India.

Indian Coast Guard (ICG) -

- **About —**
 - The ICG is a maritime armed force and search and rescue agency that protects India's maritime and national interests.
 - It was established in February 1977 by the Coast Guard Act of the Parliament of India and operates under the Ministry of Defence.
- **ICG's missions include —**
 - Protecting artificial islands, offshore terminals, and other installations
 - Protecting and assisting fishermen and mariners at sea
 - Marine Pollution control

ATACMS

The United States recently confirmed providing long-range Army Tactical Missile Systems (ATACMS) to Ukraine to aid its war effort against Russia.

About Army Tactical Missile Systems (ATACMS) -

- It is a conventional **surface-to-surface artillery weapon** system capable of striking targets well beyond the range of existing Army cannons, rockets and other missiles.
- It is manufactured by the **US defence company Lockheed Martin**.
- It is also **designated M39** by the US Army, and its Department of Defence (DoD) designation is **MGM-140**. It first saw use during the 1991 Persian Gulf War.
- It's known operators other than the US are Bahrain, Greece, South Korea, Taiwan, and the United Arab Emirates.
- **Features —**
 - It is 24/7, all-weather, surface-to-surface, inertially **guided ballistic missile**.
 - It is single-stage, solid propellant with a range of about 190 miles (305 km).

- They are fired from the **High Mobility Artillery Rocket System (HIMARS)** and the **M270 Multiple Launch Rocket System (MLRS)** The MLRS can fire 12 surface-to-surface missiles in less than a minute.
- It has the ability to **carry cluster munitions**, which destroy a targeted area by releasing hundreds of bomblets instead of a single warhead.

[INS Vikrant](#)

Recently, both aircraft carriers of the Indian Navy, INS Vikramaditya and INS Vikrant, showcased “twin carrier operations” with MiG-29K fighter jets taking off simultaneously from both and landing cross deck.

About INS Vikrant -

- It is the first ever **indigenously designed and constructed aircraft carrier** which will strengthen the country’s stand as a ‘Blue Water Navy’.
- It has been designed in-house by Indian Navy’s **Warship Design Bureau** and constructed by M/s Cochin Shipyard Limited.
- India also joined the elite group of nations - the US, Russia, France, the UK and China - who are capable of designing and constructing aircraft carriers.
- Also, with a displacement of 43,000 tonnes when fully loaded, INS Vikrant is set to be the seventh largest among the carriers or carrier classes in the world.
- What are its capabilities?
 - It can operate an air wing of 30 aircraft comprising **MiG-29K fighter jets**, Kamov-31, MH-60R multi-role helicopters, in addition to indigenous Advanced Light Helicopters and Light Combat Aircraft (Navy).
 - It uses the **STOBAR (Short Take-Off but Arrested Recovery) method** to launch and recover aircraft for which it is equipped with a ski- jump to launch aircraft and three ‘arrestor wires’ for their recovery.

[Hangor Class Submarine](#)

Pakistan recently launched the Hangor class submarine (built by China) at a Wuhan shipyard. This was the first of eight submarines that the Pakistan Navy is set to induct into its fleet by 2028.

Basic Characteristics -

The Hangor-class, an export variant of the Chinese Type 039A Yuan class, is a diesel-electric attack submarine named after PNS Hangor (now decommissioned), which famously sank Indian frigate INS Khukri during 1971 war. It boasts four diesel engines, is equipped with an Air Independent Propulsion (AIP) system to increase its endurance underwater, has six 21-inch torpedo tubes, and is capable to launch anti-ship missiles, as well as the Babur-3 subsonic cruise missile (with 450km range).

Comparison with India’s Kalavari Class -

- Hangor class is significantly bigger in size than the Kalavari class which is based on French Scorpene-class, but small size makes Kalavari class much more maneuverable.
- Both the submarines have same top speed of 20 knots (37 kmph).
- Kalavari class doesn’t come with built-in AIP as the Hangor. This matters because submarines’ USP is their ability to be stealthy, which comes from their capability of remaining underwater for extended time period. An AIP system can increase submarines’ underwater endurance manifold (upwards of 15-20 days).
- In terms of armament, Kalavari class carries six 21 inch, German-made torpedoes, and missile systems like French Exocet anti-ship missiles, and MICA anti-air missiles. This is likely superior, and more battle tested than Hangor’s armament.
- Both submarines don’t have vertical launch systems (like the ones in India’s nuclear Arihant class), which would allow it to carry bigger cruise missiles.
- Both submarine classes carry state of art sensor suites, although details of Hangor’s capabilities are not known yet.

Sierra Madre

Sierra Madre, an old Philippine ship is fueling China-Philippine tensions.

What is Sierra Madre?

It is a 100ft-long landing ship commissioned by the US in 1944 during World War II. US used it in Vietnam War (1954-75) and then transferred it to Philippines in 1976. Philippines left the ship on Second Thomas Shoal (part of Spratly islands) to halt further Chinese assertions in the area as China laid claims on nearby Mischief reefs. China is continuously demanding the removal of this largely dilapidated and rusting ship. But, for Philippines, ship's removal would weaken its claims over the islands and strengthen Chinese presence.

What is the battle over Spratly islands?

For decades, regional countries have extended overlapping claims over the South China Sea, its islands like Spratly and Paracel, its rich oil and gas reserves and fishing waters. Disputes over Spratly islands gradually escalated under former Philippine President Benigno Aquino III and culminated in 2012 when China took effective control of disputed Scarborough Shoal after a tense standoff. In this case, an international tribunal in The Hague ruled in favour of Philippines and ruled that "areas not overlapped by any possible entitlement of China, are within Exclusive Economic Zone of Philippines". China rejected this ruling.

Response of U.S. -

The U.S., which regards Philippines as an important strategic ally, has supported Philippines. In May 2023, the two countries agreed on new guidelines to a 1951 U.S.-Philippines Mutual Defence Treaty which reaffirm that "an armed attack in the Pacific, including anywhere in the South China Sea, on either of their public vessels, aircraft, or armed forces (including Coast Guards) would invoke mutual defence commitments". US also supported Manila when it summoned China's Deputy Chief of Mission for Chinese navy's "aggressive actions" against a resupply mission.