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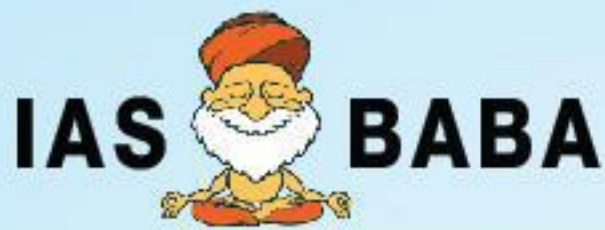
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PRELIMS



POLITY & GOVERNANCE



CITIZENSHIP LAWS

Context: In the gale of executive orders announced after Trump assumed office for a second term, the President issued one diluting birthright citizenship, which has been written into the U.S. Constitution since 1866. The order has been challenged in court in more than 20 States and a federal judge has temporarily blocked it.

Background: -

- If implemented, it will mean that children born to illegal immigrants — as well as those legally in the U.S. on temporary visas for study, work or tourism purposes — will not be eligible for automatic U.S. citizenship. At least one parent must now be a U.S. citizen or legal permanent resident, the order says.

Key takeaways

- The 14th amendment to the U.S. Constitution, which granted citizenship to “all persons born or naturalized in the United States, and subject to the jurisdiction thereof” was enacted in 1866, against the backdrop of the Civil War which had just ended.
- Trump’s supporters rail against the practice of birth tourism, or anchor babies, where foreign nationals seek to give birth in the U.S., in the hope that those babies will be able to help their families migrate to the country as well.

How do citizenship laws vary?

- The U.S. follows the principle of jus soli (the right of soil), based on geography regardless of parental citizenship, as opposed to jus sanguinis (the right of blood), which gives citizenship based on the nationality of the child’s parents.
- There are only 37 countries which currently enforce the jus soli principle, of which 29 are in the Americas. Of the other eight, two are in India’s neighbourhood: **Nepal and Pakistan, though the latter introduced a Bill seeking to end this.**
- Jus soli historically allowed colonisers to quickly outnumber native populations as citizens. Countries that have traditionally built their national character through diverse immigrant populations have used jus soli as a way of integrating diversity into the common stream of nationhood.
- Countries protective of their culture and identity have generally followed the principle of jus sanguinis.
- Jus soli derives from English common law and, until anti-migrant backlash a few decades ago, was implemented in the U.K. and most of its former colonies, including India.
- India offered automatic citizenship to all those born on Indian soil before 1987. Introducing the Citizenship Bill in Parliament in 1955, then-Home Minister Govind Ballabh Pant said, “The mere

fact of birth in India invests with it the right of citizenship in India. We have taken a cosmopolitan view and it is in accordance with the spirit of the times, with the temper and atmosphere which we wish to promote in the civilised world.”

- Three decades later, sentiments changed, in the wake of unrest in Assam due to migration from Bangladesh as well as the refugees from Sri Lanka, following the civil war there. “The time has come to tighten up our citizenship laws. We cannot be generous at the cost of our own people, at the cost of our own development,” said P. Chidambaram, Union Minister of State for Home Affairs, while introducing the Citizenship (Amendment) Bill in the Lok Sabha in 1986.

Source: [The Hindu](#)

ARTICLE 200

Context: The Supreme Court questioned Tamil Nadu Governor R N Ravi’s decision to withhold assent to some Bills presented to him by state legislature and said “he seems to have adopted his own procedure”.

Background:

- On November 13, 2023, the Governor R.N. Ravi had declared that he was withholding assent on 10 bills passed by the Tamil Nadu state assembly. Subsequently, the assembly convened a special session on November 18, 2023, and re-enacted the same bills.
- This time, the governor had to proceed to refer all 10 bills to the President for consideration; the President had assented to one Bill, rejected seven and did not consider two proposed laws. The state government argued that the governor’s conduct was that of a political opponent.

Key takeaways

- While Article 163 of the Constitution deals with the powers of the Governor generally, Article 200 specifically deals with the issue of granting assent to Bills. Both the provisions are read together to determine the contours of the power the Governor holds on this issue.
- When a Bill passed by the legislature of a state is presented to the Governor, the Governor has four options: **(1) grant assent to the Bill;** **(2) withhold assent to the Bills;** **(3) return the Bills for reconsideration;** or **(4) reserve the Bill for the consideration of the President.**
- Article 200 reads: When a Bill has been passed by the Legislative Assembly of a State or, in the case of a State having a Legislative Council, has been passed by both Houses of the Legislature of the State, it shall be presented to the Governor and the Governor shall declare either that he assents to the Bill or that he withholds assent therefrom or that he reserves the Bill for the consideration of the President.
- However, the Article has a key provision. It says that the Governor “may, as soon as possible” return Bills other than money Bills, with a message requesting that the House reconsider it in parts or in whole. However, once the Legislative House reconsiders the Bill and sends it to the Governor once again, the Governor “shall not withhold assent therefrom”.
- An indefinite timeline in deciding on Bills can paralyse the elected government. At the same time, giving assent to Bills is one of the few areas in which the Governor can exercise his discretion. But again, this discretion cannot be used arbitrarily or based on a personal preference, but only in Constitutional terms with cogent reasons.

- Additionally, Article 200 uses the word “shall” which indicates that the framers of the Constitution intended a mandatory tone for the Governor on this aspect. The Supreme Court in its landmark 2016 ruling in the Arunachal Pradesh Assembly case (Nabam Rebia and Bamang Felix vs Deputy Speaker) discussed this aspect briefly.

Source: [Indian Express](#)

STATES SEEK 50% SHARE IN CENTRAL TAXES

Context: Odisha demanded an increase in states’ share of central taxes to 50 per cent from the existing 41 per cent. Odisha, which has sought Rs 12.59 lakh crore in central taxes for the period 2026-31, joins states such as Gujarat and Tamil Nadu in making the demand.

Background: -

- CM Mohan Charan Majhi, along with senior officers, met the finance commission headed by Arvind Panagariya to seek an increase in its share in central taxes. It also demanded inclusion of cess and surcharge in divisible pool so states can have their share in it.

Key takeaways

- **The Finance Commission (FC)** is a constitutional body set up under Article 280 of the Constitution to make recommendations on the distribution of resources between the Union and the states.
- **The First FC was constituted in 1951** and its recommendations covered the five-year period 1952-57. Since then, we have had 15 FCs.
- **Currently the 16th Finance Commission** is in office which was constituted in December 2023. The Commission is required to submit its report by October 31, 2025 and would make recommendations for the five-year period starting April 1, 2026.
- The FC addresses the vertical imbalance arising out of asymmetric assignment of revenues and expenditure between the Union and the states in the Constitution by recommending sharing a proportion of all taxes collected by the Union government with the states (also called devolution).
- **The 13th FC recommended** sharing 32% of the divisible pool of resources with the states. The 14th FC increased this proportion to 42% while the 15th FC recommended sharing 41% with the states.
- A number of criteria (with weights) is used for distribution of the shareable tax revenue among states. These are classified under four heads: need (population, area, demographic change), equity (income distance), efficiency/ performance (tax-effort, fiscal discipline, demographic performance), and fiscal disability (forest cover).
- The 15th FC used 2011 population (with 15% weight), area (15%), forest and ecology (10%), income distance (45%), tax and fiscal efforts (2.5%) and demographic performance (12.5%) for determining inter se shares of states. FCs also recommend grants to states. However, devolution is the dominant component, accounting for 80-85% of total FC transfers.

Source: [Indian Express](#)

ARTICLE 371

Context:A regional party in poll-bound Meghalaya has indicated that bringing the State under the purview of Article 371 could help resume rat-hole coal mining, which has been banned since April 2014.

Background:

- Voice of the People Party (VPP) cited the example of Nagaland to seek Article 371 for Meghalaya.

Key takeaways

- Special provisions provided to some States are listed in Articles 371 (A-J) in Part XXI of the Constitution, which deals with “temporary, transitional and special powers for certain States.” While Articles 370 (now abrogated) and 371 have been a part of the Constitution since 1950, Articles 371 (A-J) were incorporated in subsequent years through amendments.
- **Article 371** of the Indian Constitution grants special provisions to Maharashtra and Gujarat.
- **Article 371A was made in 1962** after a deal was struck between the Centre and the Naga People’s Convention creating the State of Nagaland. Under the provision, no Act of Parliament about the religious or social practices of the Nagas, their customary law and procedure, including civil and criminal justice matters, and ownership or transfer of land and resources will apply to Nagaland, unless the State’s Legislative Assembly passes a resolution to do so. Further, non-residents can’t buy land in Nagaland.
- **Article 371B deals with Assam.**
- **Article 371C applies to Manipur and was inserted into the Constitution in 1972.**
- **Articles 371D and E include special provisions for Andhra Pradesh.**
- **Article 371F** takes into account the unique status of Sikkim after its merger with India in 1975 and grants protection to existing laws. Only descendants of Sikkim subjects (those who lived in the State before its merger with India) whose names were mentioned in the 1961 register have the right to own land and get State government jobs in Sikkim.
- **Article 371G** applies to Mizoram. It includes special provisions to preserve the religious and social practices, customary law, and procedure of Mizos in Mizoram, as well as for the administration of criminal and civil justice, besides ownership and transfer of land.
- **Article 371H** confers a special responsibility on the Governor of Arunachal Pradesh concerning law and order.
- **Article 371I** relates to Goa. It requires the Legislative Assembly of Goa to consist of not less than 30 members.
- **Article 371J** accords special status to the Hyderabad-Karnataka Region (Kalyana Karnataka).

Source: [The Hindu](#)

AUTONOMOUS DISTRICT COUNCILS

Context:The Khasi Hills Autonomous District Council (KHADC) and the Jaintia Hills Autonomous District Council (JHADC) elections will be held on February 21, 2025.

Background: -

- The KHADC and JHADC cover areas dominated by matrilineal communities — the Khasi and Jaintias respectively — but less than 7% of the candidates contesting the elections to these councils are women.

Key takeaways

- Autonomous District Councils (ADCs) in India are administrative bodies established to provide self-governance and preserve the cultural identities of tribal communities, primarily in the northeastern states.

Key Features of Autonomous District Councils:

- **Constitutional Basis:** The Sixth Schedule of the Indian Constitution provides for the creation of ADCs in the states of Assam, Meghalaya, Tripura, and Mizoram. This schedule aims to protect the rights of tribal populations through self-governance.
- **Legislative Powers:** ADCs have the authority to legislate on subjects such as land management, forest resources, water resources, agriculture, village administration, public health, and social customs. These laws are applicable within their respective jurisdictions.
- **Judicial Powers:** ADCs can establish courts to adjudicate cases involving members of Scheduled Tribes, provided the offenses are minor and the sentences do not exceed five years of imprisonment. These courts function parallel to the regular judicial system.
- **Financial Powers:** ADCs are empowered to levy and collect taxes, fees, and tolls on various subjects, including land, buildings, animals, vehicles, and professions. They can also receive grants from the state government for specified projects.
- **As of now, there are 10 ADCs constituted under the Sixth Schedule:**
 - **Assam:** Bodoland Territorial Council, North Cachar Hills Autonomous Council, Karbi Anglong Autonomous Council
 - **Meghalaya:** Garo Hills Autonomous District Council, Jaintia Hills Autonomous District Council, Khasi Hills Autonomous District Council
 - **Mizoram:** Chakma Autonomous District Council, Lai Autonomous District Council, Mara Autonomous District Council
 - **Tripura:** Tripura Tribal Areas Autonomous District Council
- Additionally, several states have established autonomous councils through state legislation to cater to the specific needs of tribal communities. For instance, in Assam, there are councils like the Rabha Hasong Autonomous Council, Mising Autonomous Council, and Tiwa Autonomous Council, among others.

Source: [The Hindu](#)

IMMIGRATION AND FOREIGNERS BILL, 2025

Context: The Immigration and Foreigners Bill, 2025, is likely to be introduced by Union Home Minister Amit Shah in the ongoing Budget session of Parliament.

Background: -

- The proposed legislation will replace the existing laws — the Passport (Entry into India) Act, 1920; the Registration of Foreigners Act, 1939; the Foreigners Act, 1946; and the Immigration

(Carriers' Liability) Act, 2000.

- The acts, namely the Passport (Entry into India) Act, 1920, the Registration of Foreigners Act, 1939, and the Foreigners Act, 1946, are not only of the pre-Constitution period but also, they were brought into extraordinary times of first and second world wars. While there is an underlying continuity and commonality of objectives among the four Acts, there are some overlapping provisions among the said laws.

Key takeaways

- The Bill will specify the matters relating to foreigners and their registration, the provisions relating to the obligation of universities and educational institutions admitting any foreigner, the obligation of hospitals, nursing homes or any other medical institution admitting foreigners.
- The bill specifies the role of “every person occupying or having under his control any residential premises” to submit to the registration officer information in respect to any foreigners accommodated in such premises.
- It mandates every university and educational institution admitting any foreigner to furnish information to the registration officer.
- Similarly, it specifies the role of “**every hospital, nursing home or any other such medical institution providing medical, lodging or sleeping facility in their premises**” to inform the authority (registration officer) about “**any foreigner taking indoor medical treatment or their attendant for whom such lodging or sleeping facility has been provided**”.
- The Bill obligates the carriers such as airlines and vessels to remove a passenger denied entry by the immigration officer and provide passenger and crew data to the authorities in advance. The bill carries a provision of up to ₹5 lakh in fine for violating carriers.

Source: [Indian Express](#)

PRESIDENT'S RULE AMONG OPTIONS FOR MANIPUR

Context: A significant temperature drop has been observed across North India due to a western disturbance currently positioned over North Pakistan, the India Meteorological Department (IMD) reported.

Background: -

- After N Biren Singh resigned as Manipur's Chief Minister, the BJP leadership is exploring its options. If the party fails to find a consensus CM candidate, the state may have to be put under President's rule.

Key takeaways

- The imposition of President's Rule under Article 356 effectively transfers all the functions of the state government to the Centre and the function of the state legislature to Parliament during the period when it is in force.
- The process begins if the President, on receiving a report from the Governor, is “satisfied that a situation has arisen in which the Government of the State cannot be carried on in accordance with the provisions of this Constitution”.
- President will issue a ‘**Proclamation**’, which can remain in force for up to two months. The Lok Sabha and the Rajya Sabha must approve it through a resolution before this period expires for it

to remain operative further. If approved, the proclamation of President's Rule can be extended to six months and Parliament can approve further six-month extensions for up to three years.

- Certain conditions must be met before a proclamation can be renewed by Parliament beyond a year since it was first issued. Further extensions can only be approved if an Emergency has been declared in the country or that particular state, or if the Election Commission certifies that President's Rule is necessary due to difficulties in conducting state elections.
- Since 1950, when the Constitution first came into force, President's Rule has been imposed a total of 134 times across 29 states and UTs.
- It has been imposed most frequently in Manipur and Uttar Pradesh, at 10 times each. However, these are not the states (including UTs) that have spent the most time under central control. That distinction is held by Jammu & Kashmir, followed by Punjab and Puducherry.
- Since 1950, Jammu and Kashmir has spent over 12 years (4,668 days) under President's Rule and Punjab has been under Central control for over 10 years (3,878 days) in the same period. In both states, this is largely owed to recurring spells of militant and separatist activity, and unstable law and order situations.

Source: [Indian Express](#)

CHOOSING NEXT CHIEF ELECTION COMMISSIONER

Context: With Chief Election Commissioner Rajiv Kumar set to retire on February 18, a three-member selection committee headed by Prime Minister is set to meet on February 17 to pick his successor.

Background: -

- This is the first time that a CEC will be selected under the provisions of the new law — the Chief Election Commissioner and other Election Commissioners (Appointment, Conditions of Service and Term of Office) Act, 2023. Before this, Election Commissioners Gyanesh Kumar and Sukhbir Singh Sandhu had been selected under the new law.

Key takeaways

- Earlier, Election Commissioners and the Chief Election Commissioner were appointed by the President based on the recommendations of the government.
- The law came into effect after the Supreme Court, in its ruling in March 2023, mandated a selection panel be formed and said that it should comprise the Prime Minister, the Leader of the Opposition in the Lok Sabha, and the Chief Justice of India. The court said the order would hold good until a law was made by Parliament.
- However, when the law was passed, the Centre replaced the CJI with a Union Minister as the third member, giving the government a dominant role in the appointment process. On February 17, the panel will select a name from a list of five prepared by a search committee.
- The Act says, "A Search Committee headed by the Minister of Law and Justice and comprising two other members not below the rank of Secretary to the Government of India, shall prepare a panel of five persons for consideration of the Selection Committee, for appointment as the Chief Election Commissioner and other Election Commissioners".
- After Mr. Rajiv Kumar, Mr. Gyanesh Kumar is the senior-most Election Commissioner. The

committee is also likely to select an Election Commissioner in case current Mr. Gyanesh Kumar is elevated to the top post.

- According to the law, the CEC and other ECs will be appointed from among persons who are holding or have held a post equivalent to the rank of secretary to the government of India and will be persons of integrity with knowledge of and experience in management and conduct of elections.

Source: [The Hindu](#)

ADVOCATE-ON-RECORD

Context: The Supreme Court has held that Advocates-on-Record (AoRs) bear full responsibility for the accuracy of petitions filed before the Court, even if the drafts are prepared by other advocates.

Background: -

- The Court warned against AoRs merely lending their names to petitions without due diligence.

Key takeaways

- The Supreme Court of India has a unique designation known as Advocate-on-Record (AOR), which grants exclusive rights to file cases before the apex court.
- An Advocate-on-Record is a lawyer who is authorized to file pleadings and appear before the Supreme Court of India on behalf of clients.
- Only an AoR can file cases before the Supreme Court. An AoR might engage other lawyers including senior counsels to argue before the Court.
- **Eligibility Criteria to Become an AOR:**
 - The advocate must have four years of legal practice.
 - They must complete one year of training under a Supreme Court approved AOR.
 - They must pass the AOR Examination, conducted by the Supreme Court, which includes subjects like Constitutional Law, Practice & Procedure, and Professional Ethics.
 - They must maintain an office within a 16-km radius of the Supreme Court and have a registered clerk.
- **Key Responsibilities of an AOR:**
 - Filing and processing cases in the Supreme Court.
 - Ensuring compliance with Supreme Court rules and procedures.
 - Managing legal documentation and submissions before the apex court.
 - Representing clients in Supreme Court cases.
- **Significance of the AOR System:**
 - Ensures high-quality legal representation at the Supreme Court.
 - Helps in streamlining case management and adherence to procedural rules.
 - Facilitates better coordination between the judiciary and legal practitioners.

Source: [Live Law](#)

ARTICLE 101(4)

Context: Incarcerated Khadoor Sahib MP Amritpal Singh moved the Punjab and Haryana High Court to attend the ongoing Parliament session, lest he lose his seat because of his prolonged absence from the House.

Background: -

- Amritpal, who faces charges under National Security Act, has been detained in Dibrugarh since April 2023. He contested and won the 2024 Lok Sabha election from prison, but thus far has an attendance of only 2%.

Key takeaways

- “If for a period of sixty days a member of either House of Parliament is without permission of the House absent from all meetings thereof, the House may declare his seat vacant,” Article 101(4) says.
- The 60 days, however, do not account for “any period during which the House is prorogued or is adjourned for more than four consecutive days”.
- Effectively, the period of absence is only calculated based on the actual sittings of Parliament. Amritpal, for instance, only attended one sitting of the Lok Sabha — the one in which he was sworn in last July. Since then, he has remained in detention in Assam.

MPs can seek leave

- **The operative term in Article 101(4) is “without permission of the House”.** For long absences, MPs write to the ‘Committee on Absence of Members from the Sittings of the House’, the parliamentary panel that deals with this issue.
- The committee makes recommendations on each leave application, which are then ratified by the House concerned. In practice, however, applications are seldom rejected.
- **Past leave application reports list illness** — their own or some relative’s — as the most common reason for MPs being granted leave. That said, members have requested and been granted leave on the count of being imprisoned as well.
- In 2023, then Ghosi MP Atul Rai of the Bahujan Samaj Party sought permission to remain absent on 23 consecutive sittings of Parliament as he was in jail. His application was granted.
- Even if an MP is absent for more than 60 days, the House has to “declare” the seat vacant, meaning the matter has to be put to vote.

Source: [Indian Express](#)

ZONAL COUNCILS

Context: Union Home Minister Amit Shah chaired the 27th meeting of the Western Zonal Council in Pune.

Background: -

- The idea of creation of Zonal Councils was mooted by the first PM Jawaharlal Nehru in 1956 when during the course of debate on the report of the States Reorganisation Commission, he suggested that the states proposed to be reorganised may be grouped into four or five zones having an

Advisory Council “to develop the habit of cooperative working”.

Key takeaways

- Zonal Councils in India are statutory bodies created under the States Reorganisation Act, 1956. The North-Eastern Council (NEC), created under a separate Act in 1971, covers the northeastern states and functions differently.
- **The present composition of the Zonal Councils is as follows:**
 - The Northern Zonal Council, comprising the States of Haryana, Himachal Pradesh, Jammu & Kashmir, Punjab, Rajasthan, National Capital Territory of Delhi and Union Territory of Chandigarh.
 - The Central Zonal Council, comprising the States of Chhattisgarh, Uttarakhand, Uttar Pradesh and Madhya Pradesh.
 - The Eastern Zonal Council, comprising the States of Bihar, Jharkhand, Orissa, and West Bengal.
 - The Western Zonal Council, comprising the States of Goa, Gujarat, Maharashtra and the Union Territories of Daman & Diu and Dadra & Nagar Haveli.
 - The Southern Zonal Council, comprising the States of Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and the Union Territory of Puducherry.
 - North Eastern Council was set up under the North Eastern Council Act, 1972 with Assam, Arunachal Pradesh, Manipur, Tripura, Mizoram, Meghalaya and Nagaland as its members. The state of Sikkim, earlier in the Eastern Zonal Council was included in the North Eastern Council in 2002.
- **Each Zonal Council has a Standing Committee consisting of Chief Secretaries of the member states.** These Standing Committees meet from time to time to resolve the issues or to do necessary groundwork for further meetings of the Zonal Councils.
- The composition of each council is as follows: The Union Home Minister is the chairman of each of these councils. The Chief Ministers of the states included in each zone act as Vice-Chairman of the Zonal Council for that zone by rotation, each holding office for a period of one year at a time.
- In 2018, the Union Cabinet chaired by the Prime Minister Narendra Modi approved the nomination of the Union Home Minister as ex-officio chairman of North Eastern Council and the **Minister Development of North Eastern Region (DoNER)** to serve as Vice Chairman of the Council.

Source: [Indian Express](#)

DELIMITATION

Context: Home Minister Amit Shah asserted that delimitation will not lose any Parliamentary seat to the Southern states. The statement came after Tamil Nadu Chief Minister M K Stalin Tuesday announced an all-party meeting to discuss the issue of delimitation.

Background: -

- In Independent India's history, delimitation has taken place four times – 1952, 1963, 1973, and 2002.

Key takeaways

- The Election Commission defines delimitation as the process of drawing constituency boundaries for elected bodies based on the population in the most recent Census.
- **Article 82 of the Constitution states** that after every Census is completed, the allocation of Lok Sabha seats to each state must be adjusted based on population changes.
- **Article 81 states** there can be no more than 550 members in the Lok Sabha – 530 from states and 20 from Union Territories. It also says that “the ratio between (the number of seats) and the population of the state is, so far as practicable, the same for all states”. So, each constituency across the country should ideally have the same population.
- **The Constitution has provided for an independent Delimitation Commission** to reapportion seats among states. The Commission is appointed by the President of India and comprises a retired judge of the Supreme Court or a high court, the Chief Election Commissioner, and the State Election Commissioner.
- **Once published, the Commission’s orders are final and, as per the Delimitation Commission Act 1952 and Article 329A of the Constitution, has the “full force of law and shall not be called into question in any court”.**
- The required amendment in the Constitution for the implementation of delimitation process includes changes to Article 81 (which defines the composition of the Lok Sabha), Article 170 (composition of Legislative Assemblies), Article 82, Article 55 (deals with the presidential election process for which value of each vote in the electoral college is decided on the population basis), Articles 330 and 332 (covering reservation of seats for the Lok Sabha and Legislative Assemblies, respectively).

Changes in the composition of Lok Sabha as a result of delimitation

- **Delimitation has taken place four times** – 1952, 1963, 1973 and 2002, with the number of seats fixed and readjusted during the first three exercises.
- **The number of seats in the Lok Sabha based on the 1951, 1961 and 1971 Census was fixed at 494, 522 and 543**, when the population was 36.1, 43.9 and 54.8 crore respectively. This broadly translated to an average population of 7.3, 8.4 and 10.1 lakh per seat respectively.
- In 1976, the 42nd Amendment to the Constitution froze the number of Lok Sabha seats and put off delimitation for 25 years until the 2001 Census under Article 82.
- **The Indira Gandhi-led government** said it did not want to punish states with effective population control measures, as their representation in the Lok Sabha would fall compared to states with high populations.
- In 2002, another amendment was made under the Vajpayee-led government. This 84th Amendment further delayed delimitation for another 25 years. Though constituency boundaries were redrawn to account for changes in population according to the 2001 Census, the total number of Lok Sabha seats and the number of seats allotted to each state remained unchanged.

Source: [Indian Express](#)



INTERNATIONAL RELATIONS



INTERNATIONAL BIG CAT ALLIANCE (IBCA)

Context: The International Big Cat Alliance (IBCA) has officially come into force as a treaty-based, inter-governmental organisation, becoming a fully functional international legal entity.

Background: -

- The Ministry of External Affairs (MEA), acting as the Depository for the Framework Agreement, confirmed that five countries – Nicaragua, Eswatini, India, Somalia, and Liberia – have deposited their instruments of ratification, acceptance, or approval, making them the founding members of the IBCA.

Key takeaways

- **The IBCA was launched by Prime Minister Narendra Modi on April 9, 2023**, during an event commemorating the 50th anniversary of Project Tiger.
- The initiative's main objective is the conservation of seven major big cat species: the Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, and Puma.
- **Members:** As of now, 27 countries have consented to join, including India, Nicaragua, Eswatini, Somalia, and Liberia.
- The membership of the IBCA is open to all UN member countries, especially those that host these species, and to non-range countries that are interested in supporting big cat conservation efforts.
- The IBCA has a framework agreement, and its headquarters is in India. It includes an Assembly of Members, a Standing Committee, and a Secretariat.

INDIA-MIDDLE EAST-EUROPE ECONOMIC CORRIDOR (IMEC)

Context: Greek Foreign Minister George Gerapetritis has affirmed Greece's full support for the India-Middle East-Europe Economic Corridor (IMEC), describing it as a project for peace.

Background: -

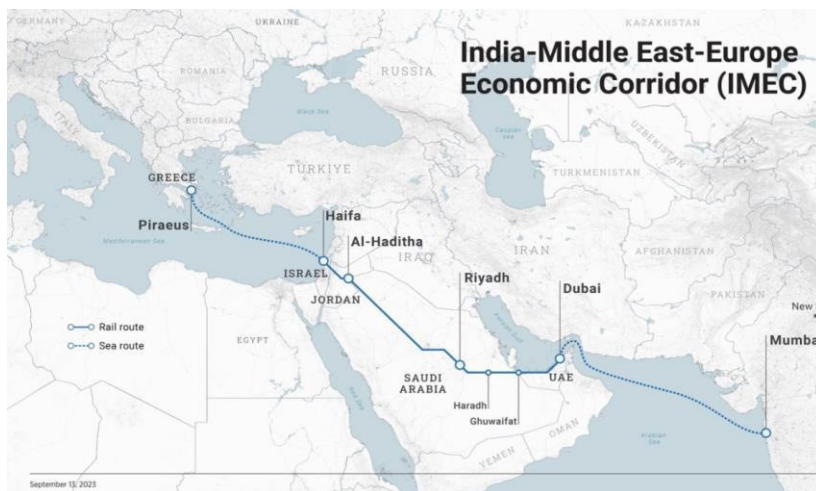
- Minister acknowledged that the initiative, launched in September 2023, has faced delays due to conflicts in West Asia, particularly the Israel-Gaza war.

Key takeaways

- **The India–Middle East–Europe Economic Corridor (IMEC)** aims at boosting economic development and enhancing inter-regional connectivity between Asia, the Persian Gulf, and Europe.
- Announced during the 2023 G20 New Delhi summit, the project seeks to create a modern trade route that reconnects historical pathways, linking India to Europe via key partners including the United Arab Emirates, Saudi Arabia, Israel, and Greece.

Key Features and Objectives

- **Bifurcated Route:**IMEC is envisioned with two main legs: an eastern corridor that channels container traffic from India to the Gulf region and a northern corridor that connects the Gulf to Europe. This multimodal pathway will integrate high-speed rail, shipping lanes, digital connectivity (through undersea cables), and even renewable energy infrastructure like clean hydrogen pipelines



- **Economic and Logistical Advantages:**The corridor is expected to reduce transit times by up to 40 percent and lower logistics costs significantly. It is

seen as a strategic tool to diversify trade routes away from traditional chokepoints like the Suez Canal

- **Counterbalance to China's Belt and Road Initiative:**IMEC is interpreted as a counterweight to China's Belt and Road Initiative (BRI).

Geopolitical Implications

- **Enhanced Regional Integration:**The corridor is designed to strengthen economic ties and promote regional stability.
- **Strategic Diversification:**In addition to facilitating faster and cheaper trade, IMEC is intended to reduce reliance on existing maritime routes, thereby mitigating vulnerabilities exposed by conflicts. This diversification is critical for future-proofing supply chains.
- **Diplomatic and Economic Synergies:**By linking diverse economies through coordinated infrastructure projects, the corridor can serve as a catalyst for deeper engagement among the participating countries.

Source: [The Hindu](#)

UNITED NATIONS HUMAN RIGHTS COUNCIL (UNHRC)

Context:President Donald Trump signed an executive order withdrawing the US from the United Nations Human Rights Council (UNHRC).

Background:

- Trump pulled the US out of UNHRC in 2018 during his first term in office. Former President Joe Biden reinstated the US' membership of the organization in 2021.

Key takeaways

- **The United Nations Human Rights Council (UNHRC)** is an intergovernmental body within the United Nations system.
- It was established in 2006 to replace the former United Nations Commission on Human Rights. The UNHRC is responsible for strengthening the promotion and protection of human rights around the

globe.

- **Membership:** The Council consists of 47 Member States elected directly and individually by a majority of the 193 UN General Assembly states. Members serve for three-year terms and can serve a maximum of two consecutive terms.
- **Functions:** The UNHRC addresses human rights violations and makes recommendations on them. It holds regular sessions three times a year and can also hold special sessions to respond to urgent human rights situations.
- **Universal Periodic Review (UPR):** The Council reviews the human rights records of all UN Member States through the UPR process.
- **Special Procedures:** The UNHRC appoints independent human rights experts, known as Special Rapporteurs, who monitor and report on human rights situations in specific countries or themes.
- **Commissions of Inquiry:** The Council can authorize commissions of inquiry and fact-finding missions to investigate human rights violations.

Source: [DW](#)

DUNKI ROUTES

Context: A US military aircraft carrying 104 deported Indian nationals landed at Amritsar airport on 5th February 2025. According to the deportees, they spent between Rs 30 lakh and Rs 1 crore in expenses and agent fees in their efforts to reach the US, mostly through what is known as the “dunki route”.

Background: -

- The Trump administration has identified about 20,000 Indian illegal immigrants as part of its mass deportation plan. Indians comprise about 725,000 illegal migrants — the biggest group outside of Central and Latin America.

Key takeaways

- “Dunki” or “donkey journey” refers to the long-winding, often dangerous routes that people across the world take to reach the places they want to immigrate to. These difficult journeys are undertaken due to a lack of requisite legal permits or financial resources. The American authorities have deported those who have taken this illegal route to reach America.
- Deportation is the process of removing a non-citizen for violating immigration law.
- According to the US Immigration and Customs Enforcement’s Fiscal Year 2024 Annual Report, Honduras, Mexico, Guatemala, and El Salvador remain top countries where citizens are deported or repatriated from the US. However, India figures above China and almost equals Brazil.

India Government’s reaction

- After the deportation of the illegal migrants from the USA, the Indian government said that it is considering enacting a new law, tentatively titled ‘Overseas Mobility (Facilitation and Welfare) Bill, 2024’, to establish an enabling framework which will promote “safe, orderly and regular migration for overseas employment”.

- There is a pressing need for comprehensive legislative overhaul to replace the outdated provisions of the Emigration Act 1983.

FAVOURED 'DUNKI' ROUTES

VIA CANADA

- Agents acquire a valid visa for Canada on forged university admission or work permit
- The donkey stays in cold border areas of Canada for a few months
- At an opportune time, the agent sends them across the border—barely a kilometre walk

Cost: ₹80 lakh

VIA TURKEY

- Agents obtain a UK visa on a work permit, basis which the traveller enters Turkey with an e-visa and lives there for 90 days
- In this period, they fly into a safe Central American country, where they stay for a week to a year
- At an opportune time, the agents move them into the US

Cost: ₹80-90 lakh

VIA LATIN AMERICAN AND AFRICAN COUNTRIES

- Agents fly the immigrant to Dubai, Indonesia or Malaysia as a springboard on a valid tourist visa
- Some even fly them to African countries where they cool off for a few months. From there, they charter flights to Latin American

Cost: ₹70-75 lakh

countries such as Bolivia, Guyana, Ecuador, Nicaragua. These countries allow on-arrival visas

- The person traverses harsh terrains to reach Mexico on foot through forests or water routes

Duration: Average six months before they reach the US

Cost: ₹70-75 lakh

- The ministry said that Indian missions/consulates spread awareness amongst emigrants and issued advisories for prospective emigrants. These awareness activities such as advisories equip emigrants with information on safe migration practices, registered recruiting agents, valid foreign jobs, and ways to avoid fraudulent recruiting agencies.

Source: [Indian Express](https://www.indianexpress.com)

SHADOW FLEET BRINGS RISK OF OIL SPILL IN THE BALTIC

Context:As ageing and deficient tankers in the “Russian shadow fleet” traffic the shallow waters of the Baltic Sea, a major oil spill disaster looms, experts say.

Background:

- Security analysts say Russia is operating a large “shadow fleet” of hundreds of vessels, seeking to dodge the sanctions Western nations imposed on its oil exports over its full-scale invasion of Ukraine in 2022.

Key takeaways

- A shadow fleet refers to a group of aging or unregistered vessels that operate outside standard maritime regulations to transport goods—especially sanctioned oil, arms, or illicit cargo—while avoiding detection and international trade restrictions.

Key Features of the Shadow Fleet:

- **Use of Aging & Decommissioned Ships**
 - Many vessels in the shadow fleet are old, poorly maintained, and operate without proper safety inspections.
 - They are often sold by reputable shipping companies to anonymous or shell companies in opaque jurisdictions.

- **Frequent Flag Changes (Flag of Convenience)**
 - These vessels frequently change their flag registrations (e.g., from Panama to Liberia) to evade tracking.
 - They operate under the jurisdiction of countries with lax maritime laws.
- **Manipulation of AIS Transponders (Ghost Ships)**
 - Ships in the shadow fleet turn off their Automatic Identification System (AIS) to disappear from tracking systems.
 - This practice, known as "going dark," is a violation of international maritime law.
- **Ship-to-Ship Transfers (STS Transfers)** : They transfer cargo mid-sea to disguise the origin of oil or goods, making it difficult for authorities to trace their movements.
- **Ties to Sanctioned Nations & Illicit Trade** : Countries like Russia, Iran, North Korea, and Venezuela have been accused of using shadow fleets to bypass U.S. and EU sanctions.

Source: [Hindu](#)

CORRUPTION PERCEPTIONS INDEX

Context: India ranked 96 out of 180 countries on the Corruption Perceptions Index (CPI) for 2024.

Background: -

- The index ranked Denmark at the top, followed by Finland, and Singapore.

Key takeaways

- **The Corruption Perceptions Index (CPI)** is a global ranking that measures perceived levels of public sector corruption across countries.
- **It is published annually by Transparency International**, a non-governmental organization based in Germany.
- The index uses a scale of 0 to 100, where 0 is highly corrupt and 100 is corruption clean. The rank tells the country's position relative to other countries in the index.
- The score for each country is derived from a minimum of three data sources, selected from 13 distinct corruption surveys and assessments. These sources are gathered by a range of reputed organisations, such as the World Bank and the World Economic Forum.
- **Transparency International gave India a CPI score of 38.** In 2023, India's overall score was 39 while in 2022, it was 40. There is a decline in the score of India on CPI.
- The CPI report has also highlighted that corruption is strongly intertwined with climate change. The funds intended to help those suffering from the consequences of global heating are stolen or misused. Corruption also impacts the implementation of policies aimed at addressing climate change leading to further environmental damage.
- Among India's neighbors, Bangladesh has received a score of 23, Pakistan 27, and Sri Lanka 32. Bangladesh is one of the largest recipients of climate finance, which is vulnerable to embezzlement and other forms of corruption.

Source: [Indian Express](#)

BIANNUAL TRANSPARENCY REPORT (BTR)

Context: India is in the final stages of preparing its first ever Biannual Transparency Report (BTR), part of its commitment as a signatory to the 2015 Paris Agreement on climate change.

Background: -

- **The Biennial Transparency Report (BTR) is a reporting mechanism established under the Paris Agreement's Enhanced Transparency Framework (ETF).**

Key takeaways

- The report will be India's official position on its greenhouse gas emissions inventory, key sectors and sources, and steps taken to improve energy efficiency use, as well as the transition to renewable energy sources and the availability of required resources.
- While India has been periodically submitting such information in the form of 'national communications' and 'Biannual Update Reports' (BUR), the BTR is a document that will be subject to technical review by independent, non-Indian, UNFCCC-accredited experts.
- The reports are part of the commitment made by all signatories at the UNFCCC's 21st Conference of Parties (COP), held in Paris in 2015, in a bid to increase transparency. However, it was only at the 2024 COP in Baku that countries actually began submitting BTRs that adhered to the prescribed format.
- While all countries were to have submitted their BTRs by December 2024, several — including India — failed to meet that deadline.

Key Components of the BTR:

- **National Inventory Report (NIR):** An account of greenhouse gas emissions and removals.
- **Progress on Nationally Determined Contributions (NDCs):** Updates on efforts and achievements related to emission reduction targets.
- **Policies and Measures:** Descriptions of strategies implemented to mitigate climate change.
- **Climate Change Impacts and Adaptation:** Information on observed impacts and adaptation actions.
- **Support Provided and Received:** Details on financial, technological, and capacity-building assistance.
- **Capacity-Building Needs and Areas for Improvement:** Identification of areas requiring enhancement to effectively combat climate change. UNFCCC

Source: [The Hindu](#)

INDIA AND QATAR

Context: As Prime Minister Modi and Amir Sheikh Tamim bin Hamad Al Thani held talks in New Delhi, India and Qatar decided to elevate their ties to a "strategic partnership".

Background: -

- Both countries signed two agreements and five MoUs, covering areas like economic cooperation, youth affairs and a double taxation avoidance agreement.

- Within the Gulf Cooperation Council (GCC), India has signed strategic partnerships with the UAE, Saudi Arabia, Oman and Kuwait; Qatar is the latest to join that club.

Key takeaways

THE OUTCOMES

- Expedite negotiations on the India-Qatar Bilateral Investment Treaty.
- Explore a bilateral Comprehensive Economic Partnership Agreement.
- Qatar's commitment to invest USD 10 billion.
- Qatar Investment

- Authority (QIA) to open an office.
- Nationwide rollout of UPI acceptance in Qatar.
- Celebrate India-Qatar Year of Culture, Friendship and Sports in the near future.
- Extension of e-visa facility to Qatari nationals.

- Trade between the two countries is \$14 billion annually, and they set a target to double it to \$28 billion by 2030.

- Qatar's sovereign wealth fund has \$1.5 billion FDI in India, and the joint statement said that the Qatar side announced a commitment to invest USD 10 billion in India.

Bilateral relationship

- Qatar's key exports to India include LNG, LPG, chemicals and petrochemicals, plastics and aluminium articles. India's key exports to Qatar include cereals, copper articles, iron and steel articles, vegetables, fruits, spices, processed food

products, electrical and other machinery, plastic products, construction material, textiles and garments, chemicals, precious stones and rubber.

- Qatar is the largest supplier of LNG to India (10.74 MMT for US\$ 8.32 billion in FY 2022-23), accounting for over 48% of India's global LNG imports. Qatar is also India's largest supplier of LPG (5.33 MMT for US\$ 4.04 billion in FY 2022-23) accounting for 29% of India's total LPG imports.
- Defence cooperation forms an important pillar of the bilateral agenda. India offers training slots in its defence institutions to a number of partner countries, including Qatar.
- As of 2024, Indian population in Qatar forms approximately 25% of Qatar's populace, primarily as migrant workers.

Source: [Indian Express](https://www.indianexpress.com)

CASPIAN PIPELINE CONSORTIUM (CPC)

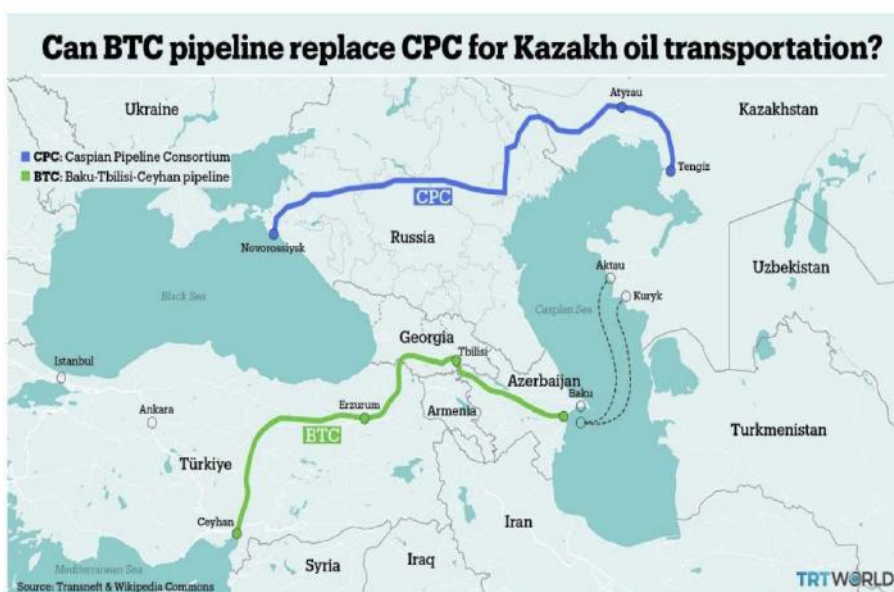
Context: Oil flows through the Caspian Pipeline Consortium (CPC) were reduced by 30-40% after a Ukrainian drone attack on a pumping station.

Background: -

- The attack, which caused no casualties, took place on the eve of talks between the U.S. and Russian officials on ending the war in Ukraine. Following the meeting, from which Kyiv was excluded, Donald Trump's administration said it had agreed to hold more talks.

Key takeaways

- **The Caspian Pipeline Consortium (CPC)** is a significant international oil transportation project involving Russia, Kazakhstan, and leading global oil companies.
- Established to construct and operate a 1,510-kilometer pipeline, the CPC facilitates the movement of crude oil from Kazakhstan's Tengiz oil field to the Novorossiysk Marine Terminal on Russia's Black Sea coast.

Key Features of the CPC:

- **Route and Capacity:** The pipeline transports oil from western Kazakhstan through Russian territory to the Black Sea port of Novorossiysk. As of 2022, it handled approximately 1.2 million barrels per day, accounting for about 1.2% of global oil demand.

- **Shareholders:** The consortium's major stakeholders include Transneft (24%), KazMunayGas (19%), Chevron Caspian Pipeline Consortium Co. (15%), and LUKARCO B.V. (12.5%), among others.

- **Strategic Importance:** The CPC pipeline is crucial for exporting oil from Kazakhstan's significant fields, such as Kashagan and Karachaganak, providing a reliable route to international markets.

Source: [Reuters](#)

UN PEACEKEEPING

Context: External Affairs Minister S Jaishankar highlighted India's commitments to supporting Global South nations in building their peacekeeping capacities at the inaugural 'Conference for Women Peacekeepers from the Global South'.

Background: -

- Since the 1950s, India has contributed over 290,000 peacekeepers across more than 50 UN Peacekeeping missions. Today, more than 5,000 Indian peacekeepers are currently deployed in nine of the 11 active peacekeeping missions.

Key takeaways

- The idea of UN Peacekeeping stems from the UN having no military forces. Therefore, Member States voluntarily provide the military and police personnel that are periodically required for each peacekeeping operation from their national forces.
- Peacekeepers usually wear their countries' uniforms and are identified as UN peacekeepers only by a UN blue helmet or beret and a badge. They are tasked with protecting civilians, actively preventing conflict, reducing violence, strengthening security, and empowering national authorities to assume these responsibilities.
- Officially, they are allowed to use force at a tactical level, with the authorisation of the Security Council, if acting in self-defence and defence of the mandate. In general, a UN peacekeeping operation should only use force as a measure of last resort.
- The first UN peacekeeping mission was established in May 1948, when the UN Security Council authorised the deployment of a small number of UN military observers to the Middle East to

form the United Nations Truce Supervision Organization (UNTSO) to monitor the Armistice Agreement between Israel and its Arab neighbours.

Who funds UN Peacekeeping Missions?

- The UN Security Council makes decisions about establishing, maintaining, or expanding peacekeeping operations, while all UN Member States are collectively tasked with financing them.
- Every member is legally obligated to pay their respective share under Article 17 of the Charter of the United Nations. The United States (26.95%) and China (18.69%) pay the most, partly because they are part of the UNSC. India's share is around 0.2088%.
- Peacekeeping soldiers are paid by their Governments according to their own national rank and salary scale. Countries volunteering uniformed personnel to peacekeeping operations are reimbursed by the UN at a standard rate, approved by the General Assembly, of US\$1,428 per soldier per month as of 1 July 2019.

Source: [Indian Express](#)

INDIA-EUROPE PARTNERSHIP

Context: At a time when ties between Europe and the United States are facing great pressure, a large delegation of European Commission College of Commissioners is in New Delhi for a two-day visit.

Background: -

- The visit of the College of Commissioners marks a significant new phase in bilateral relations, as India and the EU enter the third decade of their Strategic Partnership.

Key takeaways

- India established diplomatic relations with the European Economic Community — the first pillar of the future European Union — back in 1962.
- The multi-tier institutional architecture of cooperation has been presided over by the India-EU Summits, 15 of which have been held so far. The first Summit was held in Lisbon in 2000, and the bilateral relationship was upgraded to a Strategic Partnership at the 5th Summit in The Hague in 2004.
- **The India-EU Strategic Partnership: A Roadmap to 2025**, was adopted at the last India-EU Summit in 2020.

Trade and investments

- India and the EU have been negotiating a Free Trade Agreement for the last decade and a half. The economic argument for an agreement is strong: the EU is India's largest trading partner in goods, and bilateral trade has increased 90% over the past decade.
- Bilateral trade in goods was \$135 billion in FY 2023-24, with Indian exports to the EU accounting for \$76 billion and imports for \$59 billion. Bilateral trade in services in 2023 stood at \$53 billion, comprising Indian exports of \$30 billion and imports of \$23 billion.
- Cumulative Foreign Direct Investment (FDI) flows from the EU during the period April 2000 to September 2024 was \$117.4 billion, which represented 16.6% of the total FDI equity inflow. Indian FDI outflows to the EU are valued at approximately \$40.04 billion for the period April 2000

to March 2024.

Technology cooperation

- Bilateral science and technology cooperation is carried out within the framework of the Science and Technology Cooperation Agreement of 2007.
- The India-EU Intent of Cooperation in High Performance Computing (HPC) was signed in 2022, and in 2023, the two sides signed a Memorandum of Understanding on semiconductor R&D cooperation.

Green energy solutions

- Established in 2016, the EU-India **Clean Energy and Climate Partnership (CECP)** promotes access to and dissemination of clean energy and climate-friendly technologies.
- **The European Investment Bank** has committed to supporting Indian hydrogen projects with funding of 1 billion euros.
- Indian and European companies are collaborating in the renewable and hydrogen sectors with the aim of developing a green hydrogen ecosystem in India by 2030.

People-to-people ties

- The growing Indian diaspora in the EU contains large numbers of students, researchers, and skilled professionals. Indian professionals received the largest share — more than 20% — of EU Blue Cards issued in 2023-24.
- Over the last 20 years, more than 6,000 Erasmus scholarships have been awarded to Indian students. More than 2,700 Indian researchers have been funded by Marie Skłodowska-Curie Actions (part of the EU's research and innovation programme Horizon Europe) since 2014 — the most in the world.

Defence and space

- India and the EU are strengthening their defence cooperation, specially in maritime security and the Indo-Pacific region under ESIWA+ security programme. This is crucial in the context of China's aggressive policies.
- The first joint naval exercises were held in 2023 in the Gulf of Guinea. The two sides have stepped up cooperation on global security, natural disasters, piracy, and counter-terrorism.

Source: [Indian Express](#)



Economy



ECONOMIC SURVEY FOR 2024-25

Context: The Economic Survey for 2024-25 was tabled by Finance Minister Nirmala Sitharaman in Parliament on Friday.

Background: -

- The Survey is a report of the state of the Indian economy in the financial year that is coming to a close. It is prepared by the Department of Economic Affairs in the Union Finance Ministry, under the guidance of the Chief Economic Advisor (CEA).

Key takeaways from Economic Survey

- Real Gross Domestic Product, which maps economic activity from the demand side of the economy, in the current financial year (FY25) is pegged at 6.4%; in the coming year (FY26), the Survey expects it to lie between 6.3% and 6.8%.
- The goal of a '**Viksit Bharat**' in the 100th year of Independence, the Survey's authors emphasised, will require about 8% growth for at least a decade — with the investment rate rising from the current rate of 31% of GDP to 35% of GDP.
- **The survey noted that while the labour share of GVA (gross value added) shows a slight uptick, the disproportionate rise in corporate profits — predominantly among large firms — raises concern about income inequality.** A higher profit share and stagnant wage growth risk are slowing the economy by curbing demand.
- **The Economic Survey** warns that excessive financialisation, driven by rising household savings in the stock market and increased retail investor participation, could harm the economy, especially in a low-middle-income country like India.
- It highlights the risk of financial markets dominating policy decisions, making economic growth overly dependent on asset price inflation and leverage, which could widen inequality and unduly influence regulatory policies.
- India's equity market has rapidly grown particularly after the pandemic, but its debt market remains under capitalised, according to the Economic Survey.
- **Corporate bond issuances** in India for the period April to December 2024 rose to 7.3 lakh crore rupees. Still, the size of India's corporate bond market stands at just 18% of the country's total GDP as against 80% in Korea and 36% in China, the Survey noted. A majority of these funds were gathered by firms through private placements, thus deterring the participation of retail investors.
- India will need to focus on **indigenisation of technology and raw materials** as an "urgent task" to achieve the transition to electric mobility, even as the global automobile industry looks to reduce its dependence on China, the Economic Survey said.
- Pointing towards a decrease in regular jobs, the Survey found that the proportion of self-employed workers in the workforce has risen from 52.2% in 2017-18 to 58.4% in 2023-24. This shift reflects growing entrepreneurial activity and a preference for flexible work arrangements,

the Survey claimed.

- It added that the agriculture sector still remains dominant in employment, with its share rising from 44.1% in 2017-18 to 46.1% in 2023-24. The share of workers (male and female) in regular or salaried jobs decreased from 22.8% to 21.7% during the same period. The decline in casual workers, from 24.9% to 19.8%, also indicates a shift toward more structured forms of self-employment.
- **Micro, Small and Medium-scale Enterprises (MSMEs)** that employ 23.24 crore people in the country continue to face challenges in the regulatory environment, the Survey noted. Regulatory compliance burden holds back formalisation and labour productivity, limits employment growth, chokes innovation and depresses growth, it said.
- There is an observed tendency for MSMEs in India to remain small. So, they lose access to capital, talent, and technology infusion and often operate outside the formal supply chains. This creates a parallel, informal economy, the Survey noted. The logic for staying small often is to remain under the regulatory radar and steer clear of the rules and labour and safety laws.
- Overexposure to social media, lack of exercise, not spending enough time with one's family and overwork (hours exceeding 55-60 per week) have all worsened mental well-being among Indians, said the Economic Survey 2024-25.
- Establishing a link between good mental health and clean eating habits, the Survey noted that individuals who rarely consume ultra-processed or packaged junk food have better mental well-being than those who regularly do so.

Source: [The Hindu](#)

DISCOVERY OF POTASH RESERVES

Context: Punjab Mining Minister Barinder Kumar Goyal said the government will explore potash mining in Fazilka and Sri Muktsar Sahib districts, where surveys previously detected large mineral reserves in three mining blocks.

Background: -

- **Surveys of the Geological Survey of India (GSI)** have also identified reserves in parts of Rajasthan. These findings highlight the potential for potash mining in both states, reducing India's dependence on imports and bolstering the domestic fertilizer industry.

Key takeaways

- Potash refers to potassium-bearing minerals that are primarily used in fertilisers. Over 90% of potash is used as fertilizer and it is one of the three primary agricultural nutrients (Nitrogen, Phosphorus and Potassium or N-P-K).
- While all potash fertilizers contain potassium there are a number of different forms in which it exists. **Among these forms is Sulphate of Potash (SOP)**, a premium potash fertilizer that is free of chloride (a compound considered harmful to plants). On the other hand, Muriate of Potash or MOP contains some chloride.
- While SOP is used primarily on high-value crops, usually leafy plants, fruits and vegetables, MOP is commonly used on carbohydrate-type crops, such as wheat.

Where were potash reserves found?

- Punjab is now the second state after Rajasthan to have significant potash reserves. In Rajasthan, potash deposits were mainly found in the northwestern Nagaur-Ganganagar basin.
- **According to the National Mineral Inventory (NMI) database**, the total potash resources are estimated at 23,091 million tonnes in 2020. Rajasthan alone contributes 89% to the total resources.
- However, despite having substantial reserves, exploration and extraction have been delayed. So far, India has not engaged in potash mining.
- As of now, the country is completely dependent on imports.

Source: [Indian Express](#)

GROSS DOMESTIC KNOWLEDGE PRODUCT

Context: In a revival of an idea that had been shelved in 2021, the government is looking to capture the knowledge economy as a metric to supplement the Gross Domestic Product (GDP).

Background: -

- **The Ministry of Statistics and Programme Implementation (MoSPI)** had a session on “Conceptual Framework of Gross Domestic Knowledge Product (GDKP) Measurement”, chaired by Principal Scientific Advisor Ajay Kumar Sood.

Key takeaways

- **The Gross Domestic Knowledge Product (GDKP)** is an innovative metric designed to assess a nation's economic progress by focusing on its knowledge-based assets and activities.
- **The concept of Gross Domestic Knowledge Product (GDKP) is not a standard economic term like Gross Domestic Product (GDP)**, but it can be understood as a theoretical or emerging framework that measures the economic value generated from knowledge-based activities, innovation, and intellectual capital within a country.
- **Focus:** It emphasizes the role of knowledge, information, and creativity as key drivers of economic growth in the modern economy.
- At present, all expenditures on **Intellectual Property Products (IPP)** are recorded under **Gross Fixed Capital Formation (GFCF)** — the indicator for capital investments in the GDP dataset for the economy.
- GDKP was discussed earlier in 2021 when NITI Aayog made a presentation on the concept note. The National Statistical Commission had pointed out then that the concept note did not provide the methodology for capturing the data and computation of GDKP.

Source: [Indian Express](#)

SOVEREIGN GREEN BONDS

Context: India's push to fund green investments through Sovereign Green Bonds (SGrBs) is facing muted investor demand, restricting the Union government's ability to secure a meaningful green premium—lower yields compared to regular bonds—from the debt market.

Background: -

- When the **Reserve Bank of India (RBI)** auctioned two new SGrBs worth Rs 10,000 crore in November and January, bonds valued at Rs 7,443 crore remained unsold and were devolved to primary dealers as investors sought high yields. This came despite a rule change allowing NRIs and foreign portfolio investors to participate without restrictions.

Key takeaways

- **Sovereign Green Bonds (SGrBs)** are debt instruments issued by governments to finance environmentally sustainable projects.
- In November 2022, the Indian government approved the Sovereign Green Bonds framework, outlining the deployment of proceeds in public sector projects that aid in decreasing the economy's emissions intensity.
- **A 'green project' classification is based on the following principles:**
 - Encourages energy efficiency in resource utilization
 - Reduces carbon emissions and greenhouse gases
 - Promotes climate resilience and/or adaptation
 - Values and improves natural ecosystems and biodiversity especially in accordance with SDG principles
- Government of India will use the proceeds raised from **Sovereign Green Bonds (SGrB)** to finance and/or refinance expenditure (in parts or whole) for eligible green projects falling under 'Eligible Categories'.
- **Excluded Projects :**
 - Projects involving new or existing extraction, production and distribution of fossil fuels, including improvements and upgrades; or where the core energy source is fossil-fuel based
 - Nuclear power generation
 - Direct waste incineration
 - Alcohol, weapons, tobacco, gaming, or palm oil industries
 - Renewable energy projects generating energy from biomass using feedstock originating from protected areas
 - Landfill projects
 - Hydropower plants larger than 25 MW

Source: [Indian Express](#)

DEPOSIT INSURANCE

Context: The government is considering increasing the insurance cover for bank deposits from the current limit of Rs 5 lakh.

Background: -

- Deposit insurance was introduced in India in 1962, and coverage has thus far been enhanced six times – from Rs 1,500 per depositor held in the same right and same capacity at all the branches

of the insured bank to Rs 5 lakh now.

Key takeaways

- The deposit insurance cover is offered by the **Deposit Insurance and Credit Guarantee Corporation (DICGC), a specialised division of the Reserve Bank of India (RBI).**
- The objective of the DICGC is to protect “**small depositors**” from the risk of losing their savings in case of a bank failure.
- The insurance cover of Rs 5 lakh per depositor is for all accounts held by the depositor in all branches of the insured bank.
- DICGC insures all commercial banks, including branches of foreign banks functioning in India, local area banks, regional rural banks, and cooperative banks. However, primary co-operative societies are not insured by the DICGC.
- **Savings, fixed, current, and recurring deposits are insured.** The DICGC does not provide insurance for deposits by foreign, central, and state governments, and for inter-bank deposits.
- **The premium for deposit insurance is borne by the insured bank.** DICGC collects premiums from member financial institutions at a flat or differentiated rate based on the bank’s risk profile.

How does the limit for DICGC’s insurance coverage work?

- **In 2021, a new Section 18A was inserted in the DICGC Act, 1961,** which enabled depositors to get interim payment and time-bound access to their deposits to the extent of the deposit insurance cover through interim payments by DICGC, in case of imposition of restrictions on banks by the RBI.
- At present, the **DICGC offers insurance cover on bank deposits up to Rs 5 lakh within 90 days of imposition of such restrictions.**
- **Since the DICGC insures both the principal and interest amount held by a depositor in a bank, this is how the cover works:**
 - Say, a depositor has Rs 4,99,800 in her account, which includes the principal amount of Rs 4,90,000 and Rs 9,800 as interest accrued on it. In this case, the DICGC will provide insurance for Rs 4,99,800, which essentially means the depositors will get Rs 4,99,800 if their bank fails
 - However, if the principal amount is Rs 5,00,000 (or more), and the interest accrued is Rs 10,000, the interest accrued will not be covered, as the depositor would have exhausted the cover limit of Rs 5 lakh.
- If the bank goes into liquidation, DICGC is liable to pay to the liquidator the claim amount of each depositor up to Rs 5 lakh within two months from the date of receipt of the claim list from the liquidator.
- The liquidator will have to disburse the right claim amount to each insured depositor.

Source: [Indian Express](#)

CONSUMPTION, INVESTMENT AND GROWTH

Context: The role of consumption and investment in driving growth has been a topic of debate. In the latest Budget, the government has not demonstrated a strong commitment to boosting investment. Instead, the emphasis on tax concessions and restrained public spending suggests a reliance on consumption to drive growth.

Background:

- An economy's growth depends on two factors. One is the supply or the production of goods and services, and the other is the demand or expenditure for purchasing these goods and services.

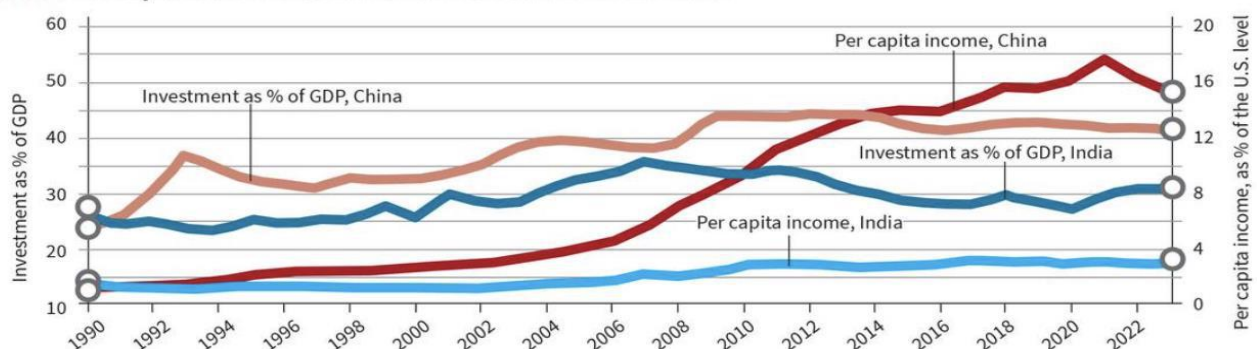
Key takeaways

- **The demand or aggregate expenditure in an economy comes from four sources.**
 - First is private consumption, which is the sum of expenditures by all individuals on items such as food, clothing, and mobile phones.
 - Second is private investment, which is the amount spent by firms and households on installing new machines and constructing new factories or residences.
 - Third is government expenditure, for consumption and investment.
 - Fourth is net exports or exports minus import of goods and services while engaging in trade with the rest of the world.

Investment and its multipliers

- Among the sources of demand, investment stands out for its 'multiplier effects'. That is, an increase in investment of ₹100 could increase the economy's overall demand and GDP by more than ₹100 — let us say by ₹125.
- **Consider public investment in building a new highway.** The incomes received by workers and firms involved in the project will generate fresh demand in the economy. The highways will trigger the establishment of new industries, all of which translate into a much bigger expansion of aggregate demand.
- Compared to investment, the multiplier effect from increased consumption is weaker. If incomes increase, consumption expenditures also increase, but the relation does not work strongly enough in the reverse direction. A rise in consumption cannot lift incomes as much in the rest of the economy.

Chart 1: Per capita income and investment rates in India and China



Indian and Chinese experiences

- In the early 1990s, the per capita incomes of India and China were almost the same. But by 2023,

China's per capita income has grown to five times as high as the Indian level (2.4 times as high if purchasing power differences between the two countries are considered). The speedy growth of incomes in China has been led by investment.

- India's economic growth over the last decade has been driven mainly by expanding domestic consumption expenditures. In 2023, consumption as a share of GDP was 60.3% in India compared to 39.1% in China.
- The dominance of consumption in India's GDP structure is mainly due to the weaknesses of the other components of aggregate demand in the country. The shares of investment and government consumption expenditure are relatively low.
- India also has a trade deficit, with its import of goods and services being larger than its exports, reducing domestic demand.
- Economic growth driven by consumption is not only slower than investment-led growth, but it also aggravates inequalities. The growth of jobs, incomes, and consumption has remained depressed for many Indians, and they will be left behind.

Source: [The Hindu](#)

STAGFLATION

Context: Stubborn inflation and President Donald Trump's hard-line trade policies have rekindled fears of stagflation, a worrying mix of sluggish growth and relentless inflation that haunted the U.S. in the 1970s.

Background:

- A critical component of the stagflation phenomenon—persistently high inflation—became more pronounced earlier this month when data revealed that consumer prices in January experienced their most rapid monthly increase since August 2023.
- Meanwhile, the trajectory of U.S. economic growth remains uncertain, with the potential inflationary impact of Mr. Trump's tariffs posing a risk that could further exacerbate the situation.

Key takeaways

- Stagflation is a rare economic condition where high inflation coexists with stagnant economic growth and high unemployment. This phenomenon contradicts conventional economic theories, which suggest that inflation and economic growth generally move in the same direction.

Understanding Stagflation:

- The term "stagflation" is a combination of stagnation (slow or no economic growth) and inflation (rising prices).
- Typically, inflation is associated with economic expansion, but in stagflation, rising prices occur alongside weak demand and high unemployment.

Causes of Stagflation:

- **Supply-Side Shocks:** A sudden increase in the cost of essential goods (e.g., crude oil prices) can drive inflation while simultaneously slowing economic activity.
- **Monetary Policy Failures:** Excessive money supply without corresponding economic growth can lead to inflation without boosting employment or output.

- **Structural Rigidities:** Labor market inefficiencies, lack of productivity growth, and supply chain disruptions can contribute to stagnant growth and rising inflation.
- **External Factors:** Geopolitical tensions, trade restrictions, and commodity price volatility can create stagflationary conditions.
- **Historical Example:** The 1970s Oil Crisis is a classic example, where oil price shocks caused high inflation while economies faced recessionary pressures.

Impact of Stagflation:

- **Economic Growth Decline:** Businesses struggle due to high costs, reducing production and investments.
- **Unemployment Increases:** Job losses occur as firms cut back on hiring due to weak demand.
- **Declining Purchasing Power:** Rising prices erode consumer savings and wages, impacting living standards.
- **Policy Dilemma:** Central banks face difficulty in addressing stagflation since measures to curb inflation (e.g., high interest rates) can further slow growth, while stimulus measures (e.g., low interest rates) can worsen inflation.

Source: [The Hindu](#)

INTERNATIONAL FINANCE CORPORATION

Context: Following opposition from local communities, environmentalists and civil society groups, the World Bank has said that it will not invest in four waste-to-energy (WTE) incineration plants in Gujarat.

Background: -

- According to a press release by civil society group Alliance for Incinerator Free Gujarat, the **World Bank's International Finance Corporation (IFC)** – the private lending arm of the World Bank – confirmed to the NGO after it filed for an access to information request that it would not be investing in the WTE incineration plants in Gujarat.

Key takeaways

- **The International Finance Corporation (IFC)**, a key institution of the World Bank Group, plays a crucial role in promoting private sector development in emerging economies by providing investment, advisory, and asset management services.
- **Established:** 1956
- **Headquarters:** Washington, D.C., USA
- **Parent Organization:** World Bank Group
- **Membership:** 186 countries

Objectives of IFC:

- To promote private sector development in developing countries.
- To provide financial assistance to businesses and entrepreneurs where traditional financial institutions are reluctant to invest.
- To reduce poverty by fostering economic growth through private sector investments.
- To support sustainable development by financing projects with environmental and social benefits.

Functions of IFC:

- **Financing Private Sector Projects:** Provides loans, equity investments, and guarantees to private enterprises.
- **Mobilizing Capital:** Helps attract private investors and financial institutions to invest in developing economies.
- **Advisory Services:** Offers expertise in corporate governance, financial structuring, and policy reforms.
- **Promoting Sustainable Development:** Invests in environmentally friendly and socially responsible projects.

IFC & India:

- India is one of the largest recipients of IFC funding.
- IFC has invested in renewable energy, infrastructure, banking, and microfinance sectors in India.
- Supports MSMEs (Micro, Small, and Medium Enterprises) and start-ups.
- Aims to facilitate green financing and sustainable urban development in India.

Source: [The Wire](#)

QUALIFIED INSTITUTIONS PLACEMENT (QIP)

Context: Shareholders of Indian Renewable Energy Development Agency Ltd. (IREDA) have approved the company's proposal to raise up to ₹5,000 crore through Qualified Institutions Placement (QIP) of equity shares, in one or multiple tranches.

Background: -

- The approval was granted by the shareholders in favour of the resolution via remote e-voting during the **22nd Extra-Ordinary General Meeting (EGM)** held on Tuesday through video conferencing.

Key takeaways

- **A Qualified Institutional Placement (QIP)** is a capital-raising tool used by listed companies in India and other Southeast Asian countries.
- It allows these companies to raise funds by issuing equity shares, non-convertible debt instruments, and convertible securities to Qualified Institutional Buyers (QIBs) without having to go through the lengthy and complex regulatory compliance required for other methods like follow-on public offerings (FPOs) or rights issues.

Key Features of QIP:

- **Purpose:** QIPs were introduced by the Securities and Exchange Board of India (SEBI) in 2006 to reduce the dependence of Indian companies on foreign capital and encourage them to raise funds domestically.
- **Qualified Institutional Buyers (QIBs):** Only QIBs can participate in QIPs. QIBs include mutual funds, venture capital funds, foreign institutional investors, public financial institutions, scheduled commercial banks, insurance companies, and pension funds.
- **Advantages:** QIPs offer a quicker and more efficient way for companies to raise capital. They avoid the time-consuming procedural requirements and are less expensive than raising capital through American Depositary Receipts (ADRs) or Global Depositary Receipts (GDRs).

- **Pricing:** The issue price of a QIP must be not less than the average of the weekly high and low of the closing prices over the past two weeks. This ensures that shares are not allotted at a price lower than the market value.
- **Lock-in Period:** Securities allotted in a QIP are subject to a lock-in period of six months from the date of allotment. This is intended to ensure that only QIBs with a medium to long-term view participate in the issue.

Procedure:

- **Approval:** The company must obtain approval from its board of directors and shareholders to proceed with a QIP.
- **Merchant Banker:** A merchant banker is appointed to manage the issue and act as an intermediary between the company and the QIBs.
- **Offer Document:** The company prepares an offer document containing details about the issue, which is shared with the QIBs.
- **Allotment:** The securities are allotted to the QIBs based on their bids, and the funds are raised.

Source: [The Hindu](#)



GEOGRAPHY



SEA OF OKHOTSK

Context:Japan scrambled fighter jets after Russian bombers flew over international waters around the country.

Background: -

- Russia's Defense Ministry said that two long-range bombers flew over international waters in the Sea of Japan and the Sea of Okhotsk.

Key takeaways



- **The Sea of Okhotsk** is a marginal sea of the Pacific Ocean, located between Russia and Japan.

- **It is bordered by:**

- The Kamchatka Peninsula to the east
- The Kuril Islands to the southeast
- The Sakhalin Island to the west
- The Siberian coast to the northwest
- The Hokkaido Island (Japan) to the south

- The sea remains frozen for nearly six months a year, from November to May, due to extreme cold in Siberia.

- It is one of the world's iciest seas, significantly affecting navigation and fishing activities.

- **Rich in Marine Resources:** Supports fishing industries of Russia and Japan, with abundant salmon, herring, and crab.
- **Energy Reserves:** Contains oil and natural gas fields.
- Disputes exist between Russia and Japan over the Kuril Islands, which affect territorial claims in the Sea of Okhotsk.

Source:[The Hindu](#)

ARAKU VALLEY

Context:The three-day Araku Utsav titled 'Chali' concluded on a grand note in **Araku Valley of Andhra Pradesh's Alluri Sitharama Raju (ASR) district.**

Background: -

- Adivasis from the northeast, Jharkhand, Chhattisgarh, Odisha and Rajasthan also put up their performances during the three-day festival. Tribal groups from ASR district performed the famous Dhimsa dance.

Key takeaways

- Araku Valley is a scenic hill station located in the Eastern Ghats in Andhra Pradesh.
- **Location:** Situated in the Alluri Sitharama Raju district of Andhra Pradesh.
- **Elevation:** Around 1,200 meters above sea level.
- **Climate:**
 - Receives significant rainfall during the monsoon (June–September).
 - Winters (December–February) are pleasant with temperatures dropping to 5–10°C.
- **Flora & Fauna**
 - Part of the Eastern Ghats' biodiversity hotspot.
 - Dense tropical forests, with species like teak, bamboo, and medicinal plants.
 - The Anantagiri and Sunkarimetta Reserved Forest, which are part of Araku Valley, are rich in biodiversity and are mined for bauxite.
 - Home to various wildlife species such as Indian bison (gaur), leopards, and peacocks.

Economic Importance

- **Coffee Plantations:**
 - Araku Valley is famous for organic coffee cultivation.
 - It has received a Geographical Indication (GI) tag.
- **Tourism:** Popular attractions:
 - Borra Caves (limestone caves with stalactites & stalagmites).
 - Katiki Waterfalls.
 - Padmapuram Gardens.
 - Dumbriguda Chaparai (a natural rock formation with waterfalls).

Source: [The Hindu](#)

PINEAPPLE EXPRESS

Context: Following an unusually dry January, a powerful atmospheric river known as the ‘Pineapple Express’ has been sweeping through northern and central California, bringing periods of strong winds, heavy rain, and snowfall in the hills.

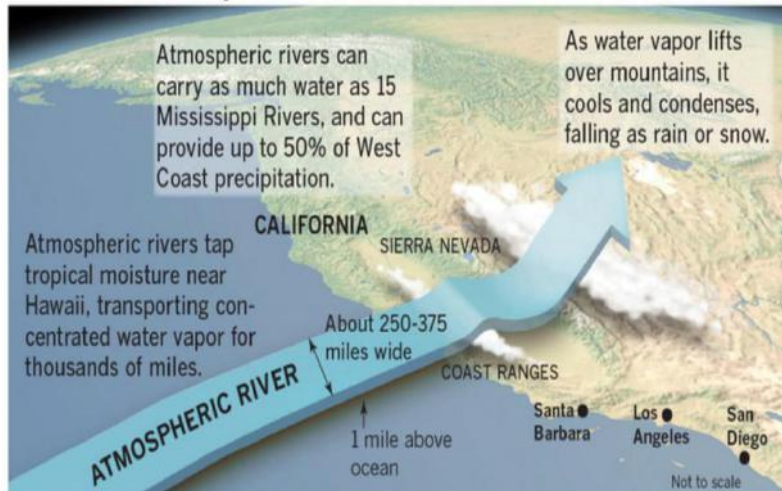
Background: -

- Pineapple Express gets its name from the warm, moist air drawn into the system, originating near Hawaii, a region known for its pineapple production.

Key takeaways

- **Pineapple Express is a type of atmospheric river**— a narrow, fast-moving “river in the sky” that transports significant moisture over long distances. The warm air and high humidity it carries from the Pacific lead to heavy rainfall when the system reaches land.
- The atmospheric rivers are long, narrow bands in the atmosphere that transport vast amounts of water vapour from the tropics. Their size and strength can differ significantly, but on average, they carry a volume comparable to the flow of the Mississippi River at its mouth. Exceptionally strong atmospheric rivers can transport up to 15 times that amount.

How an atmospheric river works



- When atmospheric rivers make landfall, they typically release this moisture as rain or snow, often covering a vast region as they move inland.

- The atmospheric rivers in the sky occur often on the West Coast but can happen in other locations, including the eastern United States, where they often channel moisture from the Caribbean. When this moisture begins to interact with land, it can fall as rain or snow.

- Although atmospheric rivers come in different shapes and sizes, for one to be a

“true Pineapple Express,” location matters. The tail end, where the moisture is pulled into the atmosphere, must start near Hawaii. Then the river must stretch continuously through the atmosphere to the US West Coast.

Source: [Indian Express](#)

ATACAMA DESERT

Context: Astronomers are sounding alarm bells as a precious sky-observing location faces risk of being blinded by light pollution due to a planned renewable energy project. U.S. company AES Energy wants to build a large renewable hydrogen manufacturing complex in Chile, only a few kilometers from the summit of **Mount Paranal, the site of the European Southern Observatory's (ESO) Very Large Telescope (VLT).**

Background: -

- Mount Paranal, an 8,740-foot-high (2,664 m) peak in the Atacama Desert of Northern Chile, is one of the last spots on Earth free from urban and industrial light pollution.

Key takeaways

- **The Atacama Desert**, located in northern Chile, is one of the driest places on Earth and holds significant geographical, climatic, and scientific importance.
- **Location:** Western South America, along the Pacific coast, between the Andes Mountains and the Chilean Coastal Range.
- **Climate:** Hyper-arid with minimal rainfall due to the rain shadow effect of the Andes and the influence of the Humboldt Current and Subtropical High-Pressure Belt.
- **Temperature:** High diurnal temperature variation with hot days and cold nights.

Importance

- **The desert contains several salt flats (salares)** and high-altitude lagoons, such as the Salar de Atacama, which is rich in lithium deposits.
- **The Salar de Atacama** holds one of the largest lithium reserves globally, which is crucial for battery production in electric vehicles and renewable energy storage.



- **The Atacama Desert** is rich in mineral resources, particularly copper and lithium. Chile is one of the world's largest producers of both.

- Home to unique microbial life, studied for its resemblance to Martian conditions.

- Ideal for astronomical observations due to its clear skies, low humidity, and high altitude.

- Hosts world-class observatories like the **European Southern Observatory (ESO)** and **ALMA (Atacama Large Millimeter Array)**.

Source: space.com

BALTIC STATES SWITCH TO EUROPEAN POWER GRID, ENDING RUSSIA TIES

Context: Three Baltic states disconnected their electricity systems from Russia's power grid, the region's operators said, part of a plan designed to integrate the countries more closely with the European Union and boost security.

Background: -

- **Estonia, Latvia and Lithuania** disconnected from the IPS/UPS joint network and, subject to last-minute tests, they will synchronise with the EU's grid after operating on their own in the meantime.

Key takeaways

- **Plans for the Baltics** to decouple from the grid of their former Soviet imperial overlord, debated for decades, gained momentum following Moscow's annexation of Crimea in 2014.
- The grid was the final remaining link to Russia for the three countries, which reemerged as independent nations in the early 1990s at the fall of the Soviet Union, and joined the European Union and NATO in 2004.
- The three staunch supporters of Kyiv stopped purchases of power from Russia following Moscow's invasion of Ukraine in 2022, but have relied on the Russian grid to control frequencies and stabilise networks to avoid outages.
- The Baltic Sea region is on high alert after power cable, telecom links and gas pipeline outages between the Baltics and Sweden or Finland. All were believed to have been caused by ships dragging anchors along the seabed following Russia's invasion of Ukraine. Russia has denied any involvement.



- For Russia, the decoupling means its Kaliningrad exclave, located between Lithuania, Poland and the Baltic Sea, is cut off from Russia's main grid, leaving it to maintain its power system alone.

- The Baltic countries spent nearly 1.6 billion euros (\$1.66 billion) since 2018 to upgrade grids to prepare, while Moscow has spent 100 billion roubles (\$1 billion), including on the building of several gas-fired power plants in Kaliningrad.

Source: [Indian Express](#)

EARTHQUAKES IN DELHI

Context: Delhi frequently experiences earthquakes, often originating from distant regions. However, the magnitude 4 earthquake that struck before dawn on Monday was distinct, as its epicenter was within Delhi itself, near Dhaula Kuan.

Background:

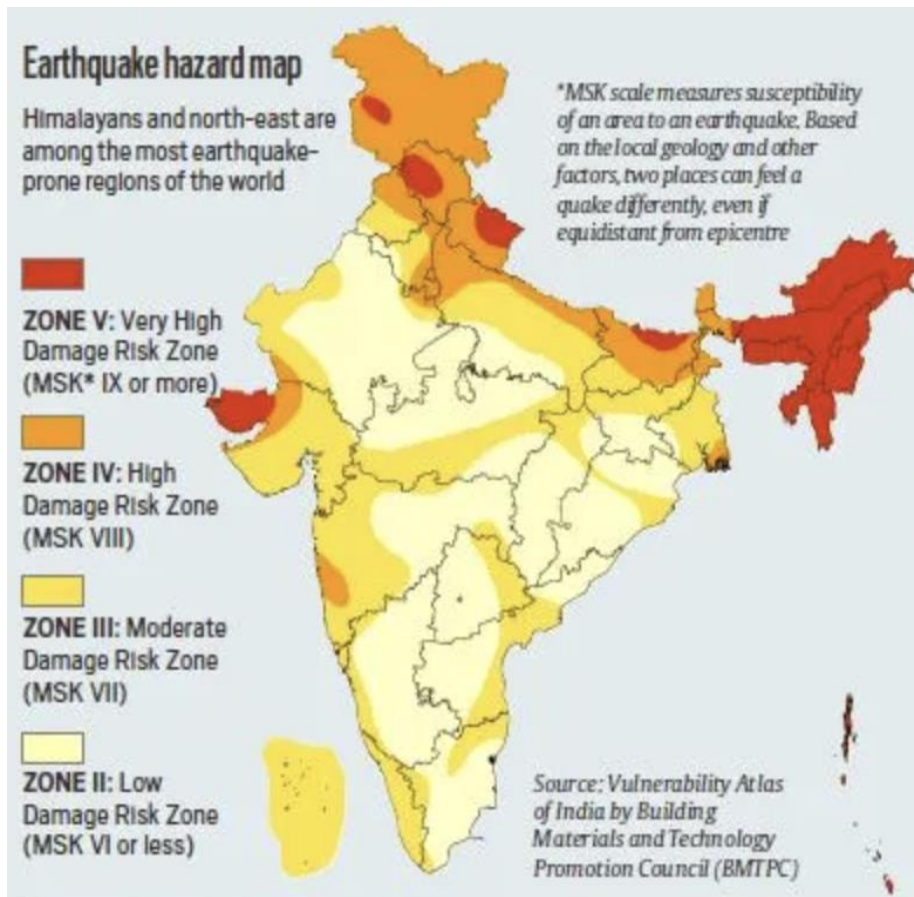
- **Magnitude 4 earthquakes** are not very strong, and do not result in much damage.

Key takeaways

- Delhi lies in a seismically active area. India's official earthquake hazard map puts Delhi in Zone 4, the second highest classification of areas based on their susceptibility to shaking experienced during an earthquake.
- Zone 4 in India includes areas that are expected to experience MSK-8-level intensity during an earthquake. **The MSK, or Medvedev-Sponheuer-Karnik** scale is a measure of intensity, rather than strength, or energy released, which is described by magnitude.
- Simply put, the MSK scale measures the susceptibility of an area to an earthquake. Based on the local geology and other factors, two places can feel, and be impacted by, a quake very differently, even if they are equidistant from its epicentre.
- Delhi falls in a region that has high susceptibility to quakes. MSK-8 means the area is vulnerable to major damage being caused to buildings and other infrastructure.
- Zone 5, the most vulnerable areas in India, correspond to MSK-9 levels of intensity or higher.

Aravalli-Delhi Fold Belt

- Delhi lies in what is known as the Aravalli-Delhi Fold Belt, a seismically-active geological belt extending from southern and eastern Rajasthan to Haryana and Delhi.
- This region is characterised by the presence of deformed layers of rock that have been folded or bent due to geological processes hundreds of millions of years ago. These deformities have created stress which is sometimes released in the form of earthquakes.



Source: [Indian Express](#)

- This is a very different mechanism from the one that triggers earthquakes in the Himalayan region. The Himalayan region has been witnessing the subduction of the Indian tectonic plate under the Eurasian plate — one pushing against the other — which results in a lot of stress building up.

- The Aravalli-Delhi Fold Belt** was much more seismically active in the past than it is now. Over the years, the tectonic activity in the region has slowed down considerably, leading to greater geological stability. But some faults still remain, which give rise to occasional mild earthquakes.

DARIEN GAP

Context: Migrants seeking entry into the US continue to resort to the infamous Darien Gap, an unforgiving expanse of jungle between Panama and Colombia. They are led by unscrupulous human traffickers who prey on their desire to seek a better life.

Background: -

- The majority of migrants hail from Latin America and are fleeing poverty, economic instability, and political turmoil in their home countries. However, an increasing number of people from Asian countries like India have frequented this route, spending large amounts of money.

Key takeaways

- Location:** The Darien Gap is a dense, roadless jungle region on the border of Panama and Colombia.
- Physical Features:** It consists of swamps, rainforests, and rugged mountains, making it one of the most inaccessible regions in the world.
- Obstacle to the Pan-American Highway:** This is the only missing section (about 106 km) in the otherwise continuous Pan-American Highway, which extends from Alaska to Argentina.

Strategic & Geopolitical Importance

- Migration Route:** It has become a major passage for migrants from South America, Africa, and even Asia attempting to reach North America.

- **Security Issues:** The area is notorious for drug trafficking, organized crime, and armed groups operating in the region.
- **Environmental Conservation vs. Development:** Proposals to build roads through the Darién Gap face opposition due to concerns about deforestation, indigenous rights, and biodiversity loss.



Environmental & Ecological Concerns

- **Biodiversity Hotspot:** It is home to endangered species and a vital part of the Mesoamerican Biological Corridor.
 - **Portions of the Darién Gap are protected as national parks and reserves, such as Darién National Park in Panama, a UNESCO World Heritage Site.**
 - **Climate Change & Deforestation:** Logging, illegal settlements, and infrastructure development threaten the unique ecosystem.
- **Indigenous Communities:** Several indigenous tribes, including the Emberá and Wounaan, inhabit the region and rely on traditional means for survival.

Source: [Indian Express](#)



Environment and Ecology



GUNERI INLAND MANGROVES

Context: The 32.78 hectare area of Guneri village in Lakhtar tehsil of Kutch district, which is a natural inland mangrove site, has been declared as the first Biodiversity Heritage Site (BHS) of Gujarat.

Background:

- The announcement has been done under the provisions of The Biodiversity Act, 2002. The Act empowers the state government to notify an area as a BHS after consulting concerned local bodies.

Key takeaways

- **Inland mangroves** are rare and have been reported from only eight locations across the globe till date. **The Guneri inland mangrove site is the last remains of its kind in India.**
- **Mangroves** are typically sighted at the sea coast which is sludgy and accessed by seawater at least once every day. However, the **Guneri mangrove site** is located at a distance of 45 km from the Arabian Sea and four km from the **Kori Creek**, where seawater never approaches. It is also devoid of any sludge, and is spread over a flat piece of land like a forest.
- **The Guneri inland mangroves** are presumed to have originated either after the marine transgression which occurred in the area during the Miocene period or on the bank of the lost river **(the Saraswati River) in the Great Rann of Kachchh. The Saraswati, a mythological river, is assumed to have once run in the Great Rann of Kachchh during 3000-4000 B.C.**
- Studies have reported that the inland mangroves survive in areas having limestone deposition which connects with the sea bed. The limestone provides a continuous flow of groundwater to the mangrove ecosystem/vegetation.
- **The Western Kutch and areas surrounding the Guneri mangroves have records of limestone depositions.**

Source: [Indian Express](#)

CLIMATE RISK INDEX (CRI)

Context: India is among the nations hit hardest by extreme weather over the past 30 years, according to the newly released 2025 Climate Risk Index (CRI).

Background: -

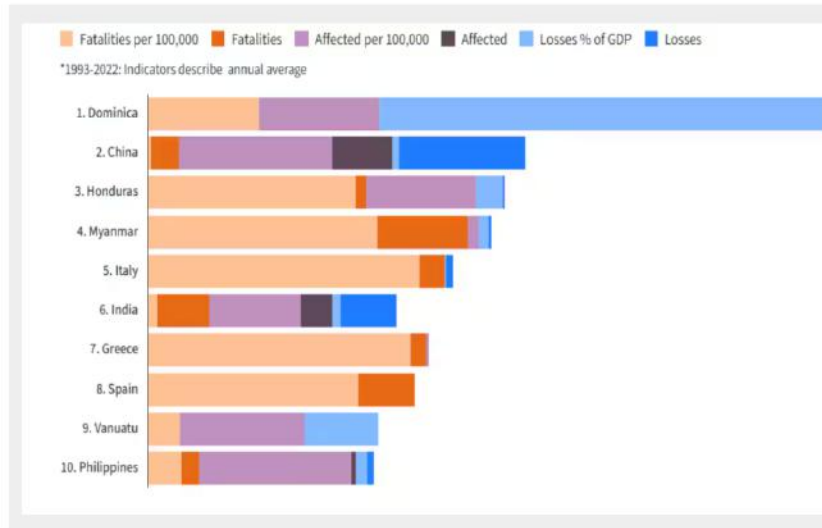
- Between 1993 and 2022, the country endured more than 400 extreme events — including floods, heatwaves, and cyclones — leading to 80,000 fatalities and economic losses nearing \$180 billion.

Key takeaways

- **The Climate Risk Index (CRI)** is an analytical tool developed by the **non-governmental organization Germanwatch** to assess the impacts of extreme weather events on countries and regions.
- It evaluates both economic losses and human fatalities resulting from such events over specific periods, providing insights into countries' exposure and vulnerability to climate-related hazards.

Key Features of the Climate Risk Index:

- **Assessment Parameters:** The CRI analyzes data on extreme weather events and their associated impacts. It considers metrics such as the number of fatalities, economic losses (both absolute and relative to GDP), and the frequency of events.

10 most climate change affected countries (between 1993-2022)

- **Timeframes:** The index offers both annual assessments and long-term evaluations, typically spanning 20 to 30 years.

- **Purpose:** By highlighting the countries most affected by extreme weather events, the CRI aims to raise awareness about the need for climate adaptation and mitigation strategies.

Recent Findings:

- **According to the Global Climate Risk Index 2025**, India has shown improvement in its ranking.

- **In 2019, India was the 7th most affected country globally due to extreme weather events, but by 2022, it improved to the 49th position.** However, in the long-term assessment from 1993 to 2022, India remains among the top 10 most affected countries, ranking 6th.

Source: [Business Standard](https://www.business-standard.com)

ARAVALI SAFARI PARK

Context: The Haryana government's ambitious 3,858 hectare **Aravali safari park project spread across Gurugram and Nuh** is envisaged to be the world's largest safari park. However, the project has faced stiff opposition ever since it was first mooted.

Background: -

- **A group of 37 retired Indian Forest Service officers** have written a letter to Prime Minister seeking to scrap the project arguing that the project's aim is to simply increase tourist footfall and not conserve the mountain range.

Key takeaways

- **The hills in the southern districts of Gurugram and Nuh are a part of Aravali**, the oldest fold mountain range in the world.
- Aravali runs diagonally across Rajasthan extending from Champaner in Gujarat in the southwest to near Delhi in the northeast for about 690 km.
- It is ecologically significant as it combats desertification by checking the spread of the Thar Desert towards eastern Rajasthan, and performs the role of an aquifer with its highly fractured and weathered quality rocks allowing water to percolate and recharge the groundwater.

What are the laws protecting Aravali?

- Of the approximately 80,000 hectare Aravali hill area in Haryana, a majority is protected under various laws and by orders of the Supreme Court and NGT.
- The most widespread protection to the Aravalis comes from the **Punjab Land Preservation Act (PLPA), 1900**. The Special Sections 4 and 5 of the Act restrict the breaking of land and hence deforestation in hills for non-agricultural use.
- Recently around 24,000 hectares has been notified as Protected Forest under the Indian Forest Act, as a proposed offset to forest land diversion in the **Nicobar islands**.
- **Similarly, the T.N. Godavarman Thirumulpad judgment (1996)** extends legal protection to forests as per dictionary meaning — which should cover the remaining Aravali areas that are not notified as forest.
- **The Regional Plan-2021 for the National Capital Region also offers crucial protection, designating the Aravalis and forest areas as ‘Natural Conservation Zone’ and restricting the maximum construction limit to 0.5%.**

Source: [The Hindu](#)

GLOBAL WARMING EXACERBATING WATER GAPS

Context: Water gaps amounting to nearly 458 billion cubic meters per year already exist. These are projected to increase by 6 per cent under 1.5 degrees Celsius warming and by 15 per cent under 3 degrees Celsius warming according to a new analysis published in Nature Communications.

Background:

- The study emphasised on developing a more **resilient and sustainable water management system to combat scarcity**. This could include investing in resilient infrastructure, enhancing storage capabilities, desalination of seawater, reuse of treated wastewater and physical and virtual water transfers to distribute water from areas of abundance to areas of need.

Key takeaways

- Water gaps are defined as the difference between renewable water availability and water consumption while maintaining adequate flows in aquatic environments.
- Researchers used climate outputs from climate models to quantify water gaps under baseline, 1.5°C, and 3°C warming scenarios.
- Regions currently experiencing water gaps are expected to face more severe conditions under 1.5°C warming, with even worse outcomes at 3°C warming. **This trend is particularly evident in the eastern US, Chile, the Mediterranean region, south and east India, and the North China Plain.**
- Additionally, some regions that were relatively unaffected in the baseline climate, such as Italy, **Madagascar, and some US states on the East Coast (North Carolina and Virginia) and in the Great Lakes region (Wisconsin, Minnesota, Illinois), are projected to see worsening conditions.**
- Saudi Arabia is projected to experience decreased water scarcity under the 1.5°C warming scenario, but substantial increases in water gaps under the 3°C warming scenario.

Largest water gaps in India

- The largest water gaps under the baseline climate are found in India, the United States, Pakistan, Iran and China.
- India is projected to experience the most important increase in water gaps under warming scenarios. In a 1.5°C warmer climate, India will have an additional 11.1 km³/yr water gap.

Ganges-Brahmaputra basin imperilled

- The analysis also looked at water gap trends in major hydrological basins. Under baseline climate conditions, the largest water gaps are found in the **Ganges-Brahmaputra, Sabarmati, Tigris-Euphrates, Indus and Nile River basins.**
- **Under 1.5°C warming conditions**, water gaps are expected to increase the most in the Ganges-Brahmaputra, Godavari and Mississippi-Missouri river basins, while water gaps are expected to decrease in the Sabarmati, Columbia and northwestern United States and Nile basins.
- **In a 3°C warmer climate, the Ganges-Brahmaputra basin** still presents the largest water gap increase compared to baseline conditions, **followed by the Indus, Mississippi-Missouri, China Coast, Godavari and Tigris-Euphrates basins.**

Source: [Down To Earth](#)

SOIL HEALTH CARD SCHEME

Context: Soil Health Card Scheme completes 10 years.

Background: -

- The Soil Health Card Scheme was introduced by Prime Minister Shri Narendra Modi on 19th February, 2015 at Suratgarh, Rajasthan.

Key takeaways

- **The Soil Health Card (SHC) Scheme** is a flagship initiative aimed at promoting sustainable agriculture and enhancing farm productivity. The scheme provides farmers with detailed assessments of their soil's health, enabling them to make informed decisions regarding nutrient management and crop selection.

Key Objectives:

- **Assess Soil Health:** Provide farmers with comprehensive information on the nutrient status of their soil.
- **Promote Balanced Fertilization:** Encourage the judicious use of fertilizers based on specific soil requirements, thereby reducing input costs and preventing soil degradation.
- **Enhance Crop Productivity:** Improve crop yields by recommending appropriate soil amendments and cultivation practices.

Features of the Soil Health Card:

- **Parameters Analyzed:** Each SHC evaluates 12 soil parameters, including:
 - **Macronutrients:** Nitrogen (N), Phosphorus (P), Potassium (K), Sulfur (S)
 - **Micronutrients:** Zinc (Zn), Iron (Fe), Copper (Cu), Manganese (Mn), Boron (Bo)
 - **Other Indicators:** pH (acidity or alkalinity), Electrical Conductivity (EC), Organic Carbon

(OC)

- **Recommendations Provided:** Based on the analysis, the SHC offers tailored advice on:
 - Optimal fertilizer types and dosages
 - Necessary soil amendments
 - Suitable crop choices

Implementation and Technological Advancements:

- **Sample Collection:** Soil samples are typically collected twice a year, post-harvest of Rabi and Kharif crops, ensuring accurate assessments when fields are fallow.
- **The Guideline of Village Level Soil Testing Labs (VLSTLs)** was issued in June 2023. VLSTLs can be set up by individual entrepreneurs i.e. rural youth and community based entrepreneurs, including Self Help Groups (SHGs), Schools, Agriculture Universities etc.
- **Digital Integration:** In 2023, the SHC portal was revamped and integrated with Geographic Information System (GIS) technology. This enhancement allows for:
 - Geo-referencing of soil samples
 - Real-time access to soil health data
 - Generation of QR codes linking samples to test results
- **Mobile Application:** A robust SHC mobile app has been developed, featuring:
 - Automated location tagging during sample collection
 - User-friendly interfaces for farmers to access their soil health information
 - Graphical representations of soil data

Source: [PIB](#)

GLOBAL SEA ICE COVER

Context: Global sea ice cover reached a record low of 15.76 million sq km over the five days leading up to February 13, surpassing the previous low of 15.93 million sq km recorded in January-February 2023.

Background: -

- Sea ice refers to the free-floating ice in the polar regions. While it generally expands during the winter and melts in the summers, some sea ice remains year-round. Note that this is different from icebergs, glaciers, ice sheets, and ice shelves, which form on land.

Key takeaways

- Experts suggest that the 2025 low could be due to a combination of warm air, warm seas and winds breaking apart the ice.
- Antarctic sea ice is particularly vulnerable to ice-breaking winds. Unlike Arctic ice, it is surrounded by the ocean instead of continents and is thus more mobile, and also comparatively thinner. The situation has been made worse this year due to warmer air and warmer waters towards the end of the southern hemisphere summer (December to February).
- Higher air temperatures led to the melting of the edges of the **Antarctic ice sheet — also known**

as ice shelves — which extend over the ocean.

- In the Arctic, where winter lasts from November to February, sea ice remained low because of a delayed freezing around the Hudson Bay, a large saltwater body in northeastern Canada. The delay occurred as unusually warm oceans took a longer time to cool down.
- The region also witnessed some storms which broke apart ice around the Barents Sea, located off the northern coasts of Norway and Russia, and the Bering Sea, the stretch between Alaska and Russia.
- Higher than usual air temperatures in areas such as Svalbard, Norway, resulted in further loss of sea ice.

What dip means

- Less sea ice cover means that more water is getting exposed to the Sun and more heat (solar radiation) is getting absorbed, leading to a further rise in temperatures.
- Notably, sea ice keeps temperatures down in the polar regions, as its bright, white surface reflects more sunlight back to space than liquid water. The loss of sea ice cover could be one of the reasons why the polar regions are getting warmer at a faster rate than the rest of the world.

Source: [Indian Express](#)

COMPENSATORY AFFORESTATION

Context: A recent audit report by the Comptroller and Auditor General of India (CAG) on the functioning of the Compensatory Afforestation Fund Management and Planning Authority (CAMPA) in the 2019-2022 period has flagged that the funds allocated for compensatory afforestation were diverted for other activities by Uttarakhand's forest divisions.

Background: -

- As per CAMPA guidelines, after receiving funds, afforestation should be conducted within a year, or two growing seasons. However, the report flagged that in 37 cases, compensatory afforestation was executed after more than eight years of getting final clearance.

Key takeaways

- The simple principle that works in compensatory afforestation is that since forests are an important resource and render ecological services, they must not be destroyed. However, because of developmental requirements, forests are routinely cut, or, as it is said in official language, “diverted for non-forest purposes”.
- But since afforested land does not become a forest overnight, there is still a loss of the goods and services that the diverted forest would have provided in the interim period. These goods and services include timber, bamboo, fuelwood, carbon sequestration, soil conservation, water recharge, and seed dispersal.
- Afforested land is expected to take no less than 50 years to start delivering comparable goods and services. To compensate for the loss in the interim, the law requires that the **Net Present Value (NPV)** of the diverted forest is calculated for a period of 50 years, and recovered from the “user agency” that is “diverting” the forests.
- **“User agencies”**, which are often private parties, are not expected to undertake afforestation

work themselves. This work has to be done by the state government. But the entire expenditure to be incurred on creating this new 'forest', including purchase of land for the purpose, has to be borne by the user.

- Thus, if any user agency wants to divert forest land for non-forest purposes, it has to deposit money for compensatory afforestation as well as pay the NPV, besides a few other charges.
- **CAMPA** is set up to manage this money. The compensatory afforestation money and NPV are supposed to be collected from the user agency by the government of the state in which the project is located, and deposited with the central government. The money will eventually flow back to the state to be used for afforestation or related works.
- **The Compensatory Afforestation Fund Act 2016** created a national CAMPA at the central government level, and a state CAMPA in each state and UT. Similarly, a **National Compensatory Afforestation Fund (CAF)**, and one in each state and UT too are also constituted.
- The states deposit money collected from user agencies with the national CAF, to be eventually credited into state CAFs as per their entitlement. The states, however, receive only 90% of their share; the other 10% are held back to cover administrative expenses.

Source: [Indian Express](#)

CONVENTION ON BIOLOGICAL DIVERSITY (CBD)

Context: World leaders at **16th Conference of the Parties (COP16) to the Convention on Biological Diversity (CBD) in Rome** have reached a historic agreement on financing global conservation goals.

Background: -

- The conference, which had been paused in Cali, Colombia, in 2024, resumed in Rome on February 25, 2025, where officials finalised the agreement after intense negotiations.

Key takeaways

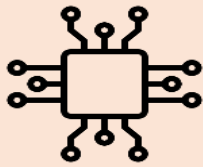
- **The Convention on Biological Diversity (CBD) is an international treaty** established to promote the conservation of biological diversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising from genetic resources.
- **The CBD was opened for signature at the Earth Summit in Rio de Janeiro in 1992** and entered into force on December 29, 1993.
- As of now, it has been ratified by 196 parties, including 195 countries and the European Union, making it one of the most widely adopted international environmental agreements.
- **The CBD has three main objectives, often referred to as the "three pillars" of the Convention:**
 - **Conservation of Biological Diversity:** To protect ecosystems, species, and genetic diversity from threats such as habitat destruction, pollution, climate change, and invasive species.
 - **Sustainable Use of Biological Resources:** To ensure that the use of biological resources (e.g., forests, fisheries, and wildlife) is sustainable and does not lead to their depletion or degradation.
 - **Fair and Equitable Sharing of Benefits Arising from Genetic Resources:** To ensure that the benefits derived from the use of genetic resources (e.g., for medicines, agriculture, or

biotechnology) are shared fairly and equitably with the countries and communities that provide these resources.

Supplementary Agreements under the CBD:

- **Cartagena Protocol on Biosafety (2003):** Focuses on the safe handling, transport, and use of **living modified organisms (LMOs)** resulting from modern biotechnology. It aims to protect biodiversity from potential risks posed by **genetically modified organisms (GMOs)**.
- **Post-2020 Global Biodiversity Framework (2022):** Adopted at the COP15 in Montreal, this framework sets ambitious targets for 2030 and 2050 to halt and reverse biodiversity loss. Key goals include protecting 30% of land and oceans, restoring degraded ecosystems, and mobilizing financial resources for biodiversity conservation.

Source: [Down To Earth](#)



SCIENCE & TECHNOLOGY



2024 YR4

Context: A newly discovered asteroid — called 2024 YR4 — has slightly more than 1% chance of crashing into Earth in 2032, National Aeronautics and Space Administration (NASA) said.

Background: -

- 2024 YR4 is big but not as big as the asteroid that wiped out dinosaurs and most other extant life some 66 million years ago. The 2024 YR4, however, can cause considerable localised damage in case it hits a populated area.

Key takeaways

- The 2024 YR4 was first discovered in December last year by a telescope in Chile. The near-Earth asteroid is as big as a football field. It came closest to Earth on Christmas Day — passing within roughly 800,000 kilometres of Earth.
- It will eventually fade from view over the next few months, and will not be visible again until it passes Earth's way again in 2028. Scientists are currently using some of the most powerful telescopes to determine 2024 YR4's path and size before it gets out of sight.
- To check how large an asteroid is, astronomers examine the brightness of the object — brighter objects are bigger. However, it is difficult to tell the exact measurements as the brightness depends on how reflective the asteroid's surface is (asteroids do not emit a light of their own, they only reflect sunlight).

How much destruction could the 2024 YR4 cause?

- Astronomers use the Torino Scale to categorise an object's destruction potential. 2024 YR4 is currently rated 3 on a scale from 0 to 10.
- The 2024 YR4 is expected to release 8 to 10 megatons of energy in case of a crash. The asteroid that hit Chelyabinsk, Russia, in 2013, released energy equivalent to about 500 kilotons of TNT — about 30 times more than the Hiroshima atomic bomb. That asteroid was around half the size of 2024 YR4.

How often do asteroids crash into Earth?

- Thousands of asteroids enter the Earth's atmosphere every day. Most are very small and burn up in the atmosphere due to friction.
- Large asteroids, which can cause global disasters, hit Earth much less often. Those bigger than a kilometre in diameter, such as the Chicxulub asteroid that sent the dinosaurs into extinction might hit in 260 million years.
- Smaller asteroids can also cause damage, like the one did in Chelyabinsk. It all depends on the asteroid's speed and angle of entry into Earth's atmosphere.
- Space agencies are working on planetary defence mechanisms that can prevent celestial bodies from colliding with Earth. For instance, the Double Asteroid Redirection Test (DART), a joint

project between NASA and the Johns Hopkins Applied Physics Laboratory, was the first planetary defence mission of NASA.

Source: [Indian Express](#)

NAVIGATION WITH INDIA CONSTELLATION (NAVIC)

Context: ISRO reported the partial failure of its NVS-02 navigation satellite due to the non-firing of its engines in space. This was the latest in a series of setbacks suffered by the **Indian Regional Navigation Satellite System (IRNSS)**, operationally referred to as the **Navigation with India Constellation (NavIC) system**.

Background: -

- The IRNSS was conceived in 1999 following the war in Kargil, during which India's military could not use the **American Global Positioning System (GPS) in the conflict zone**.

Key takeaways

- An indigenous seven-satellite constellation serving both defence and civilian needs was proposed to be put in place by 2016, and the first satellite, IRNSS 1A, was launched on July 1, 2013.
- Eleven years later, however, only five of the 11 satellites launched in the NavIC program – including replacements for failed satellites – are fully operational.
- **After IRNSS-1A in 2013, the IRNSS-1B, 1C, 1D, 1E, 1F, 1G, 1H, 1I, 1J, and 1K were launched between 2014 and January, 2025.**
- Following the launch of IRNSS-1G, the seventh in the series in 2016, ISRO had said that “the successful launch of the satellite signifies the completion of the IRNSS constellation.

What went wrong with the satellites?

- Mid-2016 onward, there were reports of failures of the rubidium atomic clocks used in several navigation satellites, including ISRO's IRNSS and the **European Space Agency's (ESA's) Galileo Global Navigation Satellite System (GNSS)**. There are three atomic clocks on each IRNSS satellite.
- **The engine failure on the IRNSS-1K (or NVS-02) launched last month, which has left it in a sub-optimal orbit around Earth, means that six of the 11 IRNSS satellites launched so far have been partial failures.**

Why is the IRNSS/ NavIC system important for India?

- **The NavIC satellites provide two types of services** – Standard Positioning Service which is for general and commercial use, and Restricted Service which is meant for the defence forces – over the Indian landmass and neighbouring regions.
- The system provides positioning data at all times with position accuracy better than 20 metres during all weather conditions, anywhere within India and a region extending about 1,500 km around India on dual frequencies in L5 and S band.
- **A primary reason to develop an indigenous system like the IRNSS despite the existence of global systems such as the GPS (US), GLONASS (Russia), Galileo (Europe), Beidou (China), and QZSS (Japan), is the reliability that it offers in defence use.**

- For NavIC to become ubiquitous in the Indian subcontinent, ISRO will have to sell its capabilities to general positioning service providers such as mobile phone and vehicle manufacturers, etc.

Source: [Indian Express](#)

CO2 BATTERY

Context: NTPC announced the launch of CO2 battery energy storage technology - a pioneering step towards sustainable and innovative energy solutions. This cutting-edge project is spearheaded by NETRA, the R&D wing of NTPC, in collaboration with M/s Triveni Turbine Limited and M/s Energy Dome, Italy.

Background: -

- A CO2 Battery with an energy capacity of 160 MWh will be set up at NTPC Kudgi. This initiative is a part of NTPC's broader strategy to diversify its energy portfolio and enhance renewable power generation.

Key takeaways

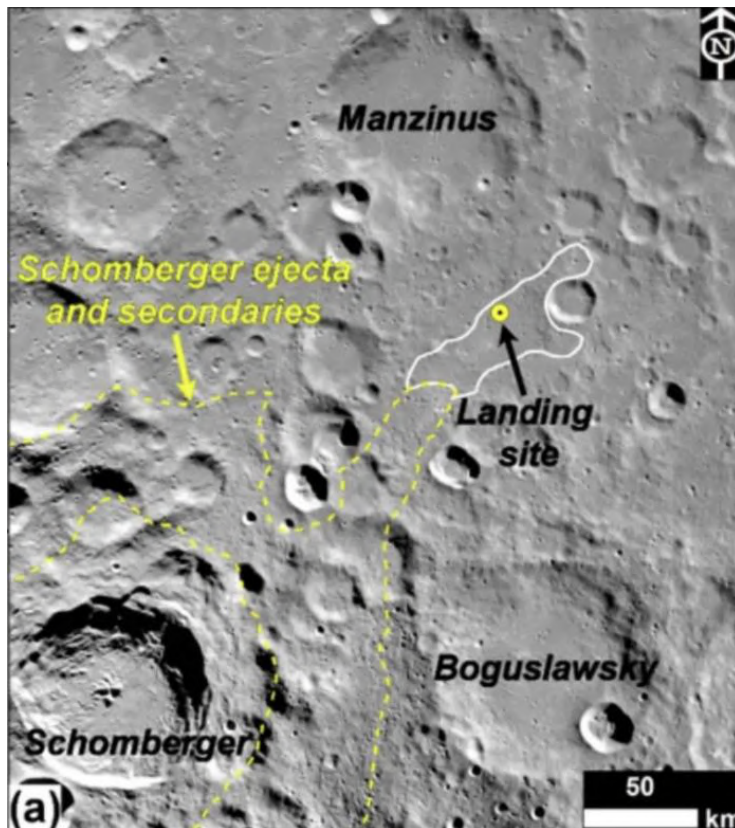
- A CO₂ battery is an innovative energy storage system that utilizes **carbon dioxide (CO₂)** to store and release electrical energy, offering an alternative to traditional lithium-ion batteries. This technology is particularly suited for long-duration energy storage, addressing the intermittency of renewable energy sources like wind and solar.
- **Unlike Battery Energy Storage Systems (BESS)**, which operate on electrochemistry, the CO₂ Battery is based on specialized electro-mechanical turbomachinery. It functions on a '**Closed Brayton Thermodynamic Cycle**' using **anhydrous CO₂ as the process fluid**. The charging and discharging of electricity occur by manipulating the physical parameters of CO₂ from vapor to liquid state and vice versa.
- **How CO₂ Batteries Work:**
 - **Energy Storage (Charging):**
 - CO₂ gas is compressed, which heats it to approximately 400°C.
 - The heated CO₂ is then cooled through a heat exchanger, allowing it to liquefy.
 - The liquid CO₂ is stored under pressure in specialized containers.
 - **Energy Release (Discharging):**
 - When electricity is needed, the stored liquid CO₂ is evaporated and passed through the heat exchanger, where it absorbs heat and reverts to a gaseous state.
 - The expanding CO₂ gas drives a turbine, generating electricity.
 - CO₂ is re-captured and reused, creating a closed-loop system.
 - This closed-loop system efficiently stores energy and can release it over extended periods, making it ideal for balancing supply and demand in power grids.
- **Advantages of CO₂ Batteries:**
 - **Cost-Effectiveness:** Utilizing readily available CO₂ and standard industrial components reduces costs compared to lithium-ion batteries.

- **Scalability:** The modular design allows for easy scaling to meet various energy storage needs.
- **Environmental Benefits:** By using CO₂ in a closed-loop system, these batteries minimize greenhouse gas emissions and offer a sustainable energy storage solution.
- No requirement for critical minerals like lithium and cobalt.

Source: [PIB](#)

SHIV SHAKTI POINT

Context: A study by scientists from the Indian Space Research Organisation (ISRO) has estimated that the region where Chandrayaan-3 landed on the Moon is approximately 3.7 billion years old—coinciding with the period when primitive microbial life first emerged on Earth.



Background: -

- India's Chandrayaan-3 mission achieved a historic milestone on August 23, 2023, as it landed on the Moon's south polar region, making India the fourth country to achieve a soft landing on the lunar surface and the first to reach the Moon's South Pole.

Key takeaways

- A team of scientists from **Isro's Physical Research Laboratory (PRL), Ahmedabad**, has performed morphological and topographic analysis within the Chandrayaan-3 landing site, now known as the Shiv Shakti point.

- With the help of data generated by the **Pragyan rover housed inside the Vikram lander onboard Chandrayaan-3**, Indian scientists have been uncovering new

interpretations and insights into the moon's evolution.

- The latest study described the regional geography around **the Shiv Shakti point**.
- The Chandrayaan-3 landing site is enclosed between multiple large-impact craters: Manzinus (diameter about 96 km, age about 3.9 billion years) to the north, Boguslawsky (diameter about 95 km, age about 4 billion years) to the southeast, and Schomberger (diameter about 86 km, age about 3.7 billion years) to the south.
- Over the years, images have helped lunar scientists globally to rebuild the history of Manzinus and Boguslawsky, with both craters appearing to have flat crater floors and subdued crater wall structures.
- Each of these craters is categorised as shallow, with Boguslawsky being hollower than Manzinus and Schomberger. What distinguishes the Schomberger crater is its depth and well-preserved

structures — including the central peak, wall terrains, raised crater rim, and steep crater walls — along with an ejecta blanket.

Source: [Indian Express](#)

EINSTEIN RING

Context:The European Space Agency's (ESA) Euclid space telescope has discovered a rare ring of light, known as an Einstein ring, around a galaxy nearly 590 million light-years away from Earth.

Background: -

- Photos, which were taken by Euclid in September 2023 but released recently, of the Einstein ring show a bright ball of light in the centre with a bright, cloudy ring around it.

Key takeaways

- An Einstein ring is a ring of light around a form of dark matter, galaxy or cluster of galaxies. It is essentially an example of gravitational lensing.
- **Gravitational lensing is a phenomenon** which occurs when a massive celestial body — such as a galaxy or cluster of galaxies — creates a gravitational field which distorts and amplifies the light from distant galaxies that are behind it but in the same line of sight. The body causing the light to curve is called a gravitational lens.
- **Einstein rings are named after Albert Einstein**, whose general theory of relativity predicted that light could bend and brighten around objects across the cosmos. The first Einstein ring was discovered in 1987, and since then, several more have been discovered.
- Einstein rings are not visible to the naked eye, and can be observed only through space telescopes such as Euclid.

Why do scientists study Einstein rings?

- These rings help scientists investigate dark matter, which has never been detected but is believed to make up 85% of the total matter in the universe.
- Dark matter does not interact with light, but it does have a gravitational effect. Gravitational lensing therefore is sensitive to the presence of this dark matter, allowing us to indirectly detect it.
- Moreover, Einstein rings enable scientists to learn about distant galaxies, which otherwise might not be visible. They can also provide information about the expansion of the universe as the space between the Earth and other galaxies — both in the foreground and the background — is stretching, according to NASA.

Source: [Indian Express](#)

EXPERIMENTAL ADVANCED SUPERCONDUCTING TOKAMAK (EAST)

Context:Recently, Chinese scientists reported that they were able to maintain a plasma at a temperature of 100 million degrees C for about 1,066 seconds in a nuclear fusion reactor called the **Experimental Advanced Superconducting Tokamak (EAST)**.

Background:

- Nuclear fission produces harmful radioactive waste whereas nuclear fusion doesn't. This is why

developing a nuclear fusion reactor has become an important technological goal for the world.

Challenges of nuclear fusion

The tritium problem

- The problem is the amount of energy required to start and sustain a fusion reaction.
- The lightest nucleus in nature is of hydrogen, consisting of a single proton. An isotope of hydrogen called deuterium has one proton and one neutron in its nucleus. The nucleus of another isotope called tritium has one proton and two neutrons.
- Deuterium-deuterium fusion requires a higher temperature to begin than deuterium-tritium fusion. This is because the extra neutron in the tritium nucleus helps overcome the repulsion of like-charges between the protons.
- The fusion of a deuterium and a tritium nucleus creates a non-radioactive helium-4 nucleus, a neutron, and 17.6 MeV of energy, which is significant.
- While deuterium is abundant in seawater, there are no natural deposits of tritium and it is very hard to produce. At present it is mostly created as a by-product in heavy-water fission reactors in Canada, India, and South Korea.

The temperature problem

- For two nuclei to fuse, two things need to happen: the like-charges in the nuclei (due to the protons) need to be overcome, then the particles need to come within around 1 femtometre (fm) of each other so they can bond with each other using the strong nuclear force.
- This force is the strongest fundamental force in nature and is responsible for keeping protons and neutrons together in the nuclei of atoms. But on the flip side, it only acts across very short distances. This is why the nuclei need to be heated to such high temperatures: to give them enough energy to overcome their repulsion and get so close to each other.
- There are different reactor designs to achieve nuclear fusion by meeting these conditions. One set of designs involves the use of a tokamak — a donut-shaped vessel where the nuclei are confined, like in a cage, and made to fuse.

Importance of EAST

- At present, EAST isn't producing electricity. It is yet to reach a milestone called ignition: meaning it doesn't produce enough heat for more fusion reactions to occur, a.k.a. become self-sustaining.
- EAST is a testbed reactor for ITER, an international megaproject in which six countries around the world, including India, and the European Union are working together to build a tokamak that will sustain nuclear fusion that releases more energy than that required to sustain the plasma.
- Crucially, EAST's successes are important for ITER's future because the latter has come under criticism for its delayed timelines and cost overruns. ITER has been called the most expensive science experiment in history.

Source: [The Hindu](#)

PROJECT WATERWORTH

Context: Meta announced its most ambitious subsea cable endeavour ever – Project Waterworth.

Background: -

- The project will be a multi-billion dollar, multi-year investment to strengthen the scale and reliability of the world's digital highways.

Key takeaways

- **Project Waterworth** is an ambitious initiative by Meta to build the world's longest undersea cable system, spanning over 50,000 kilometers—exceeding Earth's circumference.
- The initiative will bring industry-leading connectivity to the US, India, Brazil, South Africa, and other key regions.
- The cable would be the longest to date that uses a 24 fibre-pair system, giving it a higher capacity, and would help support its AI projects, according to Meta, which owns Facebook, Instagram and WhatsApp.
- Meta said it would lay its cable system up to 7,000 metres deep and use enhanced burial techniques in high-risk fault areas, such as shallow waters near the coast, to avoid damage from ship anchors and other hazards.
- **Project Waterworth**, by leveraging advanced machine learning models, aims to predict and mitigate potential disruptions, enhancing the resilience of subsea networks.

Source: [Indian Express](#)

INTERNATIONAL THERMONUCLEAR EXPERIMENTAL REACTOR (ITER)

Context: Prime Minister Narendra Modi, on his visit to France to attend an AI summit, also toured the ambitious **International Thermonuclear Experimental Reactor (ITER) in Cadarache**, accompanied by French President Emmanuel Macron.

Background: -

- Prime Minister Modi's visit to the ITER facility marks the first time that a Head of State or Head of Government has visited ITER.

Key takeaways

- ITER is an international collaborative project aimed at building the world's largest magnetic fusion device, designed to prove the feasibility of fusion as a large-scale and carbon-free source of energy.
- Presently, as many as 33 nations, including India, are collaborating on ITER project. Seven ITER members — China, India, European Union, Japan, Korea, Russia and United States — have been making joint efforts for decades to build and operate the ITER experimental device.
- ITER is currently under construction in the south of France. According to its current timeline, it is expected to begin deuterium-tritium fusion reactions by 2039, producing 500 MW of fusion power.
- ITER would not be converting the output heat energy into electricity. But its success is expected to pave the way for other machines to start using fusion energy as a regular source of electricity generation.
- According to the ITER website, the primary task of ITER is to investigate and demonstrate

burning plasmas — “plasmas in which the energy of the helium nuclei produced by the fusion reactions is enough to maintain the temperature of the plasma, thereby reducing or eliminating the need for external heating”.

Source: [Indian Express](#)

RESILIENT TELECOM INFRASTRUCTURE

Context: The Coalition for Disaster Resilient Infrastructure (CDRI), a multilateral organisation launched by Prime Minister Narendra Modi in 2019, put out a report earlier this month studying Indian telecom networks’ preparedness in the event of disasters.

Background: -

- Telecom networks are crucial to handling disasters, because they allow the State and National Disaster Management Authorities to communicate quickly with local municipalities and the State and Union governments

Key takeaways

- Telecom networks are particularly vulnerable, as they comprise cabling that may not be fully underground, towers that may not be able to withstand high wind speeds, and because they rely on a steady flow of electricity, which is frequently disrupted by disasters.
- Coastal regions face elevated risks, as that is where undersea cables connect India with the global internet. If the landing stations of these cables are impacted, there can be massive network disruptions.

What can be done?

- Since much of the disruption is attributable to power failures, much can be accomplished during a disaster by maintaining or restoring power supply to telecom towers and the network operating centres to which they’re connected.
- Telecom operators have typically never deployed towers assuming 24/7 power supply — and have battery as well as fuel backup.
- The CDRI report recommends a few measures to develop a resilient telecom network. These include greater data collection and more coordination among officials, a more robust power infrastructure, and requiring cell towers to withstand higher wind speeds, especially in districts where hurricanes make landfall.
- The CDRI also advocates for a dig-once policy, which recommends building as much underground civil infrastructure, like water and gas supply lines, drainage and fibre optic cables simultaneously, reducing the risk of cables being damaged when other infrastructure is built.
- The short- to medium-term roadmap suggests the need to update disaster damage and loss data format, mainstream disaster risk modelling into telecommunications infrastructure planning, strengthen telecommunications asset design based on local and regional hazard vulnerability profiles, the report says.
- There are also commercial interventions that the report touches on. A key one is parametric insurance, a system where telecom operators are not left to bear the commercial burden of a disaster all by themselves, and are thus financially incentivised to bring networks back online

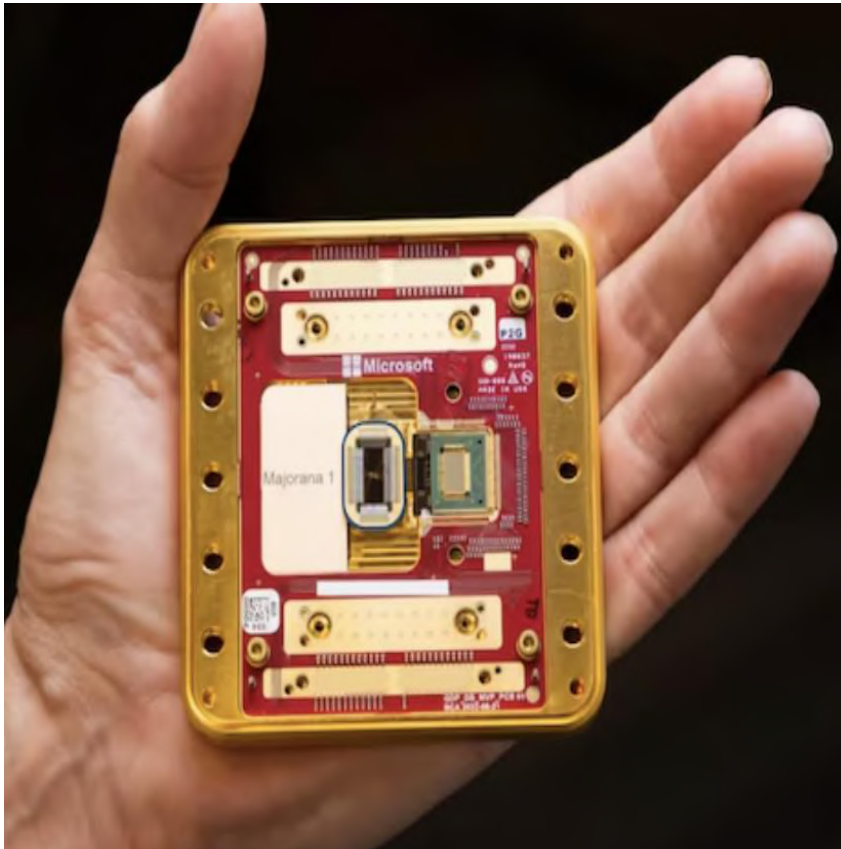
rapidly (and presumably to nudge them to disaster-proof their infrastructure well enough to keep premiums down).

Source: [The Hindu](#)

MAJORANA 1

Context: Microsoft has announced a new chip, called Majorana 1, that it said showed quantum computing is “years, not decades” away, joining Google and IBM in predicting that a fundamental change in computing technology is closer than believed.

Background: -



- Quantum computing holds the promise of carrying out calculations that would take today's systems millions of years and could unlock important discoveries in medicine, chemistry, and aerospace, among others.

Key takeaways

- **Majorana 1** is a groundbreaking quantum computing chip developed by Microsoft.
- Microsoft's breakthrough revolves around engineering a new type of particle known as Majorana. These Majorana particles have been fabricated using topological conductors and they exist in a topological state, which differs from traditional states of matter such

as solid, liquid, and gas.

- First theorised over 80 years ago by Italian physicist Ettore Majorana, Majorana fermions are particles that are their own anti-particles. But, there was no physical evidence of such particles.

Key Features

- **Topological Quantum Bits:** Majorana 1 integrates eight topological qubits, which are more stable and less prone to errors compared to traditional qubits.
- **Topological Conductors:** Utilizes a new type of material called topoconductors to observe and control Majorana particles, enhancing the reliability and scalability of qubits.
- **Compact Design:** The chip is compact, about the size of a sticky note, yet powerful enough to be a stepping stone towards systems capable of supporting a million qubits.

Applications

- **Industrial-Scale Problems:** Designed to solve meaningful, industrial-scale problems in fields such as medicine, pollution control, and materials science.

- **Future Potential:** Microsoft envisions Majorana 1 as a path to developing quantum systems that can scale to a million qubits, enabling transformative solutions.

Significance

- **Quantum Leap:** Represents a significant advancement in quantum computing, potentially revolutionizing various industries.
- **Error Resistance:** The use of Majorana fermions makes the chip highly stable and resistant to errors, a major challenge in quantum computing.

Source: [The Hindu](#)

SVALBARD GLOBAL SEED VAULT

Context: Over 14,000 new samples of food crop seeds are being added this week to a "doomsday" vault located on an island in Svalbard, Norway.

Background:

- These seeds are part of an effort launched in 2008 to back up thousands of the planet's essential plant species, ensuring a biodiverse future food supply.

Key takeaways

- The Svalbard Global Seed Vault (also known as the Doomsday Vault) is a secure seed bank located on the Svalbard archipelago, Norway. It serves as a global backup facility for preserving the genetic diversity of the world's crops, ensuring food security in case of natural or man-made disasters.
- Situated inside a mountain on Spitsbergen Island in the Arctic Circle (Norway).
- Chosen for its geopolitical stability, low seismic activity, and permafrost, which ensures natural preservation of seeds.
- The permafrost acts as a natural refrigerator, keeping the seeds viable for hundreds of years.
- **The Svalbard Global Seed Vault is owned by Norway and managed in partnership between the Norwegian Ministry of Agriculture and Food, the regional genebank NordGen and the Crop Trust.**
- **Purpose and Objectives -**
 - **To safeguard global food security in case of:**
 - Climate change
 - Natural disasters (earthquakes, floods, etc.)
 - War and conflicts
 - Biodiversity loss
 - To store duplicates of seeds from national, regional, and international gene banks.
 - To prevent the extinction of plant species essential for agriculture and food production.
- The vault can store 4.5 million seed samples, with a current storage of over 1.2 million seed varieties from over 100 countries.
- Seeds are stored in sealed three-layered foil packets inside temperature-controlled chambers at –

18°C.

Source: [IFLSCIENCE](#)

SPHEREX

Context: National Aeronautics and Space Administration (NASA) will launch its new megaphone-shaped space telescope SPHEREx on February 28 aboard a SpaceX Falcon 9 rocket from Vandenberg Space Force Base in California.

Background: -

- During its short two-year mission, the observatory will help better understand things about the formation of the universe, the growth of all galaxies across cosmic history, and the location of water and life-forming molecules in the Milky Way galaxy.

Key takeaways

- **SPHEREx** will map the universe while detecting two kinds of cosmic light, optical and infrared.
- While the human eye can see optical light, infrared light is invisible to it. Infrared light contains crucial data about distant space, star formation, and galactic structures.
- Scientists use specialised cameras and telescopes to study infrared which has a heat signature. One such is the James Webb Space Telescope (JWST) whose speciality is infrared observation.
- While JWST is great at observing highly localised regions of the universe, SPHEREx will image the entire sky as seen from Earth.

Understanding Cosmic Inflation:

- **SPHEREx** will measure cosmic inflation, a phase 14 billion years ago when the universe expanded faster than light for a fraction of a second.

Biogenic Molecules & Life Formation:

- **SPHEREx** will identify water and biogenic molecules (carbon, hydrogen, oxygen) in the Milky Way and nearby systems.
- These molecules, frozen in icy particles, exist in cold galactic regions but their journey to Earth remains unknown.
- The telescope will map these molecules, offering insights into their role in life formation.

Source: [Indian Express](#)



HISTORY AND ART & CULTURE



MURDER OF MAHATMA GANDHI

Context: On January 30, 1948, at exactly 5.17 pm, Nathuram Godse fired three shots at Mahatma Gandhi from his Beretta M1934. The Mahatma died on the spot.

Background: -

- During his trial, Godse tried to take sole responsibility for the crime. But his arguments were rejected.

Key takeaways

- A Bench of the Punjab High Court in Shimla in 1949 upheld the convictions and sentences of five people for the larger conspiracy: Godse, his younger brother Gopal, Narayan Apte, Vishnu Karkare, and Madanlal Pahwa.
- Apart from these five convicts, the other accused were Savarkar, Shankar Kistayya, and Dattatraya Parchure. Digambar Badge confessed to his role in the conspiracy and became an approver in return for a pardon.

The conspiracy

- **Godse and Apte** conceived of the plan to kill Gandhi in December 1947. The duo left Poona for Bombay on January 13. The same day, Badge, accompanied by his servant, Shankar Kistayya, also left for Bombay with a bag containing two gun-cotton slabs and four hand-grenades.
- Godse, Apte, and Badge were joined in Bombay by Pahwa and Karkare at the Hindu Mahasabha office, where the plan was chalked out. After some money was raised for the project — ostensibly to help Hindus in Hyderabad — Godse and Apte travelled to Delhi by plane. They stayed at the Marina hotel till January 20. The rest of the conspirators too arrived in Delhi by January 19.
- In the morning of January 20, Apte, Karkare, Badge and Shankar reconnoitered Birla House, where Gandhi was staying. The first attempt to kill Gandhi was made on January 20. The plan was to throw a grenade to disperse the crowd — and then throw another at Gandhi. However, Badge lost his courage and the second grenade was never thrown. Pahwa was arrested and interrogated by the police. The plan had failed.
- Subsequently, Godse decided to kill Gandhi himself. On January 30, as the Mahatma was on his way to give his evening sermon, Nathuram walked up to him and shot him dead. Apte was by his side. Godse was apprehended immediately, while Apte would be picked up from Bombay a few weeks later.
- Both Godse and Apte were hanged in 1949. The rest of the conspirators were handed prison sentences of varying lengths.

Source: [Indian Express](#)

DOKRA ARTWORK

Context: Prime Minister Narendra Modi has gifted Dokra artwork to French President Emmanuel Macron.

Background:

- Dhokra (also spelt Dokra) is non-ferrous metal casting using the lost-wax casting technique.

Key takeaways

- Dhokra Art is an ancient Indian metal casting tradition that has been practiced for over 4,000 years, dating back to the Indus Valley Civilization.
- This art form is renowned for its distinctive lost-wax casting technique, producing non-ferrous metal artifacts that are celebrated for their primitive simplicity, enchanting folk motifs, and robust forms.
- The term "**Dhokra**" is derived from the Dhokra Damar tribes, traditional metalsmiths of West Bengal and Odisha. Their craftsmanship traces back to the Indus Valley Civilization, with the famous "Dancing Girl" bronze statue from Mohenjo-Daro being a prime example of early lost-wax casting.
- **Geographical Spread:** Over centuries, Dhokra artisans migrated across India. Today, Dhokra art is practiced nationwide, with each region infusing its unique cultural nuances into the craft.

The Lost-Wax Casting Process:

- **Core Creation:** Artisans begin by shaping a core from clay, roughly outlining the desired artifact's form.
- **Wax Modeling:** This clay core is enveloped in a layer of beeswax, which is meticulously sculpted to incorporate intricate designs and details.
- **Mold Formation:** Multiple layers of fine clay are applied over the wax model to create a sturdy mold. Once dried, the assembly is heated, causing the wax to melt and drain away, leaving a hollow clay mold.
- **Metal Casting:** Molten metal, typically brass or bronze, is poured into the vacant mold cavity. After cooling, the clay mold is broken open to reveal the metal artifact, which is then polished and finished.

Cultural and Artistic Significance:

- **Product Range:** Dhokra artisans craft a diverse array of items, including figurines of deities, animals, and humans, as well as functional objects like lamps, jewelry, and utensils.
- **Design Aesthetics:** The art is characterized by its rustic charm, with motifs reflecting tribal folklore, nature, and daily life, often showcasing elongated forms and intricate patterns.

Source: [NDTV](#)

RAMAKRISHNA PARAMAHMSA

Context: February 18, 2025, marks the 189th birth anniversary of Ramakrishna Paramahansa, the revered 19th-century saint.

Background: -

- Born as Gadadhar Chattopadhyay on February 18, 1836, Sri Ramakrishna Paramahansa was one of the world's most significant religious figures.

Key takeaways

- Ramakrishna Paramahansa (1836–1886) was born in Kamarpukur, West Bengal.
- He underwent profound mystical experiences that led him to explore various religious practices, including Hinduism, Islam, and Christianity.
- **Priest at Dakshineswar Kali Temple:** At the age of 20, Ramakrishna became the priest of the Dakshineswar Kali Temple near Kolkata, where he began his intense spiritual practices.
- **Devotion to Goddess Kali:** He developed an intense devotion to Goddess Kali, whom he regarded as the Divine Mother. His spiritual practices often involved deep meditation and communion with the Divine.

Core Teachings and Impact:

- **Oneness of God:** Ramakrishna emphasized that all religions lead to the same ultimate truth, and God can be realized through any sincere spiritual path.
- **Divine Motherhood:** He often spoke of God as the Divine Mother, emphasizing love, compassion, and devotion.
- **Renunciation and Detachment:** He advocated for detachment from material desires and the importance of leading a simple, spiritual life.
- **Service to Humanity:** Ramakrishna believed that serving humanity is a form of worship, as God resides in all beings.
- **Harmony of Religions:** His famous saying, "As many faiths, so many paths," highlights his belief in the unity of all religions.
- **Spiritual Realization Over Rituals:** Emphasizing personal, direct experience of the divine, he challenged the orthodox practices of his time, advocating for a more experiential and inclusive spirituality.

Historical and Cultural Relevance:

- **Indian Renaissance:** His ideas contributed significantly to the 19th-century spiritual and cultural revival in India. By promoting the intrinsic value of Indian spiritual traditions, he played a role in countering the colonial narrative that often undermined indigenous culture.
- **Influence on Modern Thought:** His teachings laid the groundwork for later reforms in social and religious spheres. Most notably, his disciple Swami Vivekananda carried forward his message, establishing the Ramakrishna Mission and introducing Indian philosophy to the Western world.

Source: [News18](#)

JHUMUR DANCE

Context: Prime Minister Narendra Modi will witness what has been pegged as the “biggest ever” jhumur (also spelt jhumoir or jhumair) event in history on February 24.

Background: -

- Some 8,600 dancers will perform in Guwahati’s Sarusajai Stadium at the Jhumoir Binandini 2025 to mark the 200th anniversary of Assam’s tea industry.

Key takeaways

- The term “tea tribe” loosely refers to a multi-cultural, multi-ethnic community of tea garden workers and their descendants. These people came from Central India — mostly from present-day Jharkhand, Odisha, Chhattisgarh, and West Bengal — and settled in Assam in the 19th century to work in the British tea gardens.
- This migration was often forced, and even when it was not, it occurred in highly exploitative circumstances. Not only did migrants work under abysmal conditions at the tea gardens for very little pay, but they were also not free to leave.
- Today, the descendants of these people are concentrated in districts with a large concentration of tea estates, in Upper Assam and in the Barak Valley. They have Other Backward Classes (OBC) status in the state, although they have long been fighting for Scheduled Tribe (ST) status. Tribes such as the Munda or the Santhal, a part of the larger tea garden community in Assam, have ST status in the states where they originally came from.



what is the Jhumur dance?

- The tea garden community brought a motley collection of cultural practices from their homelands to Assam. Of particular note in this regard is the jhumur tradition.

- Jhumur is the folk dance of the Sadan ethnolinguistic group, who trace their origins to the Chotanagpur region. Today it occupies a central place in what are known as “tea garden festivals” or festivals celebrated by tea garden workers in Assam.

- Women are the main dancers and singers, while men play traditional instruments such as madal, dhol, or dhak (drums), cymbals, flutes, and shehnai. The attire worn varies from community to community, although red and white sarees are particularly popular among

women.

- Dancers stand shoulder-to-shoulder and move in coordinated patterns with precise footwork while singing couplets in their **native languages** — **Nagpuri, Khortha and Kurmali**. These have evolved in Assam to borrow heavily from Assamese.
- While set to upbeat tunes and lively rhythms, the subject of Jhumur songs in Assam, however, can often be grim.
- The tradition also acts as a means of social cohesion, more so given the history of displacement of the tea garden communities. It aided them in not only retaining aspects of their culture and identity but also in making sense of the world their ancestors found themselves in.

Source: [Indian Express](#)

ANCIENT INDIA'S CONTRIBUTION TO SCIENCE

Context: National Science Day is celebrated on February 28 to mark the contribution of Indian scientists to society's development. In 1986, the India Government designated this day to commemorate the announcement of the discovery of the "Raman Effect." CV Raman discovered the Raman effect on February 28, 1928, for which he was awarded the Nobel Prize in 1930.

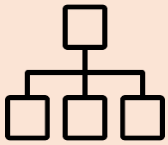
Background: -

- On the occasion of National Science Day, a look at the significant contribution of ancient India in the field of science is essential.

Key takeaways

- **The Indian origin of Zero:** In the 6th and 7th Century C.E. Indian mathematician Brahmagupta was the first to clearly define zero (as what remains when a number is subtracted from itself) and explore all its properties. He also invented negative numbers as a concept.
- **Decimal system of numerals:** Decimal system was discovered by Indians. Even the Arabs themselves called mathematics "the Indian (art)" (hindsat).
- **The atomic theory of Kanad:** The sixth-century scientist of Vaisheshika School, Kanad had given his atomic theory that the material universe is made up of kanas, (anu/atom) which cannot be seen through any human organ. These cannot be further subdivided. Thus, they are indivisible and indestructible. This is similar to the modern atomic theory.
- **Earthquake cloud theory:** Varahamihira in his book Brhat Samhita has devoted a chapter on signs of earthquakes. He has tried to relate earthquakes to the influence of planets, undersea activities, underground water, unusual cloud formation, and abnormal behaviour of animals.
- **Position of nine planets:** Aryabhata was the first mathematician who discovered the position of nine planets and mentioned that they revolve around the sun. The mathematician has made a huge contribution to the place value system.
- **Medicine:** Charak in his book Charak Samhita had given a description of a large number of diseases and gives methods of identifying their causes as well as the method of their treatment. He was the first who emphasise that digestion, metabolism, and immunity are important for health.
- **Metallurgy:** The Iron Pillar of Delhi stands as evidence of ancient India's advanced metallurgical knowledge, particularly in corrosion resistance. Wootz steel, primarily iron with a high proportion of carbon, is known for high durability and strength has originated in India.
- **Surgery:** Sushruta is often referred to as the "Father of Surgery". His works have immensely contributed to the field of surgery, especially cosmetic surgery. His work in the book "Sushruta Samhita" reflects his mastery of surgical techniques and human anatomy.
- **Yoga:** The Yoga Sutras of Patanjali has systematically presented the science of Yoga.

Source: [Indian Express](#)



GOVT. INITIATIVES, SCHEMES AND POLICIES, ORGANISATION



PM SURYA GHAR MUFT BIJLI YOJANA

Context: The Union Budget 2025 has increased the allocation for PM Surya Ghar Muft Bijli Yojana (SGMBY) scheme to ₹20,000 crore, a sharp rise from the ₹11,100 crore in the FY25 Revised Estimates (RE) and ₹6,250 crore in the FY25 Budget Estimates (BE).

Background:

- According to Nationally Determined Contribution (NDC) targets, India has committed to reducing the emission intensity of its GDP by 45 percent by 2030 from the 2005 level and achieving about 50 percent cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.

Key takeaways

- **The Pradhan Mantri Surya Ghar Muft Bijli Yojana (PMSG)** is a flagship initiative launched by the Government of India with the twin objectives of promoting renewable energy and ensuring affordable electricity access.
- The scheme aims to install rooftop solar systems in one crore residential households. This is expected to not only reduce household electricity bills (by providing up to 300 units of free electricity per month) but also help reduce the nation's carbon footprint.

Key Components of the Scheme

- Residential consumers are provided with a subsidy based on their system capacity. For example, for the first 2 kW of rooftop solar capacity, a subsidy of up to 60% (at benchmark costs) is available, while for the next 1 kW (i.e. capacity between 2 and 3 kW), the subsidy is capped at 40% of the additional cost. No subsidy is provided beyond 3 kW capacity.
- **Loan Facilities:** In addition to the subsidy, the scheme offers access to collateral-free, low-interest loans for eligible households to finance the installation of rooftop solar systems.
- **National Portal:** Applications are processed through a dedicated online portal, where households register using their consumer details and select from a network of government-registered vendors.
- **Vendor and DISCOM Coordination:** The implementation is carried out by registered vendors and coordinated at the state level by Distribution Companies (DISCOMs) or power departments, ensuring that installations meet the technical and quality benchmarks.
- **Model Solar Village Initiative:** To further promote renewable energy at the grassroots, the scheme includes establishing one Model Solar Village per district.

Who are eligible to apply for the Scheme?

- The applicant must be an Indian citizen.
- Must own a house with a roof that is suitable for installing solar panels.
- The household must have a valid electricity connection.

- The household must not have availed of any other subsidy for solar panels.

Source: [Moneycontrol](#)

PLAN TO AMEND NUCLEAR LIABILITY LAW

Context: Union government's announcement that it would amend the Civil Liability for Nuclear Damages Act (CLNDA), 2010, and the Atomic Energy Act, 1962, is likely to enthrone American and French nuclear power companies, whose projects have been deadlocked due to legal concerns for more than 15 years.

Background: -

- The announcement, which marked a sharp U-turn from the government's position in 2015, was made in the Budget speech on February 1.
- In particular, it is meant to help progress the Electricite de France (EDF) MoU to build six EPR1650 reactors at Jaitapur in Maharashtra that was signed in 2009 (with Areva), and American Westinghouse Electric Company's (WEC) MoU, signed in 2012, to build six AP1000 reactors at Kovvada in Andhra Pradesh.

Key takeaways

- Currently, India has a nuclear power capacity of 6,780 MW from 22 reactors, and the only foreign operator in India is Russia's Rosatom.
- The CLNDA has been the biggest impediment to private sector participation due to a provision that pins liabilities on nuclear suppliers in addition to the operator in case of nuclear damage.
- Western nuclear power companies says that clauses in the CLNDA are unacceptable as they mandate a high degree of liability for suppliers and contradict the international Convention for Supplementary Compensation for Nuclear Damage (CSC) which focuses only on the liability of operators of the plant.
- The clauses were inserted in 2012, where the then-in-Opposition NDA members had accused the government of letting Western companies off from liability, citing the Union Carbide-Bhopal gas leak case that killed thousands in 1984 and the Fukushima nuclear leak in Japan in 2011.
- Officials aware of discussions on the issue said that while the CLNDA would be amended to separate operator's liability from supplier's liability to bring it in line with the CSC, the Atomic Energy Act would liberalise investment in power projects in India.

Source: [The Hindu](#)

PRADHAN MANTRI ANUSUCHIT JAATI ABHYUDAY YOJANA (PM-AJAY)

Context: A meeting of the Central Advisory Committee (CAC) for the Pradhan Mantri Anusuchit Jaati Abhyuday Yojana (PM-AJAY) was held under the Chairmanship of Dr. Virendra Kumar, Union Minister of Social Justice and Empowerment and Chairperson of the CAC.

Background:

- Scheduled Castes (SCs), who constitute 16.6% of our population as per 2011 Census, have historically suffered social and educational disabilities and economic deprivation arising therefrom. Accordingly, special provisions have been enshrined for advancement of their interests.

Key takeaways

- The Pradhan Mantri Anusuchit Jaati Abhyuday Yojana (PM-AJAY) is a Centrally Sponsored Scheme

launched in the fiscal year 2021-22 by the **Ministry of Social Justice & Empowerment**. It was **established by merging three existing schemes**:

- Pradhan Mantri Adarsh Gram Yojana (PMAGY)
- Special Central Assistance to Scheduled Castes Sub Plan (SCA to SCSP)
- Babu Jagjivan Ram Chhatrawas Yojana (BJRCY)
- **Objectives:**
 - Reduce poverty of the SC communities by generation of additional employment opportunities through skill development, income generating schemes and other initiatives.
 - Improve socio-economic developmental indicators by ensuring adequate infrastructure and requisite services in the SC dominated villages.
 - Increase literacy and encourage enrolment of SCs in schools and higher educational institutions by providing adequate residential facilities in quality institutions, as well as residential schools where required, especially in the aspirational districts/ SC dominated blocks and elsewhere in India.

Key Components:

- **Development of SC-Dominated Villages into "Adarsh Gram":**
 - Transform villages with significant SC populations into model villages with access to basic services and infrastructure necessary for dignified living.
 - As of the latest data, a total of 29,881 villages have been covered under this component, with 6,087 declared as Adarsh Gram.
- **Grants-in-Aid to States/Districts:**
 - Provide financial assistance for projects aimed at socio-economic betterment of SC communities, including comprehensive livelihood projects and infrastructure development.
 - Central assistance of ₹3,242.07 crore has been released, benefiting 850,611 individuals.
- **Construction/Repair of Hostels:**
 - Build and repair hostels to support SC students, particularly those from rural and remote areas, in accessing quality education.
 - Since 2021-22, 46 hostels have been sanctioned for 5,185 beneficiaries, with an allocation of ₹126.30 crore.
- The scheme is 100% funded by the Central Government. However, the States/UTs are free to provide additional funds from their own resources if they so desire.

Source: [PIB](#)

FOR SECOND YEAR, NO DEATH PENALTY PASSES SC TEST

Context: Reflecting a divergence in decision-making on death penalty at different levels in the judiciary, the Supreme Court — for the second consecutive year — did not confirm a single death sentence in 2024 while trial courts awarded 139 such verdicts, according to a report by Project 39A, a criminal justice programme at the National Law University Delhi.

Background: -

- The SC heard six appeals in 2024 — it commuted five death sentences to life imprisonment while one was acquitted.

Key takeaways

- ‘**Death Penalty in India: Annual Statistics Report 2024**’, states that at the end of 2024, there were 564 death row prisoners in jails across India, the highest number since 2000.
- In 2024, of the 139 death sentences awarded by trial courts, 87 (62%) were imposed in murder cases and 35 (25%) in cases of murder involving sexual offences. This is a reversal from the previous year, when more death sentences were imposed in cases of murder involving sexual offences (59) than in simple murder cases (40).
- The total number of death row prisoners (564 in 2024) has risen every year since 2019, when there were 378 inmates on death row. In 2024, 17 women were on death row.
- The report attributes the high number of death row convicts to a trend of “high imposition of death sentences at trial courts, and the low rates of death penalty appeal disposals at High Courts”.
- Under Section 366 of the Criminal Procedure Code, 1973, and Section 407 of the Bharatiya Nyaya Suraksha Sanhita, 2023, death sentence proceedings must be forwarded to the High Court for confirmation before they can be executed.

Source: [Indian Express](#)

PM YUVA SCHEME

Context: Union Minister for Education, Shri Dharmendra Pradhan, launched 41 new books under the PM YUVA 2.0 scheme at the New Delhi World Book Fair 2025 today.

Background: -

- **The Pradhan Mantri YUVA (Young, Upcoming and Versatile Authors) Scheme** is an initiative by the Indian government aimed at nurturing young literary talent.

Key takeaways

- Launched on May 29, 2021, by the **Ministry of Education**, **PM YUVA** is designed to mentor young authors below the age of 30. The scheme aims to cultivate a new generation of writers who can contribute to the literary landscape of India.
- **The primary objectives of PM YUVA include:**
 - **Mentorship:** Providing guidance and support to young authors through experienced mentors.
 - **Literary Development:** Encouraging the creation of high-quality literary works in Indian languages.
 - **Cultural Promotion:** Highlighting Indian culture, heritage, history, and languages through literature.
 - **Global Reach:** Expanding the reach of Indian literature to a global audience.

Key Features

- **Selection Process:**
 - An all-India contest is conducted to select 75 young authors.
 - Participants submit a manuscript based on a specified theme.
 - A committee constituted by the National Book Trust (NBT) evaluates the submissions.
- **Mentorship and Scholarship:**
 - Selected authors receive guidance from established mentors to develop their manuscripts into full-fledged books.
 - A consolidated scholarship of ₹50,000 per month is provided for six months to each author.
- **Publication and Royalty:**
 - The developed manuscripts are published by the NBT.
 - Authors receive a 10% royalty on the published books.
- **Themes:**
 - **First Edition (2021):** Focused on the "National Movement of India," highlighting unsung heroes and lesser-known aspects of India's freedom struggle.
 - **Second Edition (2022):** Centered on "Democracy (Institutions, Events, People, and Constitutional Values)," aiming to develop writers who can explore various facets of democracy in India.

Source: [PIB](#)

NARI ADALATS

Context: The government has written to states inviting proposals to establish 'Nari Adalats', Women and Child Development Minister Annpurna Devi said.

Background:

- The ministry intends to extend the scheme, already running on a pilot basis in Assam and J&K, to other states.

Key takeaways

- Nari Adalats are women-led alternative dispute resolution forums established under the "Sambal" sub-scheme of Mission Shakti by the Ministry of Women and Child Development.
- These forums aim to provide women with an accessible grievance redressal mechanism at the gram panchayat level, addressing cases of petty nature such as harassment, subversion, or curtailment of rights.

Key Features:

- **Structure:** Each Nari Adalat comprises 7 to 11 members, known as 'Nyaya Sakhis,' who are nominated by the gram panchayat.
- **Functioning:** These forums resolve disputes through negotiation, mediation, and reconciliation, ensuring speedy, accessible, and affordable justice for women.

- **Implementation:** Initially launched on a pilot basis in 2023 in 50 gram panchayats each in Assam and Jammu & Kashmir, the program has seen success, prompting the Ministry to invite proposals from other states and Union Territories for expansion.

Source: [Indian Express](#)

OBSCENITY

Context: Ranveer Allahbadia, a popular content creator has become the subject of a Mumbai police probe over obscene comments made during a comedy show.

Background: -

- Mumbai police is yet to register an FIR, but the Assam cops have registered a complaint against Allahbadia and others including charges of 'obscene acts' under Section 296 of the Bharatiya Nyaya Sanhita, 2023 (BNS).

Key takeaways

- **Article 19(1)(a):** Guarantees the Right to Freedom of Speech and Expression.
- **Article 19(2):** Imposes reasonable restrictions on free speech in the interest of public decency and morality, allowing for laws against obscenity.
- **Section 294 of the Bharatiya Nyaya Sanhita** criminalises the creation and sale of obscene materials, including electronic content. It defines obscenity as material that is 'lascivious or appeals to the prurient interest'—content that is overtly and excessively sexual—or that has the potential to 'deprave and corrupt' those who consume it. First-time offenders face up to two years of imprisonment and a fine of up to ₹5,000.

History of obscenity rulings in India

- The most important ruling on obscenity laws involved *Lady Chatterley's Lover* -- a book by D H Lawrence, which was considered scandalous for its times due to its depictions of sexual encounters. It faced trials in India and the United Kingdom.
- In 1964, the Supreme Court of India held the book as obscene under Section 292 of the now-overhauled Indian Penal Code (IPC). The top court borrowed from the British case of *Queen v. Hicklin* (1868) -- at which point their legal system adopted the 'Hicklin test' to determine if something was obscene or not.
- The court held the work to be obscene if it had the tendency to "deprave and corrupt those whose minds are open to such immoral influences."
- However, the standard for obscenity had changed in the west before the SC pronounced this judgement and the Obscene Publications Act 1959 of UK said that a work must be considered 'as a whole' before its likely effect on audiences is mulled upon.
- This case would go on to influence the Indian Supreme Court to adopt 'community standards' test to gauge obscenity, as seen in *Aveek Sarkar v State of West Bengal* (2014).
- The court quashed obscenity proceedings against magazines which carried a photo of Boris Becker -- the tennis player -- in the nude with his fiancée. The SC held that applying the Hicklin test would result in the work being judged for "obscenity based on isolated passages of a work considered out of context and judged by their apparent influence on most susceptible readers, such as

children or weak-minded adults."

Source: [Deccan Herald](#)

PRADHAN MANTRI ANNADATA AAY SANRAKSHAN ABHIYAN (PM-AASHA) SCHEME

Context: The Government of India approved the continuation of the integrated **Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) Scheme** during the 15th Finance Commission Cycle up to 2025-26.

Background: -

- The scheme aims to strengthen the procurement mechanism in coordination with state governments, thereby safeguarding farmers' income and stabilizing the agricultural market.

Key takeaways

- The Pradhan Mantri Annadata Aay Sanrakshan Abhiyan (PM-AASHA) is an umbrella scheme launched by the Government of India in 2018 to ensure remunerative prices for farmers' produce.

Key Components of PM-AASHA:-

Price Support Scheme (PSS):

- **Objective:** Procurement of notified pulses, oilseeds, and copra directly from farmers at Minimum Support Prices (MSP) when market prices fall below MSP.
- **Implementation:** Central Nodal Agencies (CNAs) like the National Agricultural Cooperative Marketing Federation of India (NAFED) undertake procurement in collaboration with state-level agencies.
- **Procurement Limit:** From the 2024-25 season onwards, procurement is set at 25% of the national production for the notified crops. However, for Tur (Arhar), Urad, and Masur, 100% procurement is allowed for the 2024-25 season to encourage domestic production and reduce import dependence.

Price Deficiency Payment Scheme (PDPS):

- **Objective:** To compensate farmers for the difference between the MSP and the actual selling price of oilseeds, without physical procurement.
- **Implementation:** Farmers receive direct payments of the price difference, with the central government bearing up to 15% of the MSP as compensation.
- **Coverage Expansion:** The scheme's coverage has been enhanced from 25% to 40% of the state's oilseed production, and the implementation period extended from 3 to 4 months to benefit more farmers.

Pilot of Private Procurement & Stockist Scheme (PPPS):

- **Objective:** To involve the private sector in the procurement of oilseeds on a pilot basis in selected districts.
- **Implementation:** Private agencies procure oilseeds at MSP in designated markets during the notified period, aiming to increase efficiency and reduce the burden on public procurement systems.

Source: [PIB](#)

PRIME MINISTER INTERNSHIP SCHEME

Context: The Prime Minister Internship Scheme (PMIS) is once again open for applications with the launch of round 2 of the pilot phase.

Background: -

- After more than six lakh applications in round 1, round 2 offers more than one lakh internship opportunities in top companies across more than 730 districts in India.

Key takeaways

- The Prime Minister Internship Scheme (PMIS) is a significant initiative by the Government of India, aiming to provide 12-month paid internships to the nation's youth in the country's top companies.
- This program seeks to bridge the gap between academic learning and practical industry experience, thereby enhancing employability and skill development among young individuals.

Key Features of PMIS:

- **Target Group:** Individuals aged 21 to 24 who are not currently enrolled in any full-time academic program or employment.
- **Internship Duration:** 12 months, combining relevant training with at least six months of professional experience.
- **Financial Assistance:** Each intern receives a monthly stipend of ₹5,000, supplemented by a one-time financial assistance of ₹6,000.
- **Sectors Covered:** Internships are available across various sectors, including Oil, Gas & Energy; Banking & Financial Services; Travel & Hospitality; Automotive; Metals & Mining; Manufacturing & Industrial; and Fast-Moving Consumer Goods (FMCG).

Eligibility Criteria:



- Age: 21 to 24 years.

• **Educational Background:** Applicants should have completed their education and not be engaged in any full-time academic or employment activities.

• **Minimum qualification:** 10th, 12th grade, or an undergraduate degree, ITI, or other technical diploma

• **Exclusions:** Individuals enrolled in full-time studies or employment are not eligible.

Implementation and Outreach:

• The scheme is spearheaded by the Ministry of Corporate Affairs.

• To maximize reach, more than 70 Information, Education, and Communication (IEC) events are being

conducted across India, targeting districts with the highest number of internship opportunities.

Source: [Economic Times](https://www.economic-times.com)

NATIONAL EDUCATION POLICY (NEP) OF 2020

Context: Union Education Minister Dharmendra Pradhan's remarks indicating that Tamil Nadu would not receive funding under the Samagra Shiksha program until it adopts the National Education Policy (NEP) and implements its three-language policy has sparked significant protest against NEP in the state.

Background: -

- The need for an education policy was first felt in 1964 when Congress MP Siddheshwar Prasad criticised the then government for lacking vision for education. A 17-member Education Commission, headed by then UGC Chairperson D S Kothari, was constituted to draft a national policy. Based on the suggestions of this Commission, Parliament passed the first education policy in 1968.

Key takeaways

- The National Education Policy, 2020 is the third national education policy. The first came in 1968 and the second in 1986, under Indira Gandhi and Rajiv Gandhi respectively; the NEP of 1986 was revised in 1992 when P V Narasimha Rao was Prime Minister.
- The NEP only provides a broad direction and is not mandatory to follow. Education is a concurrent subject (both the Centre and the state governments can make laws on it).

Salient Features of NEP 2020

School Education Reforms

- **New 5+3+3+4 Structure replacing the 10+2 system:**
 - Foundational Stage (5 years): 3 years of preschool + Grades 1-2 (Ages 3-8).
 - Preparatory Stage (3 years): Grades 3-5 (Ages 8-11).
 - Middle Stage (3 years): Grades 6-8 (Ages 11-14).
 - Secondary Stage (4 years): Grades 9-12 (Ages 14-18).
- **Early Childhood Care and Education (ECCE):** Universal access to quality education for kids aged 3-6, integrating anganwadis and pre-schools into the system.
- **Mother Tongue as Medium of Instruction:** Up to Grade 5, preferably till Grade 8 and beyond.
- Introduction of Coding & Computational Thinking from Grade 6.

Higher Education Reforms

- Multidisciplinary Education with flexible curricula.
- Multiple Entry and Exit Options: Certificate after 1 year, Diploma after 2 years, Degree after 3/4 years.
- Abolition of M.Phil. Programs.
- Academic Bank of Credits (ABC): Digital credit storage and transfer system.
- Focus on Research: Formation of National Research Foundation (NRF).
- Higher Education Commission of India (HECI): Single regulatory body for all higher education (excluding medical and legal).

Skill Development & Vocational Education

- Vocational courses integrated from Grade 6.

- Focus on experiential learning, internships, and hands-on projects.
- By 2030, the minimum qualification for teaching to be a 4-year integrated B.Ed. degree.
- Increased Budget Allocation - Public investment in education to increase to 6% of GDP.

Source: [Indian Express](#)

NAKSHA SCHEME

Context: Recently, Union Rural Development Minister Shivraj Singh Chouhan launched the Central government's new initiative—'NAtional geospatial Knowledge-based land Survey of urban HABitations' (NAKSHA).

Background: -

- Most urban areas – barring a few states like Tamil Nadu, Maharashtra, Gujarat and Goa – have outdated or unstructured land records, causing inefficiencies in governance and taxation.
- The programme addresses the issue of updation of land records in urban areas – while land records have improved in rural areas, several cities lack maps even today.

Key takeaways

- NAKSHA is a city survey initiative under the existing **Digital India Land Records Modernization Programme (DILRMP)**. It is spearheaded by the **Department of Land Resources (DoLR)**, under the Ministry of Rural Development.
- Under the new initiative, maps of towns and cities will be prepared. The programme has been launched as a pilot across 152 urban local bodies in 26 states. The cities selected meet two criteria: area less than 35 sq km, and population less than 2 lakhs. The pilot will be completed in a year.
- According to the DoLR, "The NAKSHA program aims to create a comprehensive and accurate geospatial database for urban land records. By integrating aerial and field surveys with advanced GIS technology, the program enhances efficiency in land governance, streamlines property ownership records, and facilitates urban planning. Accurate geospatial data ensures improved decision-making, efficient land use planning and smoothen and certain property transactions."

What does NAKSHA entail?

- As per the Census 2011, India has 7,933 towns covering 1.02 lakh square km of the total 32.87 lakh square km geographical area of the country. NAKSHA will cover 4,142.63 square km of area.
- The initiative is 100 per cent centrally funded. The pilot project is expected to cost about Rs 194 crore.
- Once completed, NAKSHA is expected to provide comprehensive digital urban land records, reduce land disputes, aid in faster and more efficient urban planning, improve property tax collection, simplify property transactions and improve access to credit.
- The Centre plans to scale up NAKSHA once the pilot is completed.

How will the survey be done?

- The survey will be done through aerial photography using two types of cameras— simple cameras and oblique angle cameras (having 5 cameras) with LiDAR sensors. These cameras will be mounted on drones. The ground resolution of these cameras will be 5 cm, which is far better than

any satellite.

- The NAKSHA initiative envisages a three-stage process for the survey and mapping of urban areas.
- In the first stage, an area is selected, and a flight plan for a drone survey is drawn. Once a drone flight takes place, photographs are taken from which data will be extracted.
- In the second stage, a field survey is done to verify the conditions on the ground. Details like property tax, ownership, and registration deeds will be linked with each land parcel and property. Thereafter 2D/3D models will be prepared and draft land ownership details will be published.
- In the third stage, claims and objections are accounted for and grievances are redressed. Following these, the final maps will be published.

Source: [Indian Express](#)

PRADHAN PATI/SARPANCH PATI/MUKHIYA PATI

Context: A panel constituted by the Ministry of Panchayati Raj (MoPR) has recommended “exemplary penalties” for proven cases of proxy leadership as a measure to curb the practice of ‘Pradhan Pati’, ‘Sarpanch Pati’ or ‘Mukhiya Pati’ in Gram Panchayats across the country.

Background:

- India has about 2.63 lakh panchayats in all three tiers – Gram Panchayat (at village level), Panchayat Samiti (at block level) and Zila Parishad (at district level) – with 32.29 lakh elected representatives, of which 15.03 lakh (46.6 per cent) are women.
- While the ratio of Women Elected Representatives (WERs) in panchayats have increased, their effective participation in the decision-making process is low.

Key takeaways

- The report titled ‘Transforming Women’s Representation and Roles in Panchayati Raj Systems and Institutions: Eliminating Efforts for Proxy Participation’ has recommended a slew of measures to end proxy leadership.
- Initiatives such as gender-exclusive quotas in panchayat subject committees and ward-level committees (like Kerala); an annual award for Anti-Pradhan Pati champions; appointing women’s ombudspersons; public swearing-in of women pradhans; creating federation of women panchayat leaders; and setting up gender resource centres for leadership training, legal advice, and support networks are recommended.
- The committee also suggested technological solutions like virtual reality simulation training, integrating AI-powered query-driven replies to provide real-time legal and governance guidance to WERs in vernacular languages, creating WhatsApp groups of WERs linked with panchayat and block officials to help resolve day-to-day problems, and using the ministry’s Panchayat Nirnay Portal to allow citizens to track elected pradhans’ participation in meetings and decisions.
- It also suggested accountability and oversight mechanisms, which include helplines and women watchdog committees for confidential complaints about proxy leadership, with whistleblower rewards in verified cases.

Source: [Indian Express](#)

AGRICULTURE

MAKHANA

Context: Union Finance Minister, while presenting the Union Budget, said that a “Makhana Board” will be set up in Bihar to boost the cultivation and marketing of fox nuts.

Background: -

- Bihar accounts for approximately 90% of India’s makhana production. This production is primarily concentrated in northern and eastern Bihar.

Key takeaways

- Makhana (fox nut), is the dried edible seed of the prickly water lily or gorgon plant (*Euryale ferox*). This plant is found in freshwater ponds throughout South and East Asia. It is recognized for its violet and white flowers, as well as its large, round, and prickly leaves, which can often exceed a meter in diameter.
- The edible part of the Makhana plant consists of small, round seeds that have an outer layer ranging from black to brown. This has led to it being referred to as the ‘Black Diamond.’
- After processing, these seeds are often consumed as popped snacks known as ‘lava.’ Makhana is highly nutritious and provides an excellent source of carbohydrates, protein, and minerals. Due to its versatile applications in medicine, healthcare, and nutrition, this plant can be consumed in various forms.
- In 2022, ‘Mithila Makhana’ was conferred a Geographical Indication tag.
- In addition to Bihar, makhana is cultivated in smaller quantities in the states of Assam, Manipur, West Bengal, Tripura, and Odisha, as well as in neighboring countries like Nepal, Bangladesh, China, Japan, and Korea.

Climatic Conditions for Cultivation

- **Makhana (Gorgon Nut or Foxnut)** is an aquatic crop and is mainly grown in tropical and subtropical regions. It is traditionally cultivated in stagnant water bodies such as ponds, land depressions, lakes, ditches, or wetlands with shallow water depths of up to 4-6 feet.
- For optimal growth and development, Makhana requires a temperature range of 20-35°C, relative humidity of 50-90%, and annual rainfall between 100-250 cm.

Source: [Indian Express](#)

AATMANIRBHARTA IN PULSES

Context: Finance Minister has announced the launch of a six-year ‘Mission for Aatmanirbharta (self-reliance) in Pulses’ with a special focus on tur/arhar (pigeonpea), urad (black gram) and masoor (red lentil). Budget has allocated Rs 1,000 crore towards this scheme, which aims to provide minimum support price (MSP)-based procurement and post-harvest warehousing solutions in respect of the three pulses crops.

Background: -

- India’s pulses imports during April-November 2024 were valued at \$3.28 billion, 56.6% higher

than the \$2.09 billion for the corresponding period of 2023.

Key takeaways

- Domestic pulses production, as per the Agriculture Ministry's data, increased from 192.55 lt (lakh tonnes) in 2013-14 to 273.02 lt in 2021-22 and 260.58 lt in 2022-23.
- This was mainly courtesy two crops: chana and moong (green gram). That, in turn, was enabled by the development of short-duration varieties.
- Traditional chana varieties take 140-150 days to grow from seed to grain, while requiring 1-2 irrigations. The newer varieties can be harvested in 100-120 days, with farmers having to give a single irrigation. They can sow from end-September to mid-October, after harvesting of the kharif (post-monsoon) crop and using the residual moisture left by it in the soil.
- The breeding breakthroughs is greater in moong, where farmers today take as many as four crops. The first one is during kharif, second is during rabi (winter), third is grown in spring (February-March sowing) and the last one over summer (after April 1-20 sowing). The summer and rabi moong crops mature in 50-60 days, while it is slightly longer (65-75 days) for the kharif and spring varieties.
- In moong, Indian scientists have bred varieties that are not just short-duration, but also photo-thermo insensitive: Being non-sensitive to temperature or photoperiod (the length of time in a 24-hour period that plants are exposed to light), they can practically be grown anytime and anywhere.

The challenge

- There are growing limitations, particularly in tur/arhar, which was traditionally a 250-270 days crop yielding around 20 quintals/hectare. Breeders brought the duration down to 150-180 days with 15-16 quintals/hectare yields, but that's still long and low. As a result, tur/arhar is confined largely to the rainfed Marathwada-Vidarbha regions of Maharashtra and northern Karnataka, where farmers have fewer alternative cropping options.
- Aatmanirbharta in tur/arhar would, perhaps, require development of hybrids maturing within 140-150 days, giving 18-20 quintals/hectare yields and also amenable to mechanical harvesting.
- The second factor has to do with policy ambiguity. The Modi government wants farmers to expand pulses acreages and plant these nitrogen-fixing leguminous crops, instead of the more water-guzzling cereals or sugarcane. But tur/arhar is now wholesaling at prices lesser than its MSP.
- Moreover, the Centre, on January 20, allowed duty-free imports of tur/arhar for an additional year up to March 31, 2026. Imports of most other pulses – matar, masoor, urad and desi (small-sized) chana – are also attracting zero duty.

Source: [Indian Express](#)

HEALTH AND MEDICINE

SUZETRIGNE

Context:The US Food and Drug Administration approved a new type of non-opioid painkiller. Although expensive, the medicine is not addictive, unlike commonly used opioid painkillers. The drug, suzetrigine, will be sold under the brand name Journavx, and manufactured by US-based Vertex Pharmaceuticals.

Background: -

- The number of opioid overdoses has increased in recent years in several countries, in part due to the increased availability of opioids used in the management of chronic pain, and also due to increasing use of highly potent opioids appearing on the illicit drug market.

Key takeaways

What are opioids?

- Opioids are a class of drugs that “derive from, or mimic, natural substances found in the opium poppy plant”. Some common opioids include oxycodone, morphine, codeine, heroin, and fentanyl.
- Prescription opioids are primarily used for pain relief. They do so by getting attached to opioid receptors in the brain cells to release signals that block the perception of pain, and boost the feelings of pleasure or euphoria.
- Although opioids have several benefits and are extremely effective as painkillers, they can be quite addictive.

How does suzetrigine work?

- Pain is essentially a signal from one’s body to the brain that something potentially harmful has happened or is happening to the body. It is meant to prompt a reaction where one avoids further damage.
- Several body parts are involved in the sensation of pain. First are specialised nerve endings or ‘nociceptors’ which are widely distributed across the body. Any tissue damage activates these receptors which send electrical signals through the spinal cord to the brain, which then interprets these as pain.
- Unlike opioids, which numb the sensation of pain in the brain, suzetrigine works by targeting pain signals before they reach the brain. Since suzetrigine does not produce any sensation of pleasure or euphoria, experts believe that the drug could not create addiction or dependence.

Source: [Indian Express](#)

GARBHINI-DRISHTI

Context:India's commitment to cutting-edge biomedical research and innovation took a significant leap forward with the launch of the GARBH-INI-DRISHTI data repository.

Background: -

- It is part of the GARBH-INi program, which stands for Interdisciplinary Group for Advanced Research on Birth Outcomes – DBT India Initiative. This initiative is led by the Translational Health

Science and Technology Institute (THSTI) in collaboration with the Department of Biotechnology (DBT), Government of India.

Key takeaways

- **Garbhini-Drishti** is a comprehensive data dashboard that provides an extensive overview of one of South Asia's largest pregnancy cohort datasets.
- **Data Collection:** The platform collects clinical, epidemiological, imaging, and biospecimen data from over 12,000 pregnant women, newborns, and postpartum mothers. This data is collected at multiple time points throughout pregnancy and the postpartum period.
- **Research Focus:** The primary aim is to improve maternal and neonatal health outcomes by enabling transformative research.
- **Data Accessibility:** Garbhini-Drishti provides clear guidance on accessing the dataset for approved research purposes, fostering collaboration and impactful discoveries.
- **Comprehensive Assessments:** Participants undergo detailed assessments during pregnancy, including clinical evaluations, ultrasound imaging, and collection of various biospecimens. Post-natal follow-ups continue to capture critical maternal and neonatal health outcomes.
- **Quality Control:** The platform ensures the accuracy, reliability, and consistency of data collection through regular training of the research team and concurrent monitoring for errors.

Source: [PIB](#)

LYMPHATIC FILARIASIS (LF)

Context: Union Minister for Health and Family Welfare, Shri Jagat Prakash Nadda launched the Annual Nationwide Mass Drug Administration (MDA) Campaign for Lymphatic Filariasis (LF) Elimination.

Background: -

- The campaign covers 111 endemic districts across 13 States with door-to-door administration of filaria prevention medications.

Key takeaways

- Lymphatic Filariasis (Elephantiasis) is a neglected tropical disease (NTD) caused by filarial parasites (*Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*).
- **LF is commonly known as "Hathi Paon".**
- It is transmitted by mosquitoes (*Culex*, *Anopheles*, and *Aedes* species).
- The infection affects the lymphatic system, causing severe swelling (lymphedema), hydrocele (scrotal swelling), and elephantiasis (skin thickening & enlargement of limbs).
- **Acute Symptoms:**
 - Fever, pain, swelling of lymph nodes.
 - Inflammation of the skin and lymphatic vessels.
- **Chronic Symptoms:**

- Permanent swelling of limbs, genitals, and breasts (Elephantiasis).
- India accounts for ~40% of the global LF cases.
- **Government Initiatives to Eliminate LF:**
 - **The Mass Drug Administration (MDA) campaign** involves the supervised administration of a combination of anti-filarial medicines to all eligible individuals in LF-endemic areas, regardless of whether they show symptoms.
 - The goal of MDA is to reduce the spread of LF by eliminating the microscopic filarial parasites present in the bloodstream of infected individuals, thus preventing further transmission by mosquitoes.
- **India's Roadmap for LF Elimination by 2027**
 - Mass Drug Administration (MDA) campaigns in endemic districts.
 - Morbidity management and disability prevention (MMDP) for affected individuals.
 - Vector control measures like mosquito habitat management.

Source: [PIB](#)

DEFENCE AND SECURITY

EKUVERIN MILITARY EXERCISE

Context: The 13th edition of joint military exercise 'Ekuverin' between the Indian Army and the Maldives National Defence Force has commenced in the archipelago nation.

Background: -

- The term "Ekuverin" means "Friends" in the Dhivehi language of the Maldives. This exercise aims to strengthen the bilateral military ties between the two countries and enhance their ability to work together in various operations.

Key takeaways

- **Ekuverin** is a joint military exercise conducted annually between the Indian Army and the Maldives National Defence Force (MNDF).
- **Inception:** The exercise was first held in 2009 and has been conducted alternately in India and the Maldives.
- **Participants:** A platoon-level contingent from both the Indian Army and the MNDF participates in the exercise.
- **Focus Areas:** The primary focus is on enhancing interoperability in counter-insurgency and counter-terrorism operations, as well as conducting joint humanitarian assistance and disaster relief operations.
- **Recent Edition:** The 13th edition of the exercise commenced on February 2, 2025, in Maafilaafushi, Lhaviyani Atoll, Maldives, and will run until February 16, 2025.
- **Significance:** The exercise reflects the strong political and defence relationship between India and the Maldives, promoting regional security and stability.

Source: [News on AIR](#)

EXERCISE CYCLONE

Context: India- Egypt joint special forces exercise cyclone commences in Rajasthan.

Background: -

- Exercise Cyclone is an annual event conducted alternately in India and Egypt. The previous edition was held in Egypt in January 2024.

Key takeaways

- Exercise Cyclone is a joint military exercise between the Special Forces of India and Egypt, aimed at enhancing bilateral military cooperation, interoperability, and the exchange of special operations tactics. The exercise focuses on high levels of physical fitness, joint planning, and tactical drills in desert and semi-desert terrains.
- **Third Edition:** The third edition of Exercise Cyclone commenced on February 10, 2025, at the Mahajan Field Firing Ranges in Rajasthan, India, and is scheduled to conclude on February 23, 2025.

- **Participants:** The Indian contingent comprises troops from two Special Forces Battalions, while the Egyptian contingent includes members from the Special Forces Group and Task Force.
- The exercise aims to:
 - Promote military-to-military relations between India and Egypt.
 - Enhance interoperability and jointness in special operations.
 - Facilitate the mutual exchange of special operations tactics, techniques, and procedures.

Source: [PIB](#)

MUNICH SECURITY CONFERENCE

Context: German Chancellor Olaf Scholz delivered a strong rebuke to U.S. Vice President J.D. Vance's attack on Europe's stance toward hate speech and the far right, saying it was not right for others to tell Germany and Europe what to do.

Background: -

- Mr. Vance had lambasted European leaders on the first day of the Munich Security Conference, accusing them of censoring free speech and criticising German mainstream parties' "firewall" against the far-right Alternative for Germany (AfD).

About Munich Security Conference (MSC)

- **The Munich Security Conference (MSC)** is an annual forum that brings together global leaders, policymakers, and experts to discuss international security issues.
- **The MSC was founded by a German official and publisher Ewald-Heinrich von Kleist at the peak of the Cold War in 1963.** The conference initially focused on military issues and was mainly attended by Western countries, who came together to display a united front against Soviet communism.
- After the end of the Cold War, the conference expanded its agenda beyond defence and security to include issues like climate change and migration. It also began inviting leaders from eastern nations, including Russia, India and China.
- Today, the MSC, held in February every year, "seeks to promote trust and contribute to the peaceful resolution of conflicts by facilitating ongoing, curated, yet informal dialogue within the international security community".

Key Takeaways from the Munich Security Conference (MSC) 2025

Shift in the Transatlantic Security Framework

- **The North Atlantic Treaty Organization**, has been the cornerstone of European security, ensuring collective defense against external threats. However, recent developments indicate a fundamental shift. While U.S. remains a NATO member, European nations can no longer assume automatic U.S. military support in times of crisis.

U.S.-Russia Talks on Ukraine: A Policy Shift

- The U.S. administration has initiated diplomatic talks with Russia to negotiate an end to the Ukraine war, despite strong opposition from European leaders and Kyiv.

- Notably, Ukrainian President Volodymyr Zelensky has not been invited to these talks, raising concerns about Ukraine's exclusion from crucial negotiations affecting its sovereignty and security. The move has further strained U.S.-Europe relations.

Increased Defense Expenditure for European NATO Members

- The MSC discussions underscored the necessity for Europe to escalate its defense spending in response to Russia's growing military assertiveness. The current NATO-mandated minimum of 2% of GDP on defense is now expected to rise to 3%.
- While the U.S. has historically provided substantial military aid to Ukraine, European nations have now surpassed the U.S. in total financial and humanitarian assistance.

U.S. Vice President JD Vance's Controversial Speech

- U.S. V.P's speech was widely perceived as critical of European policies. Instead of reaffirming U.S. support for Ukraine, his remarks focused on Europe's handling of migration, free speech, and governance issues.
- His address was met with criticism from European leaders. However, the speech was well-received by certain political factions, including President Trump. This development signals growing ideological divergences between U.S. and Europe.

Economic Tensions and U.S.-Europe Trade Disputes

- Amid the discussions at MSC, Trump announced a 25% tariff on all steel and aluminum imports, effective from March. This decision exacerbates economic tensions between the U.S. and Europe, adding to existing disputes over trade policies and defense commitments.

Source: [BBC](#)

DISTRIBUTED DENIAL OF SERVICE (DDOS) ATTACK

Context: In January, web-based portal Kaveri 2.0, which streamlines property registrations in Karnataka, faced sporadic, crippling server outages. On investigating the outage, the Revenue Department and E-Governance Department concluded that it was a Distributed Denial of Service (DDoS) attack.

Background: -

- **DDoS attacks** can lead to a service downtime, which is the primary goal of a DDoS attack -- to render a service unavailable, leading to a disruption or potential loss of revenue.

Key takeaways

- **A DDoS attack is a malicious attempt** to disrupt the normal functioning of a targeted server, service, or network by overwhelming it with a flood of internet traffic.
- **Unlike a Denial of Service (DoS) attack**, which typically involves a single source, a DDoS attack leverages multiple compromised systems, often infected with malware, to generate the traffic. These compromised systems are collectively known as a botnet. Such attacks may be aimed at saturating the bandwidth of a site, exploiting weaknesses in the network protocol stack, or targeting specific weaknesses in applications or services.
- While DDoS attacks do not directly steal data, they can be used as a distraction while other forms of cyberattacks, such as data breaches, are executed.

- The Kaveri 2.0 portal, critical for property registrations, experienced performance issues recently. Fake accounts were created, and entries were made into the database using these accounts, overwhelming the system. The attack involved 62 email accounts originating from 14 IP addresses, highlighting the distributed nature of the assault.

Ways to mitigate such attacks

- Organisations implement advanced traffic filtering mechanisms to distinguish between legitimate and malicious traffic. Monitoring tools can help identify unusual traffic patterns and take pre-emptive actions.
- Enforcing rate limiting can control the number of requests a user can make in a given time frame, preventing the system from being overwhelmed.
- Bot detection technologies, such as CAPTCHA challenges and behavioural analysis, can identify and block automated tools or bots.
- Robust authentication mechanisms and regular security audits can strengthen the security of online services and prevent unauthorised access.

Source: [The Hindu](#)

INDIRECT PROMPT INJECTION ATTACKS

Context: Indirect prompt injection, a technique that manipulates chatbots into executing malicious commands, has become a significant concern for developers and users alike.

Background: -

- Despite efforts by tech giants like Google and OpenAI to fortify their systems, hackers continue to exploit vulnerabilities, leading to potential data breaches and misinformation.

Key takeaways

- Indirect prompt injection attacks are a significant security concern in the realm of generative AI systems, particularly those utilizing large language models (LLMs).
- Unlike direct prompt injections, where attackers input malicious commands directly into the AI system, indirect prompt injections involve embedding harmful instructions within external data sources that the AI system accesses. This can lead the AI to perform unintended actions, potentially compromising data integrity and user trust.

Mechanism of Indirect Prompt Injection Attacks:

- **Embedding Malicious Instructions:** Attackers insert concealed commands into data sources such as emails, documents, or web content. For instance, a malicious prompt might be hidden within an email that, when processed by an AI assistant, instructs the system to leak sensitive information or perform unauthorized actions.
- **Exploitation Through Data Access:** When the AI system accesses and processes this tainted data, it inadvertently executes the embedded instructions. This occurs because the AI cannot distinguish between legitimate data and malicious commands within the content it processes.

Potential Risks:

- **Data Exfiltration:** The AI might be manipulated to extract and transmit confidential information to

unauthorized entities.

- **Propagation of Malicious Content:** In scenarios where AI systems generate or summarize content, they might unknowingly disseminate harmful instructions embedded within the source material.
- **Unauthorized Actions:** AI systems integrated with tools or plugins could be directed to perform actions beyond their intended scope, such as sending unauthorized emails or accessing restricted data.

Mitigation Strategies:

- **Input Validation and Sanitization:** Implement rigorous checks to detect and neutralize hidden commands within external data before processing.
- **Contextual Differentiation:** Enhance the AI's ability to distinguish between executable instructions and regular data content, reducing the likelihood of unintended command execution.
- **Restricting External Data Access:** Limit the AI system's interaction with untrusted or unverified data sources to minimize exposure to potential threats.
- **Human Oversight:** Incorporate human review mechanisms for AI outputs, especially when dealing with sensitive information or actions, to catch anomalies.

Source: [The Hindu](#)

MISCELLANEOUS

DOMESTIC WORKERS

Context: Domestic workers and those who work towards the well-being of this vulnerable segment of the workforce have found hope with the Supreme Court's recent direction to the Union government to look into a law to regulate the sector.

Background: -

- SC ordered the government to form an inter-ministerial committee to consider the desirability of recommending a legal framework for the benefit, protection and regulation of the rights of domestic workers.
- India is yet to ratify the ILO Convention 189 on domestic workers.

Key takeaways

- The court noted that the poor conditions of domestic workers are largely due to the lack of appropriate regulations. The court highlighted the exclusion of these workers from many labour legislation, including the Minimum Wages Act and the Equal Remuneration Act.
- While acknowledging existing state-specific regulations, SC noted the importance of having national-level legislation that is binding on all states.
- Domestic work is a feminised occupation, with migrants from marginalised communities constituting a considerable proportion.
- Low wages, unfair working conditions, the obligation to attend to additional tasks, increased workload without additional compensation are the key features that mark the sector. Job insecurity and complete absence of social security measures force the workers to accept vulnerable conditions of work.

Why domestic workers needs separate legislation

- **The Code on Wages (2019), unlike the Minimum Wages Act**, by definition covers the sector. But the intricacies, complexities and hierarchies of the occupation which intersects with gender, caste, and class makes the sector distinct.
- The different systems of employment of workers — part-time/full-time, live in/live out — have contributed to the complexity of the sector.
- The asymmetric relationship between employer and employee, where the workplace is the former's private space and the latter's workplace is an issue that makes the sector qualitatively different.
- Further, the work undertaken — mundane cleaning tasks and cooking or care work — are all socially devalued.

Challenges and way forward

- The definition of what constitutes domestic work needs to be carefully worked out.
- One of the prerequisites for enforcement of any labour regulation is proof of employment.

Most employers do not view themselves as “employers” or their homes as “workplaces”.

- The recent attempts in the direction of the states of Kerala and Delhi could be looked at for learning.

Source: [Indian Express](#)

SOLIGA

Context: Prime Minister Narendra Modi made a reference to Soligas of BRT Tiger Reserve in the 119th edition of Mann Ki Baat and praised their contribution to tiger conservation.

Background:

- **The National Tiger Conservation Authority (NTCA) report** on the tiger population for BRT Tiger Reserve indicated the presence of 69 tigers in 2014. This number went up to 86 in the 2018 report. However, the NTCA’s 2022 report on the “Status of Tigers, Co-Predators, and Prey” noted a decline in the tiger population and attributed it to the presence of humans and habitat degradation.

Key takeaways

- **The Soliga, also spelled Solega, Sholaga, and Shōlaga, are an indigenous tribal community primarily residing in the Biligirirangana Hills (BR Hills) and Male Mahadeshwara Hills of Karnataka, India, with some populations in the Erode district of Tamil Nadu.**
- Their name, "Soliga," translates to "children of bamboo," reflecting their deep-rooted connection with nature.
- Language: The Soliga speak Sholaga, a Dravidian language closely related to Kannada and Tamil.
- Historically, the Soliga practiced shifting cultivation and were dependent on the forest for their livelihood, collecting **non-timber forest products (NTFP)** such as honey, gooseberries, bamboo, and various medicinal plants. They possess extensive knowledge of over 300 herbs used for treating various ailments.

Cultural and Religious Practices

- The Soliga follow a blend of naturism, animism, and Hinduism.
- Sacred sites such as Dodda Sampige, a large Michelia champaka tree, hold significant spiritual importance.

Legal Recognition and Conservation Efforts

- In 2011, the BR Hills region was declared a tiger reserve, leading to restrictions on traditional practices.
- The Soliga community legally contested these limitations and became the first tribal group in India to have their forest rights recognized within a core area of a tiger reserve. They have since collaborated in conservation efforts, contributing to the doubling of the tiger population between 2011 and 2015.

Source: [The Hindu](#)

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MAINS

PAPER 1

Begging

GS I – Social Empowerment

Context: The Bhopal district collector issued an order completely prohibiting begging across all public places within the district's jurisdiction.

Reasons/Factors Contributing to Begging:

- Individuals especially from marginalised communities are forced into begging as a means of survival due to widespread poverty.
- The high unemployment rates, especially among the unskilled and semi-skilled labour force, push people towards begging.
- The lack of education limits employment opportunities, perpetuating the cycle of poverty and begging.
- The systematic exclusion of a few communities forces them to beg for sustenance.
- Individuals with mental health issues, lacking family support and proper care, often end up begging on the streets.
- Women and children who flee their homes due to family disintegration and domestic violence resort to begging.
- Lack of adequate social security measures and weak implementation of welfare schemes fail to provide a safety net for the most vulnerable.
- Organized crime syndicates exploit vulnerable individuals, including children and disabled persons, forcing them into begging.

Impact of Begging on Society:

- It risks public health as begging hotspots often lack sanitation, leading to the spread of diseases.
- There is a high risk of child trafficking and forced labour due to organized begging rings.
- The risk of drug addiction and substance abuse is high among beggars.
- Aggressive begging in cities affects tourism and damages India's global image.
- Many beggars are arrested under anti-begging laws without alternative rehabilitation.

Legal Framework Regarding Begging:

- The Constitution of India allows both the union and state governments to enact laws on vagrancy (including beggary), nomadic, and migratory tribes under the Concurrent List (List III, Entry 15).
- The Supreme Court of India in 2021 rejected a Public Interest Litigation seeking to remove beggars from public spaces, emphasizing that begging is a socio-economic problem rather than a criminal issue.
- Support for Marginalised Individuals for Livelihood and Enterprise (SMILE) was launched in 2022 by the Ministry of Social Justice and Empowerment that aims to rehabilitate beggars by providing medical care, education, and skills training, working toward a "beggar-free" India by 2026.

Way Forward:

- The government should take measures to strengthen poverty alleviation programs like the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) to ensure minimum wage employment.
- There is a need to create comprehensive skill development programs to improve employability and provide alternative livelihoods.

- Measures should be taken to access free and quality education for children, coupled with mid-day meal schemes to incentivize school attendance.
- Steps should be taken to enhance the reach and effectiveness of social security schemes like pensions, health insurance, and housing for vulnerable populations.
- There is a need to strengthen family support services to address domestic violence and family breakdown, providing safe shelters and counselling.
- Measures should be taken to implement strict laws and enforcement mechanisms to dismantle organized begging rackets and human trafficking networks.

Rock Glaciers

GS I– Important Geophysical Phenomena

Context: A recent study has shed light on the presence of over 100 active rock glaciers in the Jhelum basin of the Kashmir Himalayas. They have significant implications for the region's hydrology and pose potential risks as the climate warms.

Rock Glaciers:

- They are a type of landform that consists of a **mixture of rock fragments and ice which are** typically formed in **mountainous regions** where there is a combination of **permafrost, rock debris, and ice**.
- They occur in highly elevated regions with steep slopes.

Classification of Rock Glaciers:

- They are classified as **active or relict**, depending on whether they have ice and movement or not.
- **Active rock glaciers are more dynamic** and hazardous.
- **Relict rock glaciers are more stable and inert**.

Importance/Significance of Rock Glaciers:

- They are important indicators of **mountain permafrost**, which is the permanently frozen ground that underlies many high-altitude regions.
- They store **significant amounts of water** in their frozen cores, which could be a valuable resource in the face of **water scarcity and glacial retreat**.

Potential Impacts of the Active Rock Glaciers on the Region:

- The **active rock glaciers could increase the risk of glacial lake outburst floods (GLOFs)** by destabilizing the slopes or the dams of glacial lakes. Rock glaciers near glacial lakes, such as **Chirsar Lake and Bramsar Lake, increase the risk of GLOFs**.
- The active rock glaciers could **cause landslides by weakening** the slope stability or by melting and releasing water that could lubricate the sliding mass. The melting permafrost makes these areas unstable, posing risks to nearby settlements and critical infrastructure. For example, the **Nunavik area in Quebec was mostly built on permafrost** ground many years ago. In the last decades, the **ice in the underlying layers began to melt** due to global warming, increasing the frequency of mudslides and other dangers.
- The **active rock glaciers could lead to the formation of thermokarst features**, such as ponds or lakes, that could alter the **hydrology, ecology, and carbon cycle of the region**. The presence of **water bodies near Kulgam town, Jammu, and Kashmir suggests the existence of permafrost underground, resembling 'thermokarst lakes'**, which can pose further risks.
- The melting of ice underneath the earth's surface is a high risk of collapse. The collapse leads to the formation of a landscape whose features are sinkholes, hummocks, caverns, and tunnels.

Permafrost:

- It is a permanently frozen layer on or under the Earth's surface. It consists of **soil, gravel, and sand, usually bound together by ice.**

Glacial lake outburst floods (GLOFs):

- **They** are sudden and **catastrophic floods that occur when a glacial lake bursts** its natural or artificial dam, releasing large volumes of water and debris downstream.

Landslides:

- They are the **rapid movements of soil, rock, or snow down a slope**, often triggered by **earthquakes**, rainfall, or human activities.

Thermokarst:

- It is a type of **terrain that is characterized by irregular surfaces of marshy hollows** and small hummocks (ridges), formed by the **thawing of ice-rich permafrost.**

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PAPER 2

Centrally Sponsored Schemes (CSS) and Fiscal Federalism

GS II – Issues and challenges pertaining to the federal structure

Context: The Centre reduced the outlay on centrally sponsored schemes for the current financial year by a whopping Rs 91,000 crore or 18% of the budget estimate for the schemes due to the discovery of Rs 1.6 lakh crore unspent balances with them from previous transfers, reflecting a lack of absorptive capacity in states.

Centrally Sponsored Schemes (CSS):

- They are jointly funded by the centre and states but are implemented by states.
- They cover sectors under the State and Concurrent Lists of the Constitution.
- They supplement the efforts of state governments, as the central government has greater financial resources.
- All transfers to states for CSSs are being routed through the Consolidated Fund of the State.
- The union government allocates about 12% of its budget to CSS, with funding shared in varying centre-state ratios:
 - 60:40 for the majority of schemes
 - 80:20 for some schemes
 - 90:10 for north-eastern and special category states
- They are divided into three main categories:
 - The core of the core schemes is the most crucial for social inclusion and protection.
 - The core schemes focus on various developmental sectors such as agriculture, infrastructure, education, health, and rural development.
 - The optional schemes in which states are free to choose the ones they wish to implement.

Article 282:

- It allows both the union and states to make grants for any public purpose, even if the purpose is outside their legislative jurisdiction.
- The grants under Article 282 are discretionary and not bound by Finance Commission (FC) recommendations.

Ways in which Centrally Sponsored Schemes (CSS) are Posing Challenges to Fiscal Federalism:

- Grants under Article 282 the union or a state can grant funds for any public purpose, even if it lacks legislative authority over it which results in discretionary funding.
- They have strict fund utilization conditions, limiting states' flexibility to adapt them to local needs.
- The 15th Finance Commission (2021-26) highlighted the union holds 63% of resources but spends 38%, while states get 37% but bear 62% of expenditure which makes states depend on CSS funds.
- They require states to provide matching grants, diverting their resources from state-priority sectors.
- During Constitutional debates, Dr. BR Ambedkar emphasized a co-equal partnership between the union and states but over-reliance on discretionary CSS grants undermines the constitutional intent of cooperative federalism.
- They have increasingly been used as political instruments to control states. For instance, the Ministry of Finance's 2022 guidelines included a Rs 50,000 crore interest-free loan for states willing to disinvest public sector enterprises, a move opposed by several states.

Antivenoms in India

GS II – Health

Context: An estimated 58,000 Indians die every year from venomous snakebite, a terrible number that renders India the ‘snakebite capital’ of the world and highlights the scale of this preventable crisis.

Status of Snake Bite in India:

- As per ICMR study, India has seen an estimated 1.2 million (12 lakh) snakebite deaths from 2000 to 2019, an average of 58,000.
- India accounts for almost **50% of global snakebite deaths**.
- The **snakebite envenoming (poisoning from snake bites)** was classified by the **World Health Organisation (WHO)** as a high-priority **neglected tropical disease**.
- India is home to more than 300 species of snakes, of which more than 60 are venomous, ranging from mild to high. The so-called Big Four — Indian cobra (*Naja naja*), common krait (*Bungarus caeruleus*), Russell’s viper (*Daboia russelii*), and the saw-scaled viper (genus *Echis*) — account for most snakebite deaths.

Antivenoms (Antivenins):

- They are life-saving medicines used to treat snakebites.
- They are produced by injecting small amounts of venom into animals, usually horses, which then produce antibodies as part of their immune response. These antibodies become antivenoms.
- They are the frontline defence. They work by specifically binding to the venom toxins to render them ineffective, allowing the body’s natural defence systems to clear them safely over time.
- Its production involves extracting venom from snakes, immunizing animals like horses or sheep to produce antibodies, and then extracting and purifying these antibodies from the animal’s blood to formulate the antivenom.

Issues/Challenges in Accessing Antivenoms in India:

- The timely treatment gets hindered as remote areas lack proximity to healthcare facilities equipped with antivenom.
- Superstitions and reliance on traditional practices regarding snake bites in rural areas often delay seeking medical care.
- The high cost of manufacturing antivenom limits accessibility for the economically disadvantaged.
- Antivenoms often need to be transported in cold storage, however, India’s rural parts lack the supporting infrastructure and power supply.

Way Forward:

- National Action Plan for Prevention and Control of Snakebite Envenoming (NAP-SE) aims to halve the number of deaths and disabilities caused by snakebites by 2030.
- Recombinant DNA technology and AI-designed proteins, as demonstrated by 2024 Nobel laureate David Baker’s team, offer safer and more effective alternatives to traditional antivenoms.
- IISc Bengaluru researchers are developing antivenoms tailored to specific snake species and regional venom variations.
- Portable venom-detection kits can guide accurate and timely administration of antivenoms, improving patient outcomes.

Artificial Intelligence (AI) in Elections

GS II – Elections

Context: Amid an increase in the use of Artificial Intelligence (AI)-generated campaign content, the Election Commission of India wrote to the heads of all recognized national and state political parties asking them to label all such campaign material as “AI-generated/digitally enhanced/synthetic content”.

Artificial Intelligence:

- AI is defined as the **ability of machines** and systems to **acquire and apply knowledge and to carry out intelligent behaviour**.
- The term "Artificial Intelligence" was coined by **John McCarthy**, an American computer scientist and cognitive scientist. He was one of the founders of the discipline of AI.
- It includes technologies like **Machine Learning, Deep Learning, Big Data, Neural Networks**, Computer vision, **Large Language Models**, etc.

Significance/Role of AI in Elections:

- The prediction models can be built using AI. It will help determine the probability of a voter backing a specific candidate. Factors such as demographics, voting patterns, and issues that matter can be considered to build a model that helps identify the voters who will vote for a particular candidate.
- Using AI, parties can analyze the trends and sentiment to build a social media outreach program, as per the voters' preferences.
- AI can aid in tailoring communications for specific voters based on their interests, preferences, and traits. This can assist candidates in connecting with the audience more deeply.
- Campaigns may adapt their messaging and outreach methods in reaction to shifting conditions by using AI to evaluate real-time data on social media trends, sentiment, and influencers.
- AI can track and measure the performance of various campaign activities such as advertising, canvassing, and events. This enables campaigns to identify what works and doesn't and make data-driven decisions to optimize their activities.
- AI also generates chances for participative democracy, like enhanced voter education and mobilization.

Issues/Concerns associated with AI in Elections:

- AI can be used to create deepfake videos, misinformation, and social media manipulation, influencing voters and distorting the truth. Public figures can be defamed or even blackmailed with deepfakes, influencing political life or withdrawing from elections or politics.
- AI tools can be used to conduct an influence campaign that has the potential to undermine public trust in democratic institutions and elections.
- There is a lack of comprehensive regulation specifically addressing the use of AI in elections.
- The effectiveness and precision of AI systems deployed in political campaigns are hindered by the accuracy and reliability of the algorithms used, as well as the quality and quantity of available data.
- Using AI to gather and analyze personal voter data raises privacy and data protection concerns due to the lack of cyber security infrastructure, data storage devices, and increased cyber-attacks.

News:

- Artificial Intelligence-generated campaign content should have 'AI-generated', 'digitally enhanced', or 'synthetic content' labels, the Election Commission said.
- The EC said it was important to maintain transparency and accountability as the AI videos, images, and audio being used had the potential to influence voters. It also asked the parties to clearly label all such content and include disclaimers in campaign advertisements where such content is used.

Domestic Workers

GS II – Salient features of Indian society

Context: Anguished by the years of abuse an impoverished tribal woman from Chhattisgarh suffered as a domestic worker in the national capital and neighbouring cities, the Supreme Court directed the Union government to work on bringing a law to protect this burgeoning but unorganized workforce from exploitation.

Domestic Workers:

- According to the International Labour Organization, domestic workers are those workers who perform work

in or for a private household or households.

- Domestic work is a feminized occupation, with migrants from marginalized communities constituting a considerable proportion.
- Wage rates and other non-wage benefits vary across the tasks performed by the worker and the nature of employment. There is variation in wages across employers for a given task even in the same locality.
- India is yet to ratify the ILO Convention 189 on domestic workers.

Status of Domestic Workers in India:

- According to official statistics, there are 4.75 million domestic workers in India, three million of whom are women, the International Labour Organisation, along with others are firm that the real number is much more, ranging from a wide 20 to 80 million.

Characteristics of Domestic Workers:

- Their work is informal and unregulated as most domestic workers lack job contracts, social security, and legal protection.
- Some workers live with their employers, while others work in multiple households as part-time workers.
- They often migrate from poverty-stricken states to cities due to extreme poverty and a lack of job opportunities.
- They are primarily composed of marginalized communities from Scheduled Castes (SCs), Other Backward Classes (OBCs), and Scheduled Tribes (STs).

Issues/Concerns of Domestic Workers in India:

- Most of them earn below the minimum wage, with no formal contracts. They are not included under key labor laws, like the Minimum Wages Act and the Equal Remuneration Act, resulting in a lack of fair wage rights.
- They often work excessive hours without breaks or overtime pay.
- They don't have access to benefits such as health insurance or maternity leave, with limited welfare support in some states.
- They face physical and emotional abuse, including beatings, harsh conditions, sexual harassment, forced labour, and human trafficking, particularly minors from vulnerable communities.
- Female workers are vulnerable to sexual abuse. Many cases of abuse go unreported due to fear of retaliation or the lack of legal recourse.
- Placement agencies exploit domestic workers by charging high fees for employment, without guaranteeing fair wages or safe conditions.

Example Models:

- **Kerala's Welfare Board** provides financial aid, medical benefits, and pension schemes to registered domestic workers.
- **Delhi's Draft Policy for Domestic Workers** proposes mandatory registration, written contracts, and social security provisions for domestic workers.
- **South Africa's Domestic Workers Act** recognizes domestic work as formal employment, ensuring minimum wages, social benefits, and protection from abuse.

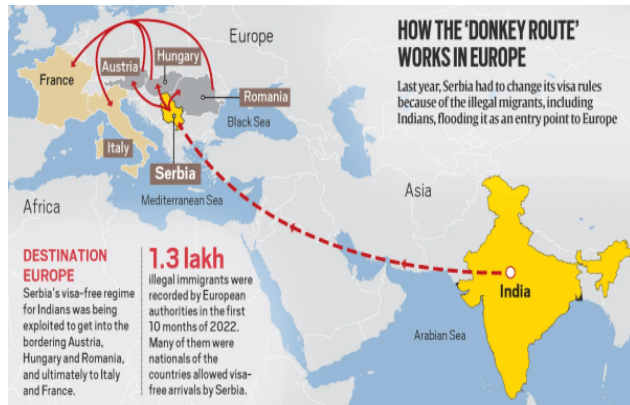
Dunki Route – Illegal Immigrants

GS II – Indian Diaspora

Context: US military aircraft carrying 104 deported Indian nationals landed at Amritsar airport on 5th February 2025. According to the deportees, they spent between Rs 30 lakh and Rs 1 crore in expenses and agent fees in their efforts to reach the US, mostly through what is known as the "dunki route".

Dunki” or “Donkey Journey”:

- It refers to the **long-winded**, often dangerous routes that people across the world take to reach the places they want to immigrate to. These difficult journeys are undertaken due to a lack of requisite legal permits or financial resources. The American authorities have deported those who have taken this illegal route to reach America.

Reasons for Migration of Indians:

- The lack of job opportunities in India forces people to migrate. People often seek better prospects elsewhere.
- Low wages and poor job security worsen the situation. Rural distress also contributes to migration.
- Migration is often a matter of survival, not a choice. It is driven by economic necessity.

Deportation:

- **It** is the process of removing a non-citizen from the US for violating immigration law.

- The US may detain and deport non-citizens who participate in criminal acts, are a threat to public safety; or violate their visa.
- The foreign national may be held in a detention centre before trial or deportation.

Issues with Deportation:

- Deportees are often treated inhumanely in foreign countries. They face terrible conditions abroad.
- India often fails to provide legal or financial assistance which leaves deportees helpless.
- Many deportees lose assets like bank accounts.

India’s action after the deportation:

- After the deportation of the illegal migrants from the USA, the Indian government said that it is “seriously considering” enacting a new law, tentatively titled **‘Overseas Mobility (Facilitation and Welfare) Bill, 2024’**, to establish an enabling framework that will promote “safe, orderly and regular migration for overseas employment”.
- Keeping in view the “contemporary global migration dynamics and the needs of Indian citizens”, it says that the committee has over the years underscored the pressing need for a comprehensive legislative overhaul to replace the outdated provisions of the **Emigration Act 1983**.
- The ministry said that Indian missions/consulates spread awareness amongst emigrants and issued advisories for prospective emigrants. These awareness activities such as advisories equip emigrants with information on safe migration practices, registered recruiting agents, valid foreign jobs, and ways to avoid fraudulent recruiting agencies.

Note:

- According to the US Immigration and Customs Enforcement’s Fiscal Year 2024 Annual Report, Honduras, Mexico, Guatemala, and El Salvador remain the top countries where citizens are deported or repatriated from the US.

Consumer Protection in India**GS II – Statutory Bodies**

Context: Recently, the Central Consumer Protection Authority (CCPA) has imposed a penalty of Rs 3 lakh on Vision IAS for deceptive advertising about its students’ success in the civil services examination.

Initiatives/ Measures taken for Consumer Protection in India:

- The Consumer Protection Act (CPA) 2019 provides for the Central Consumer Protection Authority (CCPA).
- Consumer Protection (Jurisdiction of District Commission, State Commission, and National Commission) Rules, 2021 provide simple, speedy, and inexpensive redressal of consumer disputes.
- ConfoNet Project stands for Computerization and Computer Networking of Consumer Fora in the country. It was implemented in the backdrop of CPA, in 1986. It aims to improve operational efficiency, coordination, accessibility, and speed in judicial administration and to set Information Communication Technology (ICT) infrastructure at Consumer Redressal commissions all over India.
- The Integrated Grievance Redress Mechanism (INGRAM) Portal was developed under the aegis of the Department of Consumer Affairs to create awareness, advise, and redress consumer grievances and act as a central registry for lodging consumer grievances.
- E-Daakhil Portal provides a hassle-free, speedy, and inexpensive facility to consumers around the country to conveniently approach the relevant consumer forum, dispensing the need to travel and be physically present.
- Certification markers to protect and sensitize consumers regarding quality standards.

Difference between the Consumer Protection Act of 1986 and the Consumer Protection Act of 2019:

CONSUMER PROTECTION ACT 1986	PROVISIONS	CONSUMER PROTECTION ACT 2019
No separate regulator	Regulator	Central Consumer Protection Authority (CCPA) to be formed
Complaint could be filed in a consumer court where the seller's (defendant) office is located	Consumer court	Complaint can be filed in a consumer court where the complainant resides or works
No provision. Consumer could approach a civil court but not consumer court	Product liability	Consumer can seek compensation for harm caused by a product or service
District: up to ₹20 lakh State: ₹20 lakh to ₹1 cr National: above ₹1 cr	Pecuniary jurisdiction	District: up to ₹1 cr State: ₹1 cr to ₹10 cr National: Above ₹10 cr
No provision	E-commerce	All rules of direct selling extended to e-commerce
No legal provision	Mediation cells	Court can refer settlement through mediation

Image Source: The Economic Times

National Consumer Rights Day:

- It was established in India to commemorate the enactment of the Consumer Protection Act of 1986, which was approved by the then-President of India on December 24, 1986. Since then, 24th December has been celebrated as National Consumer Day.
- Consumer Rights Day is dedicated to raising awareness about consumer rights and promoting fair trade practices. The theme for National Consumer Day in 2024 was "Virtual Hearings & Digital Access to Consumer Justice."

Central Consumer Protection Authority (CCPA):

- The Central Consumer Protection Authority (CCPA) is India's apex consumer watchdog. It was established under Section 10(1) of the Consumer Protection Act, 2019, and became operational on 24th July 2020.
- It is tasked with regulating matters related to the violation of consumer rights, unfair trade practices, and false or misleading advertisements that are prejudicial to the interests of consumers as a class and the public at large.
- **Powers and Functions of CCPA are:**
 - Protect, promote, and enforce the rights of consumers as a class, and prevent violation of consumers' rights under this Act;
 - Prevent unfair trade practices and ensure that no person engages himself in unfair trade practices;
 - Ensure that no false or misleading advertisement is made of any goods or services which contravenes the provisions of this Act or the rules or regulations made there under;
 - Ensure that no person takes part in the publication of any false or misleading advertisement.
 - File complaints before the Consumer Commission and review the matters relating to consumer rights.
 - Recommend adoption of international covenants on consumer rights.
 - Promote awareness on consumer rights and research in the field of consumer rights.
 - (viii) Advise the ministries and departments of the central and state governments on consumer welfare measures.

Examination System in India

GS II – Education

Context: Reforming the examination system to ensure its credibility is a key way to improve educational standards.

Issues/Concerns regarding the existing examination system in India:

- Scandals during examination seasons **impact the credibility of examination** boards. Lack of credibility affects educational standards as teaching aligns with examination patterns, often promoting rote learning.
- Midterms, semester exams, and unit tests provide a lighter schedule but encourage **short-term memorization**. Students often study for marks, forgetting the learned content soon after exams.
- The validity and comparability of the summative examination across **institutions are meaningless today**. There are complaints that examination boards **test only memory, leading to students being coached to memorize** answers rather than develop higher-order thinking. Additionally, question papers often have grave flaws such as language errors, irrelevant questions, and errors in conceptualization.
- The examination system is **prone to cheating and malpractices**, such as **copying, leaking, impersonation**, etc. This undermines the credibility and quality of the assessment and the education system.
- Secrecy and standardization are considered hallmarks of good examination boards, but **secrecy without proper checks leads to scandals**.
- **Uniformity in examinations**, while seeking consistency, can **hinder experimentation in assessment and curriculum**. This poses a notable risk to the credibility of education. Balancing **standardization with room for innovation** is essential for a dynamic and effective education system.
- Employers rely on their **assessments rather than institutional certifications** for evaluating candidates. The emphasis on higher-order learning is crucial for employability, yet institutional examinations often fall short. This in turn has created a **coaching market** for competitive examinations and skilling.

Steps that can address the challenges in the examination system in India:

- Specify **minimum standards of learning outcomes** to provide a clear benchmark.
- Encourage academics across disciplines to contribute to curriculum design, pedagogy, and assessment systems.
- Incorporate subject-specific and skill-specific assessment processes to ensure a comprehensive evaluation. Expect university degrees and school board **certificates to truly reflect the learning achievements of students**.
- Emphasize continuous assessment throughout the course, with teacher involvement and student participation.
- Utilize technology in assessments to enhance credibility, standardizing question papers and evaluations.
- Explore **market-available software solutions** for both centralized and distributed assessment systems.
- Conduct regular external audits of assessment systems in universities and school boards.
- Establish benchmark principles and standards for **audit reports, ensuring reliability and consistency**.
- Grade examination boards based on transparency, reliability, and consistency, reflecting these aspects in audit reports.
- Implement measures for transparency, allowing students to access the evaluation process and address grievances.

India – France Relations

GS II – Bilateral Relations

Context: Prime Minister Narendra Modi visited France at the invitation of French President Emmanuel Macron

Major areas of cooperation between India and France:

- India and France **share long-standing cultural, trade, and economic linkages**. The India-France strategic **partnership, signed in 1998**, has gathered significant momentum over time. Both countries **have held on to three pillars in the relationship**:
 - Mutual respect for **non-interference in internal matters**.
 - A firm commitment to **strategic autonomy and non-alignment**.

- A shared stance of **refraining from involving each other** in respective coalitions and alliances.
- Bilateral trade between the two countries reached a new **peak at USD 13.4 billion in 2022-23**, with exports from India crossing USD 7 billion. France is the 11th largest foreign investor in India, with a cumulative investment of USD 10.49 billion from April 2000 to December 2022.
- The **defence partnership is the core of India-France relations**. The **Rafale deal** to the acquisition of 26 Marine versions of Aircraft, the technology transfers by France have already helped India construct **six Scorpene-class submarines** with another three now being procured to boost the navy's falling numbers. **Joint Exercises - Exercise Shakti (Army), Exercise Varuna (Navy), Exercise Garuda (Air Force)**.
- France announced that it disapproves of a **North Atlantic Treaty Organisation (NATO)-plus (NATO+)** partnership plans, that would see the Trans-Atlantic alliance build direct ties with Japan, Australia, New Zealand, South Korea, and even India. India has also rejected the plan saying that NATO "is not a template that applies to India".
- France supports India's bid for permanent membership of the **United Nations Security Council** as well as its entry into the **Nuclear Suppliers Group**.
- Both countries are concerned about climate change, and India has supported France in the **Paris Agreement** expressing its strong commitment to mitigating the effects of climate change. Both countries, as part of their joint efforts on climate change, launched the **International Solar Alliance** in 2015.

Concerns/Issues/Challenges in India-France Relations:

- The absence of an **FTA (Free Trade Agreement) between** France and India hinders the maximization of their trade potential. The slow progress on the **India-EU Broad-Based Trade and Investment Agreement (BTIA)** further compounds the challenges in fostering comprehensive economic cooperation.
- Despite a strong defence partnership, differences in priorities and approaches can influence defence and security cooperation. India's regional focus and its "non-aligned" policy may at times clash with France's global interests.
- France has raised concerns **about India's inadequate protection of intellectual property rights**, impacting French businesses operating within India. This presents a challenge to fostering a conducive environment for bilateral trade.
- Although France is India's 11th trade partner, there is a notable trade imbalance. The dominance of defence products in the trade relationship **poses challenges to diversification and achieving a more balanced** economic exchange.
- India has faced challenges in exporting its products to France, particularly in the context of **Sanitary and Phytosanitary (SPS) measures**. This can act as a discouragement to Indian products entering the French market.
- While the French President announced plans to **welcome 30,000 Indian students to France**, issues related to student mobility, including visa processes and cultural integration, may pose challenges to realizing this goal.
- **Instances such as the Nicaragua flight case** involving **human trafficking raise** concerns and underscore the need for enhanced cooperation in addressing transnational crimes and ensuring the safety and well-being of individuals.

Key Outcomes of the Recent France Visit:

- Both nations pledged to deepen collaboration in AI research and applications, with a focus on ethical and responsible AI development.
- The official logo for the **India-France Year of Innovation 2026** initiative was unveiled, symbolizing a shared commitment to fostering innovation and scientific collaboration.
- A Letter of Intent was signed between India's Department of Science and Technology (DST) and France's INRIA to establish a dedicated center for digital sciences, promoting research and development.
- An agreement was signed to host 10 Indian startups at France's premier startup incubator, Station F, fostering entrepreneurial growth.
- A Declaration of Intent was signed to strengthen cooperation on next-generation nuclear reactor technologies. India's Department of Atomic Energy (DAE) and France's CEA renewed their agreement, reinforcing the partnership in nuclear energy.
- A new implementing agreement was signed between DAE and CEA to enhance cooperation between India's Global Center for Nuclear Energy Partnership (GCNEP) and France's Institute for Nuclear Science and

Technology (INSTN).

- **Both countries** issued a joint declaration of intent to collaborate on sustainable development projects in the Indo-Pacific region.
- **Indian** PM along with French officials, inaugurated India's new consulate in Marseille, strengthening diplomatic and people-to-people ties.
- A Declaration of Intent was signed between India's Ministry of Environment, Forest and Climate Change, and France's Ministry for the Ecological Transition to enhance cooperation on biodiversity conservation, climate action, and sustainable development.

India – EU Relations

GS II – Bilateral Relations

Context: With the European Commission of 27 commissioners, led by President Ursula von der Leyen, set to visit India later this month, External Affairs Minister S Jaishankar said it is "really time" that India and the European Union (EU) begin taking the next step on a free trade agreement (FTA).

India-EU Relations:

- **India- EU Strategic Partnership** signed in **2004**.
- **They adopted the EU-India Joint Action Plan in 2005** dealing with political, economic, and development cooperation.
- In 2023-24, India's trade in goods with the EU stood at USD 137.41 billion, making the EU India's largest trading partner in goods. Bilateral trade in services was valued at USD 51.45 billion in 2023.
- The EU is a major investor in India, accounting for 17% of total FDI inflow, contributing to significant employment opportunities.
- Both India and the EU are committed to the Paris Climate Agreement, but they face different challenges in addressing climate change. India prioritizes economic growth and development, balancing the need for industrialization with environmental concerns whereas the EU pushes for stricter climate regulations, having already achieved a level of development that allows it to focus more heavily on environmental standards.
- The India-EU Civil Nuclear Cooperation Agreement holds significant potential to increase investments in nuclear energy, which can help India meet its energy demands while reducing carbon emissions.
- The EU provides significant financial assistance for India's social development programs, including the Sarva Shiksha Abhiyan (SSA) for education and the National Rural Health Mission (NRHM) for healthcare.
- The EU's Enhancing Security Cooperation in and with Asia (ESIWA) initiative strengthens security cooperation with Asia, including India, to secure sea lanes, as the Indian Ocean is a vital route for the EU.

Issues/Challenges in India-EU Relations:

- The European Union is constantly evolving, and its internal divisions often slow down decision-making processes.
- Each EU member country has its foreign policy priorities, making it challenging to develop a unified approach towards India. This lack of political cohesion within the EU hampers the potential for more streamlined and consistent cooperation.
- Despite political differences, the EU maintains strong economic ties with China, which creates a level of caution for India regarding the EU's strategic commitments.
- Free Trade Agreement negotiations between India and the EU, initiated in 2007, have faced delays due to disagreements.
- The EU does not offer significant security assistance to India, which limits the scope of their security collaboration.

European Union (EU):

- It is a political and **economic union of 27 member states** located primarily in Europe.
- It was established by the **Maastricht Treaty**, which entered into force on November 1, 1993.

- The main goal of the EU is to promote cooperation and integration among its member states to enhance economic and political stability in Europe.

The governance structure of the EU:

- The European Council is made up of the heads of state or governments of the EU member states. It sets the EU's overall political direction.
- The European Commission is the executive branch of the EU.
- The European Parliament is the directly elected legislative body of the EU.
- **The Council of the EU** is the main decision-making body of the EU. It represents the interests of member states and is responsible for adopting legislation and coordinating policies.

Immigration and Foreigners Bill of 2025

GS II – Government policies and interventions for development in various sectors and issues arising out of their design and implementation

Context: The Immigration and Foreigners Bill of 2025 is likely to be introduced by Union Home Minister Amit Shah in the ongoing Budget session of Parliament.

Immigration and Foreigners Bill of 2025:

- The proposed legislation will replace the existing laws — the Passport (Entry into India) Act, 1920; the Registration of Foreigners Act, 1939; the Foreigners Act, 1946; and the Immigration (Carriers' Liability) Act, 2000.
- It aims to **streamline immigration laws**, bringing them in line with modern security needs and regulatory requirements.

Key Features of the Immigration and Foreigners Bill of 2025:

- **It proposes hefty fines and stricter enforcement mechanisms for violations of immigration laws as below:**
 - Unauthorised entry into India imposes a penalty of up to ₹5 lakh.
 - The use of fake passports imposes a fine of up to ₹10 lakh.
- It explicitly defines the roles and responsibilities of universities, hospitals, and medical institutions that admit foreign nationals:
 - Educational institutions must register foreign students and report them to authorities.
 - Hospitals and medical institutions admitting foreign nationals will have legal obligations to maintain records.
- It grants the central government greater control over visa regulations, passport requirements, and foreigner registration as below:
 - Stricter requirements for obtaining Indian visas.
 - Enhanced scrutiny of foreigners residing in India.
 - Improved tracking mechanisms for visitors and long-term foreign residents.
- **It has given more power to immigration officers as below:**
 - Greater authority to detain, investigate, and deport illegal immigrants.
 - The power to control movements of restricted foreigners.
 - The right to deny entry is based on security risks.
- It includes provisions holding transport operators responsible for carrying unauthorized foreigners into India:
 - Airlines, shipping companies, and transport agencies must verify passenger documents before boarding.
 - Carriers found in violation will face legal penalties.

Significance of the Immigration and Foreigners Bill of 2025:

- The penalties proposed by the bill aim to deter illegal immigration and document fraud, ensuring better compliance with entry and exit regulations.
- It has provisions to ensure better tracking of foreigners in India and prevent misuse of visas.

- It intends to tighten border security and improve monitoring of foreigners staying in India.
- It will strengthen India's border security and internal monitoring system by giving more powers to immigration officers.
- It ensures better enforcement of international travel norms and prevents illegal entry into India by holding transport operators accountable.

Issues/Challenges regarding the Immigration and Foreigners Bill of 2025:

- It could lead to stricter deportation policies, affecting long-term foreign residents and asylum seekers.
- Educational institutions and hospitals may find it difficult to comply with the new reporting requirements for foreign nationals.
- Its effective implementation will require strong coordination between immigration officers, airlines, universities, and security agencies.

Role of Audits in India

GS II – Powers, functions, and responsibilities of various constitutional bodies

Context: In 2023, only 18 audit reports on the Union government's accounts, prepared by the Comptroller and Auditor General (CAG), were tabled in Parliament.

Comptroller and Auditor General of India (CAG):

- It is a constitutional authority that heads the **Indian Audit and Accounts Department (IA&AD)**. The two entities are known as the **Supreme Audit Institution of India (SAI)**.
- The CAG is appointed by the **president of India** by a warrant under his hand and seal.
- He is provided with the security of tenure. He can be removed by the president only by following the procedure mentioned in the Constitution.
- The CAG holds the office for six years or until attaining the age of 65 years whichever is earlier.

Constitutional provisions related to the CAG:

- **Article 148** provides for an independent office of the CAG.
- **Articles 149-151 (Duties & Powers, Form of Accounts of the Union and the States and Audit Reports)**, **Article 279** (calculation of net proceeds, etc.), and **Third Schedule** (Oath or Affirmation), and **Sixth Schedule** (Administration of Tribal Areas in the States of Assam, Meghalaya, Tripura, and Mizoram).

Status of CAG Report submitted in India:

- On average, **22 reports were tabled each year between 2019 and 2023**, compared to the 40 reports tabled between 2014 and 2018.

Provisions that provide independence for the functioning of the CAG:

- The CAG's salary and **expenses are charged to** the Consolidated Fund of India.
- CAG is provided with the **security of tenure** and does not hold office till the pleasure of the president, though he is appointed by him.
- Upon relinquishing the office, the **CAG is barred from holding any subsequent position within either the Government of India or any State Government**, maintaining the independence and integrity of the office.

Role/Significance of Audits in India:

- Audits instill **confidence in the public regarding how taxpayer money is utilized**, ensuring transparency in government operations.
- **Audits** hold government bodies and officials accountable for their financial decisions and actions, preventing misuse or misallocation of public funds.

- Audits help uncover **errors, discrepancies, or potentially fraudulent activities**, ensuring corrective actions are taken promptly.
- **Audits** verify if financial activities align with budgetary allocations, preventing overspending or unauthorized expenditures.
- Audits highlight inefficiencies in processes, allowing for improvements and **cost-saving measures**.
- **Audits** assess the effectiveness of government programs and initiatives, **guiding future policy decisions for better outcomes**.
- Audit reports provide valuable insights for policymakers, aiding in informed decision-making for better governance.
- Audits meeting global standards improve the country's standing in international financial communities, facilitating collaborations and partnerships.

Rhodamine B

GS II – Health

Context: Recognising its potential dangers, many countries have put in place strict regulations on the use of Rhodamine B.

Rhodamine B:

- It is a colouring agent commonly used in the textile, paper, and leather industries. The colourant is **low-cost and is sometimes used to give vibrant hues** to popular street food items such as gobi manchurian and cotton candy.
- The dye is not fit for consumption and may lead to acute toxicity. Exposure to the chemical may also damage the **eye and cause irritation in the respiratory tract**.
- While the **World Health Organisation**, which maintains a list of cancer-causing agents, says it cannot be classified as carcinogenic to humans, there are **some studies on rats that have shown carcinogenic effects**.
- It is not commonly added to food products but is usually reported from small roadside vendors in small cities. This is because of a **lack of understanding about dyes** that are permissible in food items. Small vendors are **not aware that this dye can be harmful as its effects might not always be felt immediately**.
- It is usually “illegally” **added to preparations such as gobi manchurian**, potato wedges, butter chicken, pomegranate juice, ice creams produced on a small scale, or cotton candies.
- **Food Safety and Standards Authority of India (FSSAI)** has specifically banned **Rhodamine B** from being used in food products. Any use of this chemical in the preparation, processing, and distribution of food is punishable **under the Food Safety & Standards Act, 2006**.

Food colours allowed by the Food Safety Act of 2006:

- **It includes the following natural food colours:**
 - **Carotene and Carotenoids (yellow, orange)** are natural pigments found in many fruits and vegetables, such as carrots, pumpkins, and tomatoes. They are responsible for the yellow, orange, and red colours in these foods.
 - **Chlorophyll (green)** is the pigment responsible for the green colour in plants. It is commonly used as a natural food colouring agent.
 - **Riboflavin (yellow)** also known as vitamin B2, is a yellow-coloured compound found in various foods. It is sometimes used as a food colouring agent.
 - **Caramel** is a natural food colouring agent derived from the heating of sugar. It can range in colour from pale yellow to deep brown, depending on the degree of caramelization.
 - **Annatto (orange-red)** is a natural food colouring derived from the seeds of the achiote tree. It imparts a vibrant orange-red colour to foods and is commonly used in cheese, butter, and other dairy products.
 - **Saffron** is a spice derived from the **flower of the Crocus sativus plant**. It is known for its intense yellow colour and is one of the most expensive spices in the world.
 - **Curcumin (yellow from turmeric)** is the main active compound found in turmeric. It is responsible for the yellow colour of this spice and is used as a natural food colouring agent.
- **It includes the following synthetic colours:**

- **Ponceau 4R** is a synthetic red colour commonly used in various food and beverage products.
- **Carmoisine** is a synthetic red colour often used in food colouring.
- **Erythrosine** is a synthetic red colour commonly used in food colouring, especially in sweets and candies.
- **Tartrazine and Sunset Yellow FCF** are synthetic yellow colours widely used in various food products.
- **Indigo Carmine and Brilliant Blue FCF** is a synthetic blue colours used in food colouring.
- **Fast Green FCF** is a synthetic green colour used in food products.
- Even permissible food colourings, however, are not allowed in all food items. Some food items that can **use these colours include ice creams, biscuits, cakes**, confectioneries, fruit syrups and crushes, custard powder, jelly crystals, and carbonated or noncarbonated beverages.

Food Safety and Standards Authority of India (FSSAI):

- It is an autonomous statutory body established under the Food Safety and Standards Act, of 2006. It **aims to establish a single reference point for all matters relating to food safety** and standards, by moving from multi-level, multi-departmental control to a single line of command.
- It is responsible for protecting and promoting public health by regulating and supervising food safety and quality in India, operating under the Ministry of Health & Family Welfare.
- It has a headquarters in New Delhi and regional offices in eight zones across the country.
- The Chairperson and Chief Executive Officer of FSSAI, appointed by central government.

Role of Speaker in Anti-Defection Law

GS II – Parliament and State Legislatures—Structure, Functioning, Conduct of Business, Powers and Privileges and Issues Arising out of these.

Context: There are numerous instances in the history of Parliament and State Assemblies where Members of Parliament (MPs) or Members of the Legislative Assembly (MLAs) have been disqualified by the Speaker under the anti-defection law.

Anti-Defection Law:

- The 52nd Amendment Act of 1985 added a new Schedule i.e. Schedule 10 to the Indian Constitution that provided for the disqualification of the members of Parliament and state legislatures on the ground of defection from one political party to another. This act is often referred to as the 'anti-defection law'.
- Later, the 91st Amendment Act of 2003 omitted an exception provision i.e., disqualification on the ground of defection not to apply in case of split.

Disqualification on Grounds of Defection under the Tenth Schedule:

- If an elected member willingly gives up his membership in a political or legislative party.
- If he votes or refrains from voting in such a house, opposed to any guidance issued by his political party or anyone approved to do so, without getting prior permission.
- As a pre-condition for his disqualification, his refraining from voting must not be tolerated by his party or the authorized person within 15 days of such incident.
- If any independently elected member joins any legislative party.
- If any nominated member joins any political party post the expiry of six months.

Exceptions:

- There will be no disqualification of members if one-third members of the legislature party split to form a separate group. However, this provision was deleted by the 91st Amendment in 2003.
- The law permits mergers of political parties when two-thirds of the members of a legislative party agree to merge with another party. In these instances, legislators are not considered to have defected.

Role of Speaker in Anti-Defection Law:

- The final assessor in the case of disqualification under the Tenth Schedule lies in the hands of the speaker of the house. The speaker or presiding officer is regarded as the custodian of the process of democratic rules in the parliament and the state assemblies.
- The standing of the speaker is very high as he is placed next to the President, the Vice-President, and the Prime Minister. The speaker can debar a member only if an allegation of disqualification is placed before him under Para 2 of the Tenth Schedule.
- Under the light of Articles 102 and 191 of the Constitution and the Tenth Schedule, the speaker's exercise is judicial, as he can make a judgment only after a member files a disqualification petition.

Is the decision of the Presiding Officer subject to Judicial Review?

- The act provided that the presiding officer's ruling was ultimate and could not be interrogated in any court of law. But, in the *KihotoHollohan* case (1992), the Supreme Court stated this provision as unconstitutional on the basis that it seeks to take away the authority of the Supreme Court and the High Courts. The court specified that while deciding on an issue under the 10th Schedule, the presiding officer must function as a tribunal. Therefore, his/her ruling (similar to other tribunals) was subject to judicial evaluation on the grounds of malafides, perversity, etc.
- However, the court dismissed the argument that the vesting of adjudicatory powers in the presiding officer is by itself void on the grounds of political bias. However, it specified that there shall not be any judicial involvement until the Presiding Officer has given his order.

KihotoHollohan vs. Zachillu and others the case of 1992:

- The Supreme Court stated that judicial review cannot be carried out at a stage before the making of a decision by the speaker or chairman, and no intervention would be allowed at an interlocutory stage of the trials carried by the speaker or chairman. However, before this case, the verdict of the speaker or chairman was considered final and was not subject to judicial evaluation. This provision was regarded as unconstitutional by the Supreme Court.

World Health Organization (WHO)

GS II – International Institution

Context: United States President Donald Trump signed an executive order to withdraw from the World Health Organisation (WHO) on his very first day in office.

World Health Organization (WHO):

- It was established in 1948 and is the United Nations agency that connects nations, partners, and people to promote health, keep the world safe, and serve the vulnerable – so everyone, everywhere can attain the highest level of health.
- It leads global efforts to expand universal health coverage by directing and coordinating the world's response to health emergencies.
- It currently has 194 member states.
- **World Health Assembly (WHA)** is the highest decision-making body of WHO that comprises representatives from all member states.
- **The WHA is headed by the director-general** who is supported by a senior management team. The WHA meets annually to set policies, approve the budget, and elect the director-general.
- **The secretariat** is responsible for carrying out the policies and programs approved by the WHA.
- It has six regional offices that include Africa, America, **Southeast Asia**, Europe, the Eastern Mediterranean, and the Western Pacific.
- WHO gets its funding from two main sources:
 - **Assessed contributions** are the dues countries pay to be a member of the organization.
 - **Voluntary contributions** are from member states, or other partners like United Nations Organizations, intergovernmental organizations, philanthropic foundations, the private sector, etc.

Significance/Role of WHO in global health governance:

- It helps countries to address health challenges effectively by **setting global health standards and guidelines**.
- **It monitors and assesses global health trends by** providing updates on emerging health issues and disease outbreaks to help countries prepare and respond.
- **It coordinates international health responses by working** with governments, other UN agencies, and international partners to coordinate global health responses to epidemics, disasters, and other health emergencies.
- **It supports** countries in strengthening their health systems, which includes improving access to essential medicines, training health workers, and developing health infrastructure.
- **It conducts and promotes** research into global health issues, with a focus on finding solutions to health challenges affecting low- and middle-income countries
- **It advocates** for policies and funding that prioritize global health issues and ensure that health is a central component of development agendas.

Issues/Challenges faced by WHO:

- It relies heavily on voluntary funding from member states and other donors, which is unpredictable and insufficient to fully fund its programs.
- It does not adequately represent the interests of all member states, particularly developing countries.
- **Its resources can be strained due to the need for** constant monitoring of new and emerging diseases.
- **It is slow** in responding to health crises due to its bureaucratic structure and lack of resources.
- Many countries still lack adequate healthcare infrastructure and resources, which makes it difficult for WHO to improve health outcomes in these areas.
- It faces the challenge of dealing with the health consequences of extreme weather events and the health effects due to climate change.
- **It faces** criticism due to a lack of transparency in its decision-making and operations.

Reasons for U.S. Withdrawal from WHO:

- The U.S. accused WHO of delayed response and inadequate measures in the early stages of the pandemic. WHO declared COVID-19 a Public Health Emergency of International Concern (PHEIC) on January 30, 2020, but faced criticism for relying on incomplete information from China.
- It has been alleged that WHO favoured China, undermining its impartiality. WHO praised China's transparency, despite concerns about suppressed early reports of human-to-human transmission.
- U.S. criticized WHO for resisting structural reforms to improve governance and accountability.
- The U.S. accounted for 22.5% of assessed contributions (\$138M) and 13% of voluntary contributions (\$356M in 2023), while China's voluntary contribution was just 0.14% (\$3.9M), amplifying U.S. concerns about inequitable burden-sharing.

Impact of US withdrawal from WHO:

- The U.S. contributed 22.5% of assessed contributions (\$138M) and 13% of voluntary contributions (\$356M in 2023), amounting to ~20% of WHO's budget. The loss of funding threatens global health initiatives undertaken by WHO.
- Major health programs, including those for tuberculosis, polio, and malaria, face potential delays or halts.
- U.S. expertise, including contributions from agencies like the CDC, is critical for technical guidance and health policy frameworks.
- Reduced resources and expertise weaken WHO's ability to coordinate global responses to health emergencies.
- U.S. withdrawal undermines collective global action and fosters geopolitical divisions in health governance.

PAPER 3

Agriculture in the Union Budget 2025-26

GS III –Agriculture in the Union Budget 2025-26

Context:Emphasizing ‘Agriculture as the first engine’ for India’s development journey, Union Budget 2025-26 tabled in Parliament by Union Minister for Finance and Corporate Affairs Smt. Nirmala Sitharaman, announced a slew of measures to spur Agricultural Growth and Productivity, thereby benefitting the Annadata.

Agriculture-Related Findings of Economic Survey 2024-25:

- The agriculture sector grew at 5% annually (2016-23), with GVA share rising from 24.38% (2014-15) to 30.23% (2022-23).
- The fisheries sector had the highest growth rate (13.67%), followed by livestock (12.99%) between 2013-14 and 2022-23, while oilseeds grew slowly at 1.9%.
- Irrigation coverage increased from 49.3% (2015-16) to 55% (2020-21) of Gross Cropped Area (GCA), while irrigation intensity rose from 144.2% to 154.5%.

Agricultural Initiatives Announced in the Union Budget 2025-26:

- **National Mission on High-Yielding Seeds** aims to improve agricultural productivity by developing high-yielding seeds that are more resilient to pests and climate stress. It focuses on developing new seed varieties with better productivity and resistance, creating seeds resilient to pests and climate stress, and ensuring easy access to high-yielding seeds for farmers.
- **A Makhana Board** will be established in Bihar to boost production, processing, and marketing, and support farmers through FPOs and government schemes.
- **The central government will establish a National Institute of Food Technology, Entrepreneurship, and Management in Bihar to promote food processing activities in Eastern India.**
- The second Gene Bank would be set up for future food and nutritional security with 10 lakh germplasm lines.
- It has planned a five-year mission for improvements in productivity and sustainability of cotton farming and promotes extra-long-staple cotton varieties.
- The government will create a sustainable fisheries framework for the EEZ and High Seas, focusing on Andaman & Nicobar and Lakshadweep Islands.
- **Prime Minister Dhan-Dhaanya Krishi Yojana** aims to enhance agricultural productivity in 100 low-productivity districts, focusing on crop diversification, sustainable practices, improved storage, irrigation, and credit availability, benefiting 1.7 crore farmers.
- A 6-year mission for self-reliance in pulses will be launched to achieve self-sufficiency in pulse production, focusing on crops like Tur, Urad, and Masur.
- **Rural Prosperity and Resilience Programme** is a multi-sectoral initiative to address under-employment in agriculture through skilling, investment, technology, and rural empowerment. It prioritizes rural women, young farmers, and small farmers, aiming for job creation, financial independence for women, and agricultural modernization.
- **Public Sector Banks will develop the ‘Grameen Credit Score’** framework to serve the credit needs of SHG members and people in rural areas.
- **The loan limit under the Modified Interest Subvention Scheme** increased from Rs 3 lakh to Rs 5 lakh for **Kisan Credit Cards (KCC)** holders supporting around 7.7 crore farmers, fishermen, and dairy farmers.

Banking Sector

GS III – Banking

Context:In recent times, there has been a noticeable resurgence in India's banking system following almost a decade of grappling with escalating bad loan challenges.

Current Status of the Indian Banking Regime:

- In FY23, the gross non-performing assets (**NPA**) ratio for banks in India plummeted to 4.41%, the lowest since March 2015. It is due to the **4R strategy**—Recognizing NPAs transparently, Resolution and recovery, **Recapitalization** of
- **PSBs**, and **Reforms** in the financial ecosystem.
- A recent investigation (by The Indian Express) revealed that a staggering 43% of total NPAs as of March 2019 - amounting to ₹4.02 lakh crore - was owed by just 100 companies.

Challenges faced by the Indian Banking Sector and ways to address it:

- Bank lending for upcoming **infrastructure** and capital investments, particularly those linked to State government entities, poses a **risk of defaults due to stretched State finances**. Banks are advised to set internal exposure limits based on fiscal/financial assessments of individual States.
- The seemingly runaway **stock market**, creating an illusion of wealth, presents a risk to retail exposures. Increased demat accounts and high PE ratios across sectors are indicators of this risk. Integrated supervision and rigorous stress tests on retail portfolios are recommended to address this emerging risk.
- The possibility of default becoming a contagion due to interconnected lending and **lax governance** norms poses a significant challenge. Focused risk monitoring is necessary, emphasizing that regulation cannot substitute for good governance.
- The re-globalization of the world and geopolitical shifts may challenge Small **and medium-sized enterprises (SMEs)**, especially in the face of **Free Trade Agreements (FTAs)** and regional ambitions. Banks need to carefully assess and prepare for potential risks to SMEs, considering potential disruptions to cash flows.
- The character of liabilities is changing with digitization and evolving consumption trends, impacting retail deposits. Banks with higher credit-deposit ratios may face challenges in liquidity coverage. A **structural shift** in Indian savings requires caution and prudence from bankers, necessitating careful watch amidst favourable conditions.

Way Forward:

- The **Narasimhan Committee Report (1991)** underscored the importance of India having **three or four prominent commercial banks** with a presence both domestically and internationally, in addition to foreign banks. The second tier could include numerous mid-sized banks, including niche institutions, with a widespread presence across the economy. Consistent with these suggestions, the government has already consolidated certain PSBs and taken measures to establish entities like a **Development Finance Institution (DFI)** and a **Bad Bank**.
- It could be beneficial for Distinctive Banks to consider listing on a reputable stock exchange and embracing the **ESG (Environmental, Social Responsibility, and Governance) framework**. This approach aims to enhance value for stakeholders over the long term.
- Enhanced risk management can be achieved, and neo-banks have the opportunity to harness this technology for advancing digital financial inclusion and supporting the increased growth of an aspiring and emerging India. In the realm of Indian banking, the implementation of technologies such as **Blockchain** holds the potential to facilitate prudential supervision, making oversight and control over banks more streamlined.
- Development and implementation **of internal risk models** tailored to individual States, similar to the **Bank Exposure Risk Index**, to assess potential risks associated with lending to State government entities and infrastructure projects.

Evolution of the banking sector in India:

- **First Generation Banking:** In the period before Independence (up to 1947), the **Swadeshi Movement** led to the establishment of numerous small, local banks, most of which faced failure primarily due to internal frauds, interconnected lending, and the amalgamation of trading and banking activities.
- **Second Generation Banking (1947-1967):** Indian banks enabled the consolidation of resources, mobilised through retail deposits, towards a limited number of business families or groups, consequently overlooking

the flow of credit to the agriculture sector.

- **Third Generation Banking (1967-1991):** The government successfully severed the link between industry and banks by **nationalising 20 major private banks in two phases (1969 and 1980)** and introducing **priority sector lending** in 1972. These measures led to a **transition from 'class banking' to 'mass banking'** and had a favorable effect on the widespread expansion of branch networks in rural India, substantial mobilization of public deposits, and increased credit flow to **agriculture and allied sectors**.
- **Fourth Generation Banking (1991-2014):** During this period, significant reforms were implemented, including the issuance of new licenses to private and foreign banks to introduce competition, improve productivity, and enhance efficiency. These changes involved leveraging technology, introducing prudential norms, offering operational flexibility with functional autonomy, prioritizing the implementation of best corporate governance practices, and fortifying the capital base following **Basel norms**.
- **Current Model:** From 2014 onward, the banking sector has embraced the **JAM (Jan-Dhan, Aadhaar, and Mobile) trinity**, and granted licences to **Payments Banks** and **Small Finance Banks (SFBs)** to attain last-mile connectivity in the pursuit of financial inclusion.

Economic Contribution of Southern States

GS III – Mobilization of Resources

Context: Chief Economic Adviser (CEA) V. Anantha Nageswaran said it is about time that the Southern States benchmark themselves against the world and not just India, as the region is leading in many of the parameters when compared with the rest of the country.

Development Statistics of India's Southern States:

- The southern states like Tamil Nadu, Karnataka, Kerala, Andhra Pradesh, and Telanganac contribute to **over 30%** of India's GDP.
- **Tamil Nadu** and **Karnataka** have high compounded annual growth rates in Gross State Domestic Product (GSDP).
- The southern region registers a **6.3% annual growth** in real terms, compared to a 5% annual growth for the rest of India.
- **Per capita GDP growth** in Southern states is **5%**, higher than the 4.2% recorded in other parts of the country.
- Southern states have maintained **per capita income over the national average per capita income**, since 1991.
- Southern states fare better in terms of **Average Labour Force Participation Rate**.
- South contributes significantly to **Gross Value Added (GVA)** across multiple sectors, including real estate, agriculture, allied services, manufacturing, and services
- Southern region accounts for:
 - 37.4% of total factories in India
 - 37% of factories in operation
 - 25.6% of fixed capital investments.

Reasons for Southern States Outperforming the Rest of India:

- The southern states have experienced relative stability which enabled consistent economic and cultural development, with major trade centers like Vijayanagaram, Kanchipuram, Madurai, Mahabalipuram, Kochi, and Kozhikode, unlike the north's repeated foreign invasions.
- During the colonial rule, Madras and Bombay had emerged as major Presidency towns in the south, while the north had only one i.e. Calcutta by the mid-18th century,
- Southern states outpaced northern states in economic growth post-LPG reforms, attracting more industrial investment and FDI.
- Southern states like Tamil Nadu and Karnataka have higher agricultural productivity due to the adoption of modern farming techniques and diversified into cash crops, horticulture, and aquaculture whereas northern states like Uttar Pradesh and Bihar relied heavily on traditional crops like wheat and rice, leading to stagnation in productivity.
- Southern states have introduced IT and e-governance reforms that boosted their economies.

- Southern states controlled population growth post-independence which enabled better resource allocation for development.
- Southern states excel in healthcare, with Kerala having the best infrastructure and low infant mortality. Even the Maternal Mortality Ratio in Southern India is lower than the national average.
- Southern states have benefited from proximity to ports that boost trade, and exports, and enhance industrial growth.

Issues/Concerns Regarding the Southern States' Economic Growth:

- There is a productivity gap in manufacturing as the southern region contributes only 26% to the total manufacturing output.
- The region has a strong Skill Level 2 workforce (intermediate skills) but lags in Skill Levels 3 and 4 (advanced professional skills in AI, engineering, and high-tech sectors).
- The declining demography in southern states, worsened by emigration for better opportunities, risks labour shortages, highlighting the need for an inclusive migrant policy to sustain growth.
- They face challenges related to urban congestion as there is a need for better industrial corridors, logistics networks, and digital infrastructure to attract more global investments.
- States like Tamil Nadu and Karnataka lead in economic growth, while others like Andhra Pradesh and Telangana face slower industrialization leading to regional disparities.
- Southern states are highly vulnerable to climate change, with frequent droughts, cyclones, and extreme weather events that push agriculture and coastal economies at risk.

Drones for Defence

GS III – Developing New Technology

Context: Cracking the whip against domestic private sector companies that are using Chinese components in drones being supplied to the armed forces, the defence establishment has now scrapped three contracts for the induction of 400 logistics drones by the Army.

Significance/Need for drones for defence:

- They are used to identify enemy positions, assess the terrain, and track movements.
- They are equipped with precision-guided munitions, which can be used to target enemy positions.
- They are used to locate and rescue personnel in hazardous or inaccessible areas.
- They are faster and easier to deploy as they provide operational flexibility.

Government initiatives to promote drones:

- Drone Shakti scheme for institutionalizing and creating a framework where multiple stakeholders can work together.
- Production Linked Incentive (PLI) scheme for drones and drone components.
- India's Drone Rules 2021 to help start-ups and small and medium-sized enterprises.
- India has imported drone technology from various countries like the US and Israel. **Heron Mark-II drones are Medium Altitude Long Endurance (MALE) UAVs**, inducted by Indian Air Force to carry out surveillance along Northern borders with Pakistan and China.
- **Searcher Mk II drones** were developed by Israel Aerospace Industries, it is a reconnaissance drone used by the Indian army and navy.
- **Drone, Detect, Deter, and Destroy (D4 System)** is an indigenous anti-drone system developed by DRDO, and inducted into the Indian Armed Forces.

Autonomous Flying Wing Technology Demonstrator:

- It is an indigenous high-speed flying-wing Unmanned Aerial Vehicle (UAV). It has a tailless fixed-wing aircraft that houses its payload and fuel in its main wings.
- It is a scaled-down version of its futuristic unmanned combat aerial vehicle.
- It is designed and developed by DRDO's Aeronautical Development Establishment.

Significance:

- It allows take-off and landing from any runway with surveyed coordinates (using GPS Aided GEO Augmented Navigation (GAGAN)).
- India joined the elite club to master the flying wing technology.
- It can be employed as a covert stealth combatdrone.

Digital Monopoly

GS III – IT and Computers

Context:The Ministry of Electronics and Information Technology (MeitY) has expressed strong opposition to Google's delisting of certain applications from the Play Store.

Digital Monopoly:

- It refers to a situation where a single company or platform holds significant control over their respective digital ecosystems and markets.
- Its examples include big tech companies like Google, Amazon, Facebook, Apple, and Microsoft.

Threats Posed by Digital Monopolies:

- Exclusionary behaviour hinders business users and consumers from switching to third-party service providers. E.g., App stores mandating the use of their payment systems.
- A digital enterprise according to the favourable treatment of its products on its platform, thus creating a conflict of interest.
- Combining or bundling core or essential services with complementary offerings, thus forcing users to buy related services.
- Using personal data for consumer profiling to offer targeted online services and products, thus raising data privacy concerns.
- Predatory pricing strategies, or intentionally setting prices below cost price to exclude competitors.
- Exclusive agreements with business users or sellers, thus preventing them from dealing with other enterprises. E.g., Apple restricts installation of third-party applications on iPhones.

India's Initiatives to Prevent Digital Monopolies:

- Consumer Protection (E-Commerce) Rules of 2020 were introduced to govern the operations of e-commerce platforms and digital marketplaces. These rules aim to prevent anti-competitive practices, ensure transparency, and protect consumer interests.
- The Competition (Amendment) Act of 2023 introduced new merger notification thresholds and deal value thresholds to capture acquisitions of high-value, data-rich firms that can potentially lead to digital monopolies.
- The Competition Commission of India (CCI) also investigates and takes action against anti-competitive practices by digital platforms.
- The Digital Personal Data Protection Act of 2023 emphasizes the importance of data to prevent the concentration of data in the hands of a few dominant players.
- The proposed Digital India Act (DIA) proposes to regulate a vast array of digital enterprises including social media websites, artificial intelligence-based platforms, and e-commerce enterprises.
- Draft National Data Governance Framework Policy aims to create standardized data management and security for non-personal and anonymised data across all government bodies.

Way Forward:

(It is based on the recommendations of the Committee on Digital Competition Law of 2024)

- Introduction of a Digital Competition Act with ex-ante measures (using a form of financial analysis that uses forecasting for future events as against the prevailing practice of ex-post framework in most cases).
- Identification and designation of certain large digital platforms as Systemically Important Digital Intermediaries' (SIDIs). They would be subject to ex-ante regulations and obligations.
- Introduction of a deal value threshold and the consideration of non-price factors like data and innovation in merger assessments.
- Strengthening the Competition Commission of India (CCI) by enhancing the institutional capacity and expertise to effectively deal with competition issues in the digital domain.
- Better coordination among various regulatory authorities, such as the CCI, the Telecom Regulatory Authority of India (TRAI), etc.
- Increased international cooperation and alignment with global best practices in digital competition regulation.

Chandrayaan - 3

GS III – Space Technology

Context: A study by scientists of the Indian Space Research Organisation (ISRO) has estimated the age of the region where the Chandrayaan-3 landed on the moon is located to be 3.7 billion years — an age that coincides with the period when primitive microbial life first emerged on Earth.

Chandrayaan-3 Mission:

- Chandrayaan-3 is a follow-on mission to Chandrayaan-2 (2019) to demonstrate ISRO's end-to-end capability in safe landing and roving on the Moon's surface.
- It comprises an indigenous propulsion module, a lander module (called Vikram), and a rover (called Pragyaan) to develop and demonstrate new technologies required for inter-planetary missions.

Objectives of Chandrayaan-3:

- To demonstrate a safe and soft landing on the lunar surface
- To demonstrate rover roving on the moon
- To conduct in-situ scientific experiments

Components of Chandrayaan-3 Mission:

- It consisted of two modules - the **propulsion module (PM)** and the **Lander module (LM)**.
- The **main function** of the **Propulsion Module (PM)** is to carry the **lander Module (LM)** from launch vehicle injection to the final lunar 100 km circular polar orbit, where the LM separates from the PM.

It carried the following subsystems:

- **Radio Anatomy of Moon Bound Hypersensitive Ionosphere and Atmosphere (RAMBHA)** measures the near-surface plasma (ions and electrons) density and its changes with time.
- **Chandra's Surface Thermo Physical Experiment (ChaSTE)** to carry out the measurements of thermal properties of the lunar surface near the polar region.
- **Instrument for Lunar Seismic Activity (ILSA)** measures seismicity around the landing site and delineates the structure of the lunar crust and mantle.
- **Laser Retroreflector Array (LRA) Rover** is a passive experiment to understand the dynamics of the Moon system.
- **Alpha Particle X-Ray Spectrometer (APXS)** to determine the elemental composition (Mg, Al, Si, K, Ca, Ti, Fe) of Lunar soil and rocks around the lunar landing site.

SHOOTING FOR THE MOON: 2019, 2023

CHANDRAYAAN-2

COMPONENTS
Orbiter, Lander, Rover

EXPERIMENTS ON BOARD
■ 8 on Orbiter, 4 on Lander, 2 on Rover

WEIGHT
Orbiter: 2,379 kg
Lander: 1,471 kg
Rover: 27 kg (travels 500 m)
Payload total: 3,850 kg

MISSION LIFE
ORBITER: Planned 1 year, estimated 7 years
LANDER, ROVER: 11 lunar day

LANDING SITE
70.9 degree S 22.7 degree E; high plain between two craters, Manzinus C and Simpelius N

DAYS TO MOON
Around Earth: 23 days
Towards Moon: 7 days
Around Moon: 13 days
Lander separation, de-boosting, powered descent: 5 days
TOTAL: 48 DAYS

LANDER
5 thrusters; was to land in a 500 m X 500 m space; was using pictures taken then and there to assess landing site.

CHANDRAYAAN-3

COMPONENTS
Propulsion module, Lander, Rover

EXPERIMENTS ON BOARD
■ Same experiments on Lander and Rover as Chandrayaan-2
■ New experimental payload added to propulsion module


WEIGHT
Propulsion module: 2,145 kg
Lander: 1749.86 kg (including rover)
Rover: 26 kg
Payload total: 3,900 kg

MISSION LIFE
PROPULSION MODULE: 3 to 6 months
LANDER, ROVER: 1 lunar day

LANDING SITE
69.36 degree S, 32.34 degree E; slightly off the site for Chandrayaan-2

DAYS TO MOON
42 DAYS; SOONER THAN CHANDRAYAAN-2

LANDER
4 thrusters; stronger legs; built with redundancies for more scenarios, using data already generated by the C2 orbiter. Additional solar panels.



Isro's LVM3 carrying Chandrayaan-3 being moved to the launch pad ahead of its launch, at the Satish Dhawan Space Station, in Sriharikota. PTI

- **Laser-Induced Breakdown Spectroscopy (LIBS) Propulsion Module to perform** qualitative and quantitative elemental analysis & to derive the chemical composition and infer mineralogical composition to further our understanding of the Lunar surface.

Significance of Chandrayaan-3:

- It provided India a leadership in space technology as India joined the elite group of nations - Russia, the US, and China by demonstrating lunar soft-landing capability.
- The demonstrated soft landing capability by Chandrayaan-3 holds strategic importance for India with applications extending to standard refueling and docking technology enabling interplanetary science missions.
- The reusable launch vehicle technology derived from the mission aids in cost reduction for future launches.
- The technologies used in Chandrayaan-3 translate into strategic tools and commercial products that have applications in disaster management and infrastructure monitoring.

Shiv Shakti Point on Moon:

- It is located at 69.373°S 32.319°E, between the lunar craters Manzinus C and Simpelius N.
- The term 'Shiv Shakti' represents nature's masculine-feminine duality, embodying strength and resolution, and has a deep connection to India's diverse cultural environment.

Care Economy in India

GS III –Indian Economy

Context: India is set to supply 100,000 care workers annually to the global labour market for the next two years as it prepares to provide a skilled workforce to advanced countries seeing a decline in their working-age population due to ageing, said the chief executive officer (CEO) of the National Skill Development Corporation (NSDC).

Care Economy:

- It refers to the sector of economic activity that encompasses the provision of care and support services, particularly those related to health, education, childcare, eldercare, and other forms of social care.
- It encompasses **paid and unpaid care work** crucial for human survival, welfare, and labour force reproduction.
- It contributes to meeting **material, emotional, and developmental needs** but is often unrecognized or undervalued, leading to a "**hidden care economy**".
- It is different from the Monetized Economy, which is the **formal market-based system** where goods and services are bought and sold using money.
- It encompasses industries like **manufacturing, technology, healthcare (formal sector), and retail**.
- The value of work in the monetized economy is directly tied to its market price.
- Historically, feminist economists have critiqued the conventional definition of "**work**" for excluding **unpaid labour**, particularly the significant contributions made by women within households. This challenge led to the **Beijing Platform for Action in 1995**, which advocated for recognizing and valuing women's roles in caregiving, domestic work, and volunteerism.

Challenges/Issues Related to the Care Economy in India:

- Existing policies related to the care economy, such as **maternity benefits and childcare leave**, often have limited coverage and applicability, particularly in small-scale enterprises and the informal sector.

The **Maternity Benefit Act, of 1961** applies only to establishments with **10+ employees**. **98%** of Indian enterprises are "micro" with less than 10 workers, as per the Economic Census data. This leaves many women without adequate support or protection in balancing work and caregiving responsibilities.

- The unequal burden of care work often **hinders women's workforce participation** and career advancement opportunities. The **Female Labour Force Participation Rate** in India was **37% in 2023**, according to PLFS 2022-23. Despite this improvement, it remains below the desired level. Many women are forced to prioritize caregiving over paid employment, leading to a lower representation of women in **formal sectors and decision-making roles**.
- Access to affordable and quality care services, such as **childcare facilities and eldercare support**, remains a challenge in many parts of India. Limited availability and high costs of care services further exacerbate the caregiving burden on families, especially for low-income households. It estimates that women's unpaid care and domestic work represent almost **15%-17% of India's GDP**.
- Societal expectations and cultural norms often reinforce the perception that caregiving is primarily a woman's responsibility. This stigma prevents men from actively participating in caregiving duties and **perpetuates the cycle of unequal distribution of care work** within households.

Way Forward:

- **Implement the 3R Framework.** –
 - **Recognize** the extensive childcare responsibilities currently borne by mothers.
 - **Reduce** the load on mothers through redistribution of childcare within households by greater involvement of fathers and outside households through affordable, quality neighbourhood childcare options
 - **Redistribute** childcare as a social responsibility, not just an individual burden on mothers.
- Create a national framework to **recognize the skills gained through unpaid care work**. This could involve issuing micro-credentials that validate competencies in childcare, eldercare, or household management. These credentials could enhance employability for caregivers who re-enter the paid workforce. Offer training programs to help caregivers further develop their skills and potentially transition into paid caregiving roles.
- The **International Labour Organisation (ILO)** suggests that increasing investments in the care services sector have the potential to generate **475 million jobs globally by 2030**. Presently, India's public spending on the care economy is **less than 1% of GDP**, relatively low in comparison with other nations. For India, **direct public investment equivalent to 2% of GDP** can potentially generate 11 million jobs, nearly 70% of which will go to women. India can also learn from **Japan's 'womenomics' reforms**.
- Leveraging technology to create online platforms that connect caregivers with resources and support services. These platforms could offer information on childcare options, eldercare facilities, or training programs.
- Encouraging partnerships between the **government, private sector, and NGOs** to develop innovative solutions for affordable and accessible care services. This could **involve tax breaks for companies that offer childcare facilities** for employees or support for social enterprises working in the care sector.
- Promote **corporate social responsibility initiatives** that support the care economy. This could involve companies sponsoring childcare centers in low-income communities or offering flexible work arrangements for employees with caregiving responsibilities.

Note:

- **Paid Care Work** refers to care jobs in sectors like **health, education, personal care, and domestic work** that are compensated. Women are overrepresented in care roles like **nurses, domestic workers, personal carers, teachers**, and childcare assistants.
- **Unpaid Care and Domestic Work** include **domestic services** (cooking, cleaning), **caregiving** (children, elderly, sick), and community/voluntary services. Under this, direct care involves dependents, while indirect care includes domestic tasks, and multitasking blurs these boundaries.
- **Care Diamond** represents the four main actors in care provision - State, markets, households, and communities.

Gender Budgeting

GS III – Budget

Context: The share of Gender Budget allocation in the total Union Budget has increased to 8.86% in FY 2025-26 from 6.8% in FY 2024-25.

Gender Budgeting:



- It is a strategic tool used by governments to allocate resources efficiently based on the distinct needs of different genders.
- **Gender budgeting involves:**
 - Gender-sensitive formulation of legislation, programmes, and schemes.
 - Gender-based allocation of resources.
 - Monitoring of expenditure and public service delivery from a gender perspective.
 - Audit and impact assessment of programmes and schemes on

women.

- Follow-up corrective action to address gender disparities.

Significance of Gender Budgeting:

- It acts as a powerful tool for achieving gender mainstreaming to ensure that the benefits of development reach women as much as men.
- It recognizes the need for affirmative action to address the specific needs of women.
- It sensitizes the government and society towards discrimination and gaps between women and men in a given sector.
- It can contribute to achieving the objectives of gender equality, human development, and economic efficiency.
- It leads to more focus on issues of women's inequality and empowerment and thereby leads to more specific allocation of such schemes.
- It leads to increased focus on education, health, and safety of women. For example, Beti Bachao, Beti Padhao have resulted in an increased child sex ratio in vulnerable areas.
- It increases focus on women's health through policies and schemes. For example, Janani Suraksha Yojana, Maternity Benefit Act 2016, etc.

Challenges Faced by Gender Budgeting in India:

- The unclear methodology for assigning funds to gender-sensitive schemes often results in discrepancies, such as the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) being underreported in Part B despite its significant female workforce.
- Its impact is confined to a few sectors as 90% of the gender budget is concentrated in just a few ministries, with schemes like Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY), MGNREGS, and PMAY-G.
- It hinders real-time women empowerment due to the inclusion of long-term schemes like Ayushman Bharat and Awas Yojana in gender budgeting diverts funds from immediate-impact programs such as Mission Shakti and female education.
- It suffers from inadequate tracking mechanisms, poor quality of gender impact assessments, and a lack of gender-segregated data that hinder the accurate assessment of needs and outcomes.
- It may not always align with political priorities, resulting in insufficient support.

Key Highlights of the Gender Budget Statement (GBS) of 2025-26:

- GBS of 2025-26 is India's largest-ever gender budget, boosting women's welfare, education, and economic empowerment, with 49 ministries reporting gender-specific allocations.
- The Gender Budget for FY 2025-26 is Rs 4.49 lakh crore (8.86% of total Union Budget 2025-26), a 37.5%

increase from Rs 3.27 lakh crore in FY 2024-25.

- The Gender Budget has been categorized into three parts.

Geospatial Intelligence

GS III – Awareness in the field of Space

Context: The government plans on initiating a National GeoSpatial Mission to develop foundational geospatial infrastructure and data.

Geospatial Intelligence:

- It is the collection and integration of data from a network of technologies, including satellites, mobile sensors, ground-control stations, and aerial images.
- The data is used to produce real-time maps and simulations to help identify when, where, and to what extent a threat is likely to emerge.
- Government officials, individuals or both can use this information to make informed decisions.

Significance of Geospatial Intelligence:

- The National Hurricane Center relies on geospatial intelligence to monitor cyclone location, formation, and trajectory. This information aids in resource allocation, issuing warnings, and managing evacuations.
- After the 7.8 magnitude earthquake in Turkey and Syria (February 2023), geospatial intelligence identified damage and helped locate survivors. It facilitated the establishment of aid stations and emergency supply distribution.
- It predicts climate-related events that help in anticipating and preparing for disturbances. This is crucial in addressing the increasing threats posed by climate change-induced extreme weather events.
- It plays a vital role in reporting critical information, such as Russian ground forces' movements in the Ukrainian conflict and infiltration into India from Pakistan.
- GPS technology and geospatial data enable efficient management of global supply chains. It provides governments and businesses with essential information on cargo movement.
- High-resolution imagery aids city planners in designing safer and more efficient communities.
- It supports the development of autonomous vehicles by providing ground-level details. Safer and smarter transportation systems are being built.
- Digital twins are virtual replicas of real systems, used for modeling and predicting outcomes. They have proven effective in conflict settings for simulating weather and terrain.

Issues/Challenges in Geospatial Intelligence:

- There is no demand for geospatial services and products on a scale linked to India's potential and size due to the lack of awareness among potential users in government and private.
- The unavailability of foundation data, especially at high resolution, is also a constraint. Essentially, foundation data can be seen as common data tables which are shared between multiple applications or processes which are supposed to create a sturdy foundation for good service automation and management.
- The lack of clarity on data sharing and collaboration prevents co-creation and asset maximization.
- There are still no ready-to-use solutions especially built to solve the problems of India.

Hindu Kush Himalayan (HKH) Region

GS III – Environmental Pollution and Degradation

Context: Hindu Kush Himalaya faces increased risks amid record glacier melting.

Hindu Kush Himalayan (HKH) Region:

- It spans an area of approximately 4.3 million square km in Afghanistan, Bangladesh, Bhutan, China, India, Myanmar, Nepal, and Pakistan.
- It is home to the world's highest peaks such as Mount Everest and Kanchenjunga.
- HKH is known as the Third Pole or the Water Tower of Asia because it holds the largest ice reserves outside of the polar regions.
- HKH with young and rising mountains is highly vulnerable to multiple hazards such as earthquakes and landslides.

Climatic Risks Faced by the Hindu Kush Himalayan (HKH) Region:

- Increased intensity and frequency of climate change hazards like- glacial lake outbursts, flash floods, etc. pose a significant risk to mountain habitats.
- Declining snow cover and accelerated melting of glaciers resulting in drying rivers, impact on hydropower energy, and degradation of water quality. According to ADB, if global warming reaches 3 degrees, upto 75% of glaciers will melt in parts of the Himalayas by 2100.
- Impact on livelihoods of mountain inhabitants in the short term and river basins in the long run. Economic losses in the region from disaster totaled \$45 billion from 1985 to 2014, more than any other mountainous region in the world.
- Adverse impact on mountain-dwelling species, some of which are expected to decline in numbers.

Global Initiatives for Protecting the Himalayan Ecosystem:

- The International Centre for Integrated Mountain Development (ICIMOD) is an intergovernmental knowledge and learning centre working for the people of the Hindu Kush Himalaya (HKH), located in Kathmandu (Nepal).
- Himalayan Adaptation Network by IUCN is a web-based network initiative in Sikkim to build climate-resilient strategies for reducing community and ecosystem vulnerability in the Indian Himalayan region (IHR) through the landscape approach.
- Living Himalayas Initiative by the World Wide Fund for Nature (WWF) to protect the biodiversity in the Eastern Himalayas.

India's Initiatives for Protecting the Himalayan Ecosystem:

- National Mission for Sustaining the Himalayan Eco-system (NMSHE) was launched under the National Action Plan on Climate Change (NAPCC) to continuously assess the health status of the Himalayan Ecosystem.
- SECURE (Securing livelihoods, conservation, sustainable use and restoration of high-range Himalayan ecosystems) Himalaya by MoEFCC (India) and the United Nations Development Programme (UNDP) as a part of the Global Wildlife Program (GWP), funded by the Global Environment Facility (GEF).

State of the Cryosphere 2024 Report:

- This is an annual report about the health of the Cryosphere around the World, which has been published since 2021 by the International Cryosphere Climatic Initiative.
- It noted that if carbon dioxide emissions continue to rise at the current pace, global temperatures will likely increase by 3°C or more than the pre-industrial levels by the end of this century, posing a grave threat to the planet's cryosphere, with far-reaching consequences for ecosystems, livelihoods, and the global economy.
- It states that due to rising temperatures, record glacier melting has occurred in 2023 globally, including in Asia. The Indian Himalayan Region is among the regions directly affected by these changes.
- The report underlines that due to warming, record glacier melting has occurred in 2023 globally, including in Asia. The HKH region witnessed record-low snowfall during the winter of 2023-2024. This decline in seasonal snow availability will also have an impact on food, energy, and water security for both the country and the region.

Cryosphere:

- The term Cryosphere has its roots in the Greek word Kryos, which means “icy cold”.
- The Cryosphere refers to the frozen water part of the Earth’s surface. Its components include snow, glaciers, ice caps, ice sheets, sea ice, and permafrost. These elements are primarily found in polar regions, high latitudes, and high-altitude areas of the Earth’s surface.
- The Cryosphere plays a crucial role in the Earth’s climate and water systems. It acts as a buffer stock of water and provides crucial water resources when perennial sources run dry or water availability is low.

Hyperloop Technology

GS III – Developing new technology

Context: The Avishkar Hyperloop team of IIT Madras in collaboration with TuTr (a startup) has recently completed a 410-meter Hyperloop test track, the first such experiment in Hyperloop technology in India.

Hyperloop Technology:

- It is a high-speed transportation system in which pods, essentially pressurized vehicles travel at extraordinary speeds through low-pressure tubes.
- It was originally popularised by Elon Musk in 2012.
- It is essentially a magnetic levitation (maglev) train system that uses one set of magnets to repel cars so that they hover above a track and another set of magnets to propel them forward over the track. The track in hyperloop technology is a low-pressure tube with built-in vacuums that remove nearly all air from the steel tube.

Components of Hyperloop:

- Two steel tubes are welded together to allow the capsules to travel in both directions. The expected air pressure inside the tube will be maintained around 100Pa.
- The capsule can carry passengers. Magnetic linear accelerators are used to accelerate the capsules.
- The compressor is at the front side of the capsule and allows the capsule to traverse through a low-pressure tube without choking the air flow that travels between the tube walls and the capsule.
- Suspension for reliability and safety, air-bearing suspensions are used.
- Propulsion to accelerate and decelerate the capsule linear induction motor is used over a permanent magnet motor, as it lowers the material cost, and reduces the weight of the capsule.

Advantages of Hyperloop Technology:

- Contactless levitation and propulsions systems combined with a low-pressure environment allow hyperloop pods to travel efficiently at ultra-high speeds.
- Ultra-high speeds of hyperloop allow coverage of large distances within minutes. Thus, reduces door-to-door travel time by directly connecting mobility hubs.
- As it is fully electric, using renewable energy to power hyperloop systems can make the entire hyperloop climate-neutral throughout its life cycle.
- It alleviates truck emissions as it can carry large container loads equivalent to 40 feet.

Issues/Challenges in Mainstreaming Hyperloop Technology:

- Hyperloop systems are very costly to implement due to the high cost of building long inter-city vacuum tubes.
- Hyperloop trains consume a large amount of energy as they are expected to consume 4-5 times of energy as compared to Shinkansen trains in Japan.
- Hyperloop systems face safety concerns such as fire, communication system challenges in capsules, etc.
- Hyperloop systems find it difficult to navigate corners. This requires building long straight-line tubes which is often difficult to find space and time.
- The human body is not designed to handle large lateral or vertical accelerations without intense nausea.

Green Credit Programme

GS III – Environmental Conservation

Context: The Ministry of Environment Forest and Climate Change (MoEFCC) has clarified that under the Green Credit Programme (GCP) primacy must be accorded to restoring ecosystems over merely tree planting

Green Credit Programme (GCP):

- It is an innovative market-based mechanism designed to incentivize voluntary environmental actions across diverse sectors, by various stakeholders like individuals, communities, private sector industries, and companies.
- It is designed to foster a sustainable lifestyle and environmental conservation as part of the **'LiFE' initiative** announced by the **Prime Minister** in the United Nations Climate Change Conference of the Parties (COP26).
- It encompasses **eight key types** of activities aimed at enhancing environmental sustainability:
 - Planting trees to increase green cover and combat **deforestation**.
 - Implementing strategies to efficiently manage and conserve water resources.
 - Promoting eco-friendly and **sustainable agricultural** practices.
 - Implementing effective waste management systems to reduce environmental **pollution**.
 - Initiatives aimed at reducing **air pollution** and improving air quality.
 - Protecting and restoring **mangrove** ecosystems for ecological balance.
- The operational framework of the Green Credit Programme involves a process where both individuals and corporations are allowed to contribute financially to the restoration efforts of forests deemed 'degraded'. This is facilitated through applications to the **Indian Council of Forestry Research and Education (ICFRE)**, an independent entity under the Environment Ministry.

Significance of the Green Credit Programme (GCP):

- India's environmental policies, such as the **Environment Protection Act of 1986**, and the **National Environment Policy of 2006**, provide a framework for protecting and improving the environment. These policies, alongside the GCP, aim to safeguard forests, wildlife, and the overall natural environment.
- The GCP is part of India's efforts to adhere to international commitments, such as those made during **COP26**. It complements the **Carbon Credit Trading Scheme** introduced by the **Energy Conservation (Amendment) Act of 2022** and broadens the scope of tradable credits beyond CO2 reductions to include a range of sustainable practices.
- The GCP aligns with the **UN Decade on Ecosystem Restoration (2021-2030)**, which emphasises the scaling up of restoration efforts. India's approach in this regard includes involving all stakeholders in the restoration process and leveraging traditional knowledge and conservation practices.

Issues/Challenges faced by the Green Credit Programme:

- Critics have raised concerns that the Green Credit Rules could be **detrimental to forest ecology**. The rules direct state forest departments to identify **'degraded land parcels'** for tree plantation to generate green credits. However, this approach has been criticised as **unscientific and potentially disastrous** for local ecosystems. The use of terms like 'degraded' for scrubland and open forests is considered vague and could lead to **industrial-scale plantations** that may irreversibly alter soil quality, replace **local biodiversity**, and harm ecosystem services.
- There is a fear that the Green Credit Rules might lead to the creation of **green deserts**. This term refers to areas where tree plantations are established without considering the ecological complexities and biodiversity of the original landscape. Such plantations can **disrupt the balance of ecosystems** and do not support the diverse range of species that a natural forest would.
- The rules have been criticised for measuring forests solely by **tree count**, which overlooks the multi-layered structure of a functional forest and its associated wildlife.
- The methodology for generating green credits, particularly through tree planting, has been questioned for its

environmental soundness. Critics are concerned that the methodology does not adequately address potential **regulatory gaps** and could lead to environmental degradation.

- The emphasis on planting trees on ‘degraded land parcels’ puts pressure on areas often categorized as **wastelands**, which are ecologically important. These areas, like **grasslands**, play a crucial role in carbon sequestration and supporting unique biodiversity. The push for afforestation in these areas could lead to a loss of endemic species and ecological functions.

Indian Council of Forestry Research and Education (ICFRE):

- It is responsible for overseeing the **financial contributions** directed towards **forest restoration**, which is then executed by the respective state forest departments.

Global Biofuel Alliance (GBA)

GS III – Environmental Conservation

Context: Global Biofuels Alliance (GBA) is a multi-stakeholder alliance of governments, international organizations, and industries, an initiative by India, bringing together the biggest consumers and producers of biofuels to drive the development and deployment of biofuels.

Global Biofuel Alliance (GBA):

- It aims to serve as a catalytic platform, fostering global collaboration for the advancement and widespread adoption of biofuels.
- It will act as a central repository of knowledge and an expert hub.
- Its members are Argentina, Brazil, Canada, India, Italy, South Africa, USA, Bangladesh, Singapore, Mauritius, UAE, Iceland, Kenya, Guyana, Paraguay, Seychelles, Sri Lanka, Uganda, and Finland. It also includes international organizations including the World Bank, Asian Development Bank, World Economic Forum, International Energy Agency, etc.

Significance of GBA:

- GBA will ensure a stable supply of eco-fuels and create a virtual marketplace connecting industries, countries, and tech providers, enhancing demand-supply mapping.
- It will facilitate the development, adoption, and implementation of internationally recognized standards, and regulations to incentivize biofuels adoption and trade.
- International Energy Agency (IEA) estimates that global sustainable biofuel production would need to triple by 2030 to put the world’s energy system on track towards net zero emissions by 2050.
- The transport sector is responsible for approximately one-quarter of greenhouse gas emissions.
- It will help raise awareness about biofuels’ role in reducing greenhouse gas emissions.

Issues/Challenges for GBA:

- There is a lack of consensus on what sustainable fuels are and countries don’t think biofuels are sustainable.
- Developing countries may encounter resistance from developed nations due to concerns about technological secrecy.
- Oil-producing nations might not favour the alliance.
- The deployment of biofuels is not accelerating fast enough, especially compared to other renewable resources like solar and wind.
- Limited availability of quality feedstock, effect on food production and prices, changes in cropping pattern, lack of cost-effective technologies, etc. may hamper sustainable production of biofuels.

Radioactive Discharge

GS III – Environmental Pollution

Context: The State Nuclear Regulatory Inspectorate of Ukraine has given approval for the commissioning of the Solid

Waste Retrieval Facility and Solid Waste Processing Plant at the Chernobyl nuclear power plant site. The facility will be able to process solid radioactive waste accumulated during the plant's operation as well as waste generated during the plant's decommissioning and also operational radioactive waste from the shelter object - the emergency structure that was built at pace in 1986 to cover unit 4 after the accident.

Radioactive Discharge:

- It refers to the **release of radioactive substances** into the environment as a result of **human activities, typically from nuclear facilities** such as nuclear power plants, research reactors, or other industrial processes involving radioactive materials.

Implications of radioactive discharge:

- Radioactive substances released into the environment can impact ecosystems, affecting plants, animals, and microorganisms. Radioactive particles can **settle on soil and sediment**, leading to contamination. In water bodies, radioactive substances may accumulate, potentially affecting aquatic life.
- Radioactive discharges can **expose nearby populations to ionizing radiation**. Prolonged or high-level exposure may increase the risk of radiation-related health issues, including cancer.
- Exposure to certain radioactive substances, such as strontium-90 and caesium-137, is associated with an **increased risk of cancer**, particularly if the exposure is prolonged. Ionizing radiation can potentially cause genetic mutations, increasing the risk of hereditary disorders in future generations.
- If radioactive substances enter the food chain, agricultural products and livestock may become contaminated, posing risks to consumers. In the **2011 Fukushima Nuclear Disaster**, nuclear radiation contaminated agricultural products, such as rice and fish, raising concerns about food safety.
- Areas near nuclear facilities that **experience radioactive discharges** may see a decline in **property values** due to safety concerns.

India's initiatives related to safe radioactive discharge:

- **The Atomic Energy Regulatory Board (AERB)** serves as the regulatory body for nuclear and radiation safety in India. It establishes and enforces regulations, guidelines, and standards to ensure the safe operation of nuclear facilities, including measures for radioactive discharge.
- Nuclear projects, including power plants, are subject to rigorous environmental impact assessments. These assessments evaluate potential environmental and health impacts, including radioactive discharges, before a project is approved.
- Nuclear facilities employ effluent treatment systems to manage liquid radioactive waste before discharge. Dilution and dispersion techniques are often used to minimize the concentration of radioactive substances in discharges.

International conventions and agreements related to safe radioactive discharge:

- **Convention on Early Notification of a Nuclear Accident** is a treaty adopted in 1986 by the **International Atomic Energy Agency (IAEA)**. The treaty requires countries to provide prompt notification of any nuclear accident that may affect other countries.
- **Joint Convention on the Safety of Spent Fuel Management and the Safety of Radioactive Waste Management** is a 1997 treaty from the IAEA. It was the first treaty to address radioactive waste management on a global scale. It aims to address the safety of spent fuel management and radioactive waste management, including the prevention of accidents and minimizing potential radiological hazards.
- **Convention on Nuclear Safety (CNS)** is a **legally binding treaty** that was adopted in 1994 and aims to ensure the safety of nuclear power plants. The CNS is an incentive-based treaty that requires states to establish and maintain a **regulatory framework for nuclear safety**. The CNS also aims to protect people, society, and the environment from the harmful effects of ionizing radiation.
- **European Union (EU) Directives on Radioactive Waste and Spent Fuel Management** require EU countries to have a national policy for managing radioactive waste and spent fuel. It also requires countries to create and implement national programs for managing these materials.

Social and Political Impacts of Artificial Intelligence

GS III – Awareness in the field of IT

Context: Amid growing concerns over how to develop regulatory oversight of artificial intelligence, without stifling the AI ecosystem, global leaders are set to gather in Paris on February 10 for a two-day AI Action Summit. This builds on an AI Safety Summit held in Britain in Bletchley Park in 2023 and a smaller meeting in Seoul in 2024.

Artificial Intelligence (AI):

- It is the ability of machines, especially computers, to perform tasks that typically require human intelligence. These tasks include things like understanding language, recognizing patterns, solving problems, and making decisions.

Positive Political Impacts of Artificial Intelligence:

- It is being increasingly used in innovative policy development.
- It is revolutionizing campaign strategies as it is used to craft resonant political messages through advanced analytics.
- It is being used as a platform for political engagement and political ideological development.
- AI-driven fundraising and business ventures mark a significant shift in political finance dynamics.

Negative Political Impacts of Artificial Intelligence:

- **It is used by** political leaders to replace an actual truth in media with lies by weaponizing deepfakes generated through AI.
- **It has eroded trust in democratic processes like elections through** doctored content, most likely in the form of a realistic fake video, which is presented as fact to alter public perception and create a democratic deficit.
- **It has raised concerns** about AI swaying elections and public opinion through the spread of false political narratives.
- **It has issues regarding** complex ethical and legal questions about AI's role in democratic processes due to the acceptance of AI-generated political contributions.

Positive Social Impacts of Artificial Intelligence:

- It has the potential to revolutionize the healthcare sector by improving the accuracy of diagnosis.
- It improves crop productivity by providing accurate agronomic and weather data by enabling precision agriculture.
- **It is helping to create empathy for people in war-torn regions through** projects like the Deep Empathy Project of MIT and UNICEF.
- It is being used to restore the voices of patients suffering from amyotrophic lateral sclerosis
- **It is used in the field of creative art and entertainment by using** deepfake technology to improve the dubbing of foreign languages, and films and resurrect dead actors.

Negative Social Impacts of Artificial Intelligence:

- The deepfakes created through AI are being used as a weapon to attack women's dignity and chastity.
- **It fuels radicalization and violence** as non-state actors like ISIS and Al-Qaeda, use fake videos to stir anti-state sentiments among people.
- There are fears of job losses due to the use of AI technology, which can prove to be more cost-efficient and productive to firms as compared to human capital.
- Its ability to analyze vast amounts of data raises significant concerns over data protection, cybersecurity, and privacy.
- It has grave implications for the environment as they require a lot of computing power.

Paris AI Summit:

- **It is an initiative of French President Emmanuel Macron.** It focuses on the broader agenda of global AI governance, and innovation, and on ways of serving the larger public interest.
- It aims to address the increasing concentration of power in the AI market, especially for the foundational models being owned by a few companies — Microsoft, Alphabet, Amazon, and Meta.
- Indian Prime Minister Narendra Modi is set to co-chair the Paris Summit and has accepted the invitation to travel to France.

Sovereign Wealth Fund (SWF)

GS III – Mobilization of Resources

Context: A Bharat Sovereign Wealth Fund (BSWF) or The Bharat Fund (TBF) can revolutionize the management of government equity in public sector enterprises (PSEs) and banks, unlocking an estimated `40 lakh crore (\$450-500 billion) in wealth across just 80-odd listed enterprises.

Sovereign Wealth Fund (SWF):

- It is a special investment vehicle owned by the government of a country for investing in different assets including financial assets of other countries.
- It is funded by government surpluses like revenues from natural resources, forex reserves, proceeds from divestment, privatization, etc., to expand the country's excess reserve pool through long-term investments.
- The Indian regulatory framework does not define SWFs as a distinct category of investments and considers them as any other foreign investment under:
 - Foreign Direct Investment (FDI)
 - Foreign Portfolio Investment (FPI)
 - Foreign Venture Capital Investments (FVCI)

SWFs as defined by the Santiago Principles of 2008 have the following key characteristics:

- It is owned by the general government, which includes both central government and sub-national governments.
- It includes investments in foreign financial assets.
- They invest for financial objectives.
- These key elements exclude public pension funds, owned by policyholders, and central bank reserve assets, which are not invested.

Importance/Significance of SWF:

- It increases the potential of the public wealth sector by unlocking an estimated Rs 40 lakh crore across 80 listed enterprises by investing and increasing returns from these state-owned entities.
- It helps in reducing fiscal deficit as 2% divestment from government equity could generate over USD 10 billion annually, reducing India's fiscal deficit from 4.9% to 4.6% of GDP.
- It can help boost national wealth by using India's excess forex reserves.
- It can drive long-term growth and innovation by investing in sectors like electric vehicles, hydrogen energy, semiconductors, biotechnology, and AI.
- It could support advocacy, incubate ventures, provide disaster relief, and invest in SWFs of other nations that boost India's international standing and soft power.

Issues/Concerns associated with SWF:

- It faces challenges due to persistent current account deficits and a significant fiscal deficit in India as SWFs are generally suitable for countries with mineral wealth or trade and budget surpluses.
- It could strain fiscal health by lowering its investment returns due to macroeconomic risks like global growth

slowdown, rising sovereign debt, and tightening financial conditions.

- Its investment strategies could be disrupted due to geopolitical tensions by affecting cross-border investments, supply chains, and trade policies.
- It faces risks from climate-exposed industries and stranded assets due to failed environmental policies.
- It may face challenges due to fraud and data theft due to technological vulnerabilities as it manages large sums of public money.

Steel Sector in India

GS III – Infrastructure

Context: In the grand success of India Steel 2023; the Ministry of Steel, Government of India, and FICCI are organizing the Sixth mega exhibition-cum-conference on the Indian steel industry titled INDIA STEEL 2025 from April 24-26, 2025 at the Bombay Exhibition Centre (NESCO), Mumbai.

Current status of the steel sector in India:

- India is the world's second-largest producer of crude steel, with an output of **125.32 million tonnes (MT) of crude steel** and 121.29 MT of finished steel production in FY23.
- The **per capita consumption** of steel in India stood at 86.7 kilograms in FY23.
- As per the **National Steel policy**, launched in 2017, India projects a crude steel capacity of 300 million tonnes (MT), production of 255 MT, and a robust finished steel per capita **consumption of 158 Kgs by 2030-31**.

Significance of steel:

- It is **one of the most widely used materials** all over the world. The iron and steel industries are the bottom-line producing industries.
- The steel industry plays a pivotal role in crucial sectors such as construction, infrastructure, automobile, engineering, and defence.
- Steel is a key sector for the Indian economy which is responsible for **2% of the country's GDP in FY 21-22**.

Challenges faced by the steel sector:

- One major hindrance is the significant investment required for establishing modern steel-making plants. The high cost of around Rs 7000.00 crores for a 1-tonne capacity plant, poses **challenges for many Indian entities**.
- The cyclical demand for steel in India is influenced by factors like monsoons that slow down construction and create financial challenges for steel plants. During low-demand periods, steel plants must operate with minimal income, leading to financial strain and, in severe cases, closures.
- India's low per capita consumption of steel, at 86.7 kgs compared to the world average of 233 kgs, **reflects economic disparities**. With low per-capita income and consumption, the incentive to establish **large-scale steel plants for economies of scale diminishes**.
- India historically **lags in investing in technology, research**, and development for the steel sector which results in dependence on international research and technology, incurring additional costs. Outdated and polluting technologies further contribute to the sector's unattractiveness.
- India's adherence to **traditional concrete-based construction methods**, rather than embracing steel, hinders the steel industry's growth.
- The steel industry is among the three biggest **producers of carbon dioxide**. Consequently, steel players across the globe are increasingly facing a decarbonization **challenge** to reduce their carbon footprint from both environmental and economic perspectives.
- From 1st January 2026, the European Union will start collecting the **Carbon Tax (Carbon Border Adjustment Mechanism)** on each **consignment of steel, aluminum, cement, fertilizer**, hydrogen, and electricity. It will harm **India's exports of metals such as iron, steel, and aluminium products** to the EU because these will face extra scrutiny under the mechanism.

Government initiatives for the growth of the steel sector:

- The government approved a **Rs 6322 crore outlay for 5 years** in the PLI Scheme to promote the manufacturing of specialty steel, attracting investments, and fostering technological advancements in the sector.
- The Ministry of Steel **constituted 13 Task Forces with the engagement of industry**, academia, think tanks, S&T bodies, different ministries, and other stakeholders to discuss, deliberate, and recommend different levers of decarbonization of the steel sector.
- The Ministry of New and Renewable Energy (MNRE) has announced a **National Green Mission for green hydrogen production and usage**. The steel sector has also been made a stakeholder in the mission.
- The **Ministry of Steel has integrated BISAG-N's capabilities into the PM Gati Shakti National Master Plan**, uploading geolocations of more than 2000 steel units to gain insights into steel production facilities which will aid in planning railway line extension, inland waterways, highways, ports, and gas pipeline connectivity.
- The **Steel Scrap Recycling Policy (SSRP)** was notified in 2019 which provides a framework to facilitate and promote the establishment of metal scrapping centers in the country for scientific processing and recycling of ferrous scrap generated from various sources **including end-of-life vehicles (ELVs)**.
- The **National Steel Policy of 2017** lays down the broad roadmap for encouraging **long-term growth for the Indian steel industry**, both on demand and supply sides by 2030-31.
- The Ministry of Steel has introduced a Steel Quality Control Order, thereby **banning sub-standard/ defective steel products both from domestic & imports** to ensure the availability of quality steel to the industry, users, and the public at large. As per the Order, it is ensured that only quality steel conforming to the relevant BIS standards is made available to the end users.
- **The National Metallurgist Award** is a prestigious award given by the Ministry of Steel to recognize the outstanding contributions of metallurgists in the iron and steel sector.

PAPER 4

Caste-based Discrimination in FPS and Ethics

GS IV –Dimensions of Ethics

Context: The recent directive by the District Collector, mandating the transfer of all ration cards from a Dalit-run Fair Price Shop (FPS) to a neighboring village, raises important ethical and constitutional questions.

Fair Price Shop (FPS):

- It is a government-run or government-regulated retail outlet or store in India.
- The primary purpose of fair-price shops is to **distribute essential commodities like food grains, edible oils, sugar**, and other necessities to the public at subsidized or fair prices.
- These shops are typically part of **government welfare programs** aimed at ensuring food security and reducing the economic burden on low-income households.

Ethical aspects involved in the incident:

- The core ethical issue in this case is **discrimination** based on caste leading to the transfer of ration cards.
- The district collector's directive to transfer ration cards can be seen as a **dereliction of duty**. The ethical principle of integrity, where public officials are expected to act in the best interest of all citizens without favouritism should be practiced.
- The mental trauma experienced by, the victim of caste-based discrimination, leading to a suicide attempt and physical injury, is a significant ethical concern. Ethical principles of **compassion, empathy, and the duty to protect individuals' well-being become important**.
- The convenors of the **Right to Food Campaign** call for the application of legal frameworks like the SC/ST Act and the National Food Security Act. The ethical principle of upholding the **rule of law** and respecting the constitution should be abided by.
- The violation of the mandated principles related to the empowerment of **marginalized communities** is a key ethical concern. Ethical principles of fairness, equity, non-discrimination, justice, and equality should be adhered to.
- The **moral responsibility** of the district collector and the upper caste households in addressing the consequences of their actions is raised.

Actions that could be taken in similar situations:

- Model of **Mid-Day Meals Scheme** implementation can be adopted where high dignitaries eat the cooked food to bust the myths of caste stigma and discrimination.
- Further legal action must be taken to address the **caste-based discrimination and social boycott effectively**. Linking such erroneous activities with **Annual Confidential Reports** of bureaucrats such that it acts as a deterrent in the future.
- The impending **revocation of the Dalit FPS dealer's license** raises concerns about economic repercussions and livelihoods.
- The Right to Food Campaign urges the **High Courts or Chief Minister's Office** of the government to take **Suo Motu cognizance** of the discriminatory ration card transfers. Such action is essential to uphold the rule of law and constitutional values.
- FPSs play a crucial role in **ensuring food security and access to essential commodities** for marginalized communities. Democratic empowerment of FPSs is vital to promote inclusivity and economic well-being.



Practice Questions



Q1.) Which of the following statements about Graphics Processing Units (GPUs) is correct?

- (a) GPUs are primarily designed for general-purpose computing rather than parallel processing.
- (b) GPUs have limited applications beyond gaming and graphic rendering.
- (c) GPUs are increasingly used in artificial intelligence, machine learning, and high-performance computing.**
- (d) GPUs operate independently of the Central Processing Unit (CPU) in computing devices.

Q2.) The Sea of Okhotsk is an important water body located in which of the following regions?

- (a) Between Japan and the Philippines
- (b) Between Russia and Alaska
- (c) Between Russia and Japan**
- (d) Between China and North Korea

Q3.) Point Nemo, often referred to as the "oceanic pole of inaccessibility," is known for:

- (a) Being the deepest point in the Pacific Ocean
- (b) Its proximity to space debris re-entry zones**
- (c) Being the closest landmass to Antarctica
- (d) Hosting the world's largest underwater volcanic chain

Q4.) With reference to Citizenship Laws, consider the following statements:

1. Jus soli refers to the right to citizenship based on birthplace, whereas jus sanguinis grants citizenship based on the nationality of one's parents.
2. Countries emphasizing cultural identity tend to follow jus sanguinis.
3. India granted automatic citizenship to all those born on Indian soil before 1987.

Which of the above statements is/are correct?

- (a) 1 and 3 only
- (b) 2 and 3 only
- (c) 1 and 2 only
- (d) 1, 2, and 3**

Q5.) Consider the following statements regarding Guneri Inland Mangroves:

1. They are the first Biodiversity Heritage Site (BHS) of Gujarat.
2. These mangroves are located near the coastline and are regularly accessed by seawater.
3. The presence of limestone deposits in the region supports the survival of these mangroves.

Which of the above statements is/are correct?

- (a) 1 and 2 only
- (b) 1 and 3 only**
- (c) 2 and 3 only
- (d) 1, 2, and 3

Q6.) Consider the following statements regarding Suzetrigine:

1. It is an opioid painkiller approved by the US FDA.
2. Unlike opioids, it works by targeting pain signals before they reach the brain.
3. It has a high potential for addiction similar to other opioid painkillers.

Which of the above statements is/are correct?

- (a) 1 and 3 only
- (b) 2 only**
- (c) 1 and 2 only
- (d) 1, 2, and 3

Q7.) With reference to Araku Valley, consider the following statements:

1. It is located in the Western Ghats of Karnataka.
2. The valley is known for its coffee, which has received a Geographical Indication (GI) tag.
3. The Borra Caves, a major tourist attraction in the valley, are limestone caves.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only**
- (c) 1 and 3 only
- (d) 1, 2, and 3

Q8.) With reference to the asteroid 2024 YR4, consider the following statements:

1. The asteroid 2024 YR4 was first discovered by a telescope in Chile.
2. The asteroid has been rated 6 on the Torino Scale, indicating a significant risk of global catastrophe.
3. NASA's Double Asteroid Redirection Test (DART) mission is aimed at planetary defence against such near-Earth objects.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
(b) 1 and 3 only
 (c) 2 and 3 only
 (d) 1, 2, and 3

Q9.) With reference to Extra-Long Staple (ELS) Cotton, consider the following statements:

1. ELS cotton varieties have fibre lengths of 30 mm and above, and they mainly come from the species *Gossypium barbadense*.
2. India is the largest producer of ELS cotton in the world, surpassing countries like China, Egypt, and Australia.
3. Indian farmers have been reluctant to adopt ELS cotton due to its lower per acre yield compared to medium staple cotton.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
(b) 1 and 3 only
 (c) 2 and 3 only
 (d) 1, 2, and 3

Q10.) The "Store Now, Decrypt Later" (SNDL) attack in the context of quantum computing refers to:

- (a) Storing encrypted data today with the aim of decrypting it later using quantum computers.**
 (b) Using quantum computing to break traditional passwords in real time.
 (c) Developing post-quantum cryptographic algorithms for secure data transmission.
 (d) Encrypting data with quantum-resistant algorithms to prevent future cyber threats.

Q11.) With reference to the 'Pineapple Express,' consider the following statements:

1. It is a type of atmospheric river that originates near the Hawaiian region and transports moisture towards the U.S. West Coast.
2. It is associated with bringing heavy rainfall and snowfall to regions where it makes landfall.
3. The Pineapple Express is unique to the North American region and does not occur elsewhere in the world.

Which of the statements given above is/are correct?

- (a) 1 and 2 only**
 (b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2, and 3

Q12.) Consider the following statements regarding the International Big Cat Alliance (IBCA):

1. It is an intergovernmental treaty-based organization focused on the conservation of seven big cat species.
2. India is the headquarters of IBCA.
3. Only range countries that host big cat species can become members of IBCA.

Which of the statements given above is/are correct?

- (a) 1 and 2 only**
 (b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2, and 3

Q13.) Consider the following statements regarding the United Nations Human Rights Council (UNHRC):

1. The UNHRC was established in 2006 to replace the United Nations Commission on Human Rights.
2. The UNHRC consists of 47 member states elected by the United Nations Security Council.
3. The Universal Periodic Review (UPR) process of the UNHRC reviews the human rights records of UN member states.

Which of the above statements is/are correct?

- (a) 1 and 2 only
 (b) 2 and 3 only
(c) 1 and 3 only
 (d) 1, 2, and 3

Q14.) With reference to the Garbhini-Drishti initiative, consider the following statements:

1. It is a data repository launched as part of the GARBH-INi program under the Department of Biotechnology (DBT), Government of India.
2. It focuses primarily on collecting data from newborn infants to improve post-natal healthcare.
3. The data platform includes clinical, epidemiological, imaging, and biospecimen data from pregnant women and newborns.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
(b) 1 and 3 only
 (c) 2 and 3 only
 (d) 1, 2, and 3

Q15.) Consider the following statements regarding the Ekuverin military exercise:

1. It is a joint military exercise conducted between India and Sri Lanka.
2. The exercise was first held in 2009 and has been conducted alternately in India and the Maldives.
3. The 13th edition of Ekuverin commenced in February 2025 in the Maldives.

Which of the above statements is/are correct?

- (a) 1 and 2 only
(b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2, and 3

Q16.) Which of the following correctly describes the sequence of steps in the working of a CO₂ battery?

1. CO₂ gas is compressed, which increases its temperature.
2. The hot CO₂ is then cooled in a heat exchanger, causing it to liquefy and be stored under pressure.
3. When energy is required, the stored liquid CO₂ is evaporated, expands, and drives a turbine to generate electricity.

Which option is correct?

- (a) 1 and 2 only
 (b) 2 and 3 only
 (c) 1 and 3 only
(d) 1, 2, and 3

Q17.) Regarding Article 200 of the Indian Constitution, which of the following statements is correct?

1. When a bill (other than a money bill) is returned by the Governor for reconsideration with a message, and the Legislature passes it again, the Governor is bound to give his assent.
2. The Governor may withhold assent indefinitely if he does not find the bill personally acceptable.
3. The Governor has the option to either grant assent, withhold assent, return the bill for reconsideration, or reserve the bill for the President's consideration.

Select the correct answer:

- (a) 1 and 2 only
(b) 1 and 3 only
 (c) 2 and 3 only
 (d) 1, 2 and 3

Q18.) Consider the following statements regarding the devolution of central taxes in India through the Finance Commission:

1. The Finance Commission (FC) is a constitutional body that recommends the sharing of a portion of central taxes with the states, addressing vertical imbalances.
2. The 15th Finance Commission recommended a 41% share of the divisible pool for the states.
3. Several states are demanding an increase in their share from the current level (41%) to 50%.

Select the correct answer:

- (a) 1 and 2 only
 (b) 1 and 3 only
(c) 1, 2 and 3 only
 (d) 2 and 3 only

Q19.) Consider the following statements regarding Article 371 of the Indian Constitution:

1. Article 371 provides special provisions exclusively for the states of Nagaland and Mizoram.
2. Article 371J accords special status to the Hyderabad-Karnataka region (Kalyana Karnataka).
3. Article 371F deals with the special provisions for Arunachal Pradesh.

Which of the above statements is/are correct?

- (a) 1 only
(b) 2 only
(c) 1 and 3 only
(d) 2 and 3 only

Q20.) Which of the following factors contribute to the extreme aridity of the Atacama Desert?

1. The rain shadow effect of the Andes Mountains
2. The influence of the Humboldt Current
3. The presence of large freshwater lakes
4. The Subtropical High-Pressure Belt

Select the correct answer using the codes given below:

- (a) 1 and 2 only
(b) 1, 2, and 4 only
(c) 1, 3, and 4 only
(d) 2, 3, and 4 only

Q21.) Consider the following statements regarding Shatavari (*Asparagus racemosus*):

1. It is primarily cultivated in temperate regions of India.
2. It is widely used in Ayurveda for its role in women's reproductive health.
3. It is promoted under the National Medicinal Plants Board (NMPB) for commercial cultivation.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q22.) Consider the following statements regarding Pradhan Mantri Anusuchit Jaati Abhyuday Yojana (PM-AJAY):

1. It is a Centrally Sponsored Scheme launched in 2021-22 under the Ministry of Rural Development.
2. The scheme aims to transform Scheduled Caste-dominated villages into model villages with access to basic services.
3. It provides financial assistance for livelihood projects, infrastructure development, and hostel construction for SC students.

Which of the above statements is/are correct?

- (a) 1 and 2 only
(b) 2 and 3 only

- (c) 1 and 3 only
(d) 1, 2, and 3

Q23.) Which of the following statements regarding Autonomous District Councils (ADCs) is/are correct?

1. ADCs are established under the Fifth Schedule of the Indian Constitution.
2. These councils have legislative, judicial, and financial powers within their jurisdictions.
3. ADCs exist in the northeastern states of Assam, Meghalaya, Tripura, and Mizoram.

Select the correct answer using the code below:

- (a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q24.) Exercise Cyclone, recently in the news, is a joint military exercise between India and which of the following countries?

- (a) France
(b) Egypt
(c) Indonesia
(d) UAE

Q25.) Consider the following statements regarding the "Shadow Fleet":

1. It consists of vessels that frequently change their flag registration to evade tracking and sanctions.
2. These ships turn off their Automatic Identification System (AIS) to operate undetected, violating international maritime laws.
3. The shadow fleet primarily operates in the Indian Ocean to facilitate illegal fishing activities.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2, and 3

Q26.) With reference to Lymphatic Filariasis (LF), consider the following statements:

1. LF is caused by parasitic worms, including *Wuchereria bancrofti* and *Brugia* species.

- The primary mode of transmission is through contaminated water and food.
- India's strategy to eliminate LF includes Mass Drug Administration (MDA) and vector control measures.

Which of the statements given above is/are correct?

- (a) 1 and 3 only
 (b) 2 and 3 only
 (c) 1 and 2 only
 (d) 1, 2, and 3

Q27.) Which of the following statements about the Pradhan Mantri YUVA (Young, Upcoming, and Versatile Authors) scheme is correct?

- It is an initiative of the Ministry of Education, launched in 2021, to mentor young authors under the age of 30.
- Selected authors under the scheme receive a monthly scholarship and mentorship.
- The books developed under this scheme are published internationally, bypassing Indian publishers.

Select the correct answer using the code below:

- (a) 1 and 2 only
 (b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2, and 3

Q28.) Consider the following statements regarding Dayanand Saraswati:

- He founded the Arya Samaj in 1875 to promote Vedic principles.
- He strongly supported idol worship and ritualistic traditions of Hinduism.
- He advocated for the education of women and opposed child marriage.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
 (b) 1 and 3 only
 (c) 2 and 3 only
 (d) 1, 2, and 3

Q29.) With reference to President's Rule in India, consider the following statements:

- It is imposed under Article 356 of the Indian Constitution.

- The initial duration of President's Rule is two months, extendable up to ten years with parliamentary approval.

- The Election Commission plays no role in the extension of President's Rule beyond one year.

Which of the statements given above is/are correct?

- (a) 1 and 3 only
 (b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2, and 3

Q30.) Which of the following statements about Sarojini Naidu is NOT correct?

- She was the first Indian woman to become the President of the Indian National Congress.
- She actively participated in the Civil Disobedience Movement and Salt Satyagraha.
- She was the first Indian woman to be appointed as the Governor of a state post-independence.

(d) She was awarded the Bharat Ratna for her contributions to India's freedom struggle.

Q31.) Which of the following statements regarding the Einstein Ring is correct?

- A) It is caused by the refraction of light from distant galaxies due to interstellar dust.

B) It is a phenomenon where light bends around a massive object due to gravity, forming a ring-like structure.

- C) It occurs due to the scattering of light from dark matter particles.

- D) It is a type of black hole event horizon that emits visible light.

Q32.) Consider the following statements regarding malaria:

- It is caused by a bacterial pathogen transmitted by the Culex mosquito.
- Plasmodium falciparum is the most severe species and can cause cerebral malaria.
- Malaria vaccines are highly effective because Plasmodium has a simple life cycle.

Which of the above statements is/are correct?

- A) 1 and 2 only
B) 2 only
 C) 1 and 3 only
 D) 1, 2, and 3

Q33.) Which of the following statements regarding the Corruption Perceptions Index (CPI) is correct?

- A) It is published annually by the World Bank.
- B) It ranks countries based on real corruption cases and legal convictions.
- C) A higher CPI score indicates a higher level of corruption in a country.
- D) India's ranking in the 2024 CPI report has declined compared to previous years.**

Q34.) With reference to Dokra artwork, consider the following statements:

- 1. Dokra art is a non-ferrous metal casting technique that uses the lost-wax method.
- 2. The art form originated during the Mughal period.
- 3. Dokra artwork is primarily associated with tribal communities in Kerala.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1 only**
- (d) 1, 2, and 3

Q35.) With reference to the Climate Risk Index (CRI), consider the following statements:

- 1. The CRI is published annually by the United Nations Environment Programme (UNEP).
- 2. It assesses countries based on the impact of extreme weather events, including economic losses and human fatalities.
- 3. According to the Global Climate Risk Index 2025, India ranks among the top 10 most affected countries in the long-term assessment (1993–2022).

Which of the statements given above is/are correct?

- (a) 1 and 2 only
- (b) 2 and 3 only**
- (c) 1 and 3 only
- (d) 1, 2, and 3

Q36.) With reference to Sovereign Green Bonds (SGrBs), consider the following statements:

- 1. These bonds are issued by private corporations to finance environmentally sustainable projects.

- 2. The Indian government introduced its Sovereign Green Bond framework in 2022.
- 3. Funds raised through SGrBs can be used for fossil fuel-based energy projects if they promote energy efficiency.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only**
- (c) 2 and 3 only
- (d) 1, 2, and 3

Q37.) Which of the following statements regarding President's Rule under Article 356 of the Indian Constitution is/are correct?

- 1. President's Rule can be imposed in a state if the constitutional machinery of that state has failed.
- 2. The proclamation of President's Rule must be approved by a simple majority in both Houses of Parliament within two months.
- 3. Once approved, President's Rule can remain in force indefinitely.

Select the correct answer using the codes below:

- (a) 1 and 2 only**
- (b) 2 and 3 only
- (c) 1 and 3 only
- (d) 1, 2, and 3

Q38.) Under the Forest Rights Act (FRA), 2006, which of the following rights are recognized?

- 1. Individual forest rights over land for cultivation.
- 2. Community rights over common property resources such as grazing grounds.
- 3. Rights to protect and conserve forests and biodiversity.
- 4. Absolute rights over protected areas granted to individuals.

Select the correct answer using the codes below:

- (a) 1 and 2 only
- (b) 2 and 3 only
- (c) 1, 2, and 3 only**
- (d) 1, 2, 3, and 4

Q39.) Which of the following statements about indirect prompt injection attacks is/are correct?

1. Indirect prompt injection involves embedding malicious commands within external data sources like emails or web content.
2. These attacks can lead to unauthorized actions being executed by AI systems.
3. Restricting external data access and implementing input validation can help mitigate such attacks.

Select the correct answer using the codes below:

- (a) 1 and 2 only
 (b) 2 and 3 only
 (c) 1 and 3 only
(d) 1, 2, and 3

Q40.) Consider the following statements regarding the Experimental Advanced Superconducting Tokamak (EAST) and nuclear fusion:

1. It is a nuclear fusion reactor designed to generate electricity.
2. EAST aims to achieve self-sustaining nuclear fusion, also known as ignition.
3. Nuclear fission produces harmful radioactive waste whereas nuclear fusion doesn't.

Which of the above statements is/are correct?

- (a) 1 and 2 only
 (b) 2 and 3 only
(c) 3 only
 (d) 1, 2, and 3

Q41.) With reference to Project Waterworth, consider the following statements:

1. It is a multi-billion-dollar initiative by Meta to build the world's longest undersea cable system.
2. The project aims to support artificial intelligence (AI) infrastructure by enhancing global connectivity.
3. The cable system will exclusively connect North America and Europe.

Which of the above statements is/are correct?

- (a) 1 and 2 only
 (b) 2 and 3 only
 (c) 1 and 3 only
(d) 1, 2, and 3

Q42.) With reference to Ramakrishna Paramahansa, consider the following statements:

1. He was born in Tamil Nadu.
2. He served as a priest at the Dakshineswar Kali Temple near Kolkata.

3. He emphasized the harmony of religions and believed that all faiths lead to the same ultimate truth.
4. Swami Dayananda Saraswati was his most prominent disciple who spread his teachings worldwide.

Which of the above statements is/are correct?

- (a) 2, and 3 only
 (b) 2 and 4 only
 (c) 1 and 3 only
(d) 1, 2, 3, and 4

Q42.) Which of the following statements regarding earthquakes in Delhi is/are correct?

1. Delhi falls under Seismic Zone 5, the most earthquake-prone classification in India.
2. The recent magnitude 4 earthquake in Delhi had its epicenter within the city, near Dhaula Kuan.
3. The Aravalli-Delhi Fold Belt is a major seismically active zone due to the continuous subduction of tectonic plates.

Select the correct answer using the codes given below:

- (a) 1 and 2 only
(b) 1, 2, and 3
 (c) 1 and 3 only
(d) 2 only

Q43.) Which of the following statements about the Biannual Transparency Report (BTR) is/are correct?

1. The BTR is a part of the Enhanced Transparency Framework (ETF) under the Paris Agreement.
2. India has been submitting BTRs since 2015 as part of its Nationally Determined Contributions (NDCs).
3. The BTR includes details on greenhouse gas emissions, climate change mitigation measures, and financial support received for climate action.

Select the correct answer using the codes given below:

- (a) 1 and 2 only
 (b) 2 and 3 only
(c) 1 and 3 only
 (d) 1, 2, and 3

Q43.) Consider the following statements regarding the PM-AASHA scheme:

1. The scheme includes a Price Support Scheme (PSS) under which oilseeds and pulses are procured directly from farmers at Minimum Support Prices (MSP).
2. The Price Deficiency Payment Scheme (PDPS) under PM-AASHA provides direct compensation to farmers without physical procurement of crops.
3. The Pilot of Private Procurement & Stockist Scheme (PPPS) allows private players to procure wheat and rice at MSP to reduce government procurement burden.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
 (b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2, and 3

Q44.) Which of the following statements regarding India-Qatar relations is correct?

- (a) Qatar is India's second-largest supplier of LNG after Saudi Arabia.
(b) India and Qatar have elevated their ties to a strategic partnership in 2024.
 (c) The Indian population in Qatar constitutes less than 10% of its total population.
 (d) India has no defence cooperation with Qatar.

Q45.) Which of the following are key objectives of the Soil Health Card (SHC) Scheme launched by the Government of India?

1. To provide farmers with soil test-based recommendations for nutrients and fertilizers.
2. To increase chemical fertilizer consumption for higher crop productivity.
3. To promote balanced use of fertilizers and reduce input costs.
4. To assess soil quality every 10 years.

Select the correct answer using the code below:

- (a) 1, 2, and 3 only
 (b) 2 and 4 only
(c) 1 and 3 only
 (d) 1, 3, and 4 only

Q46.) Consider the following statements regarding the Caspian Pipeline Consortium (CPC):

1. The CPC pipeline transports crude oil from Kazakhstan to the Baltic Sea for export.
2. Russia and Kazakhstan are the key stakeholders in the CPC.
3. The pipeline is strategically important for the transportation of oil from Kazakhstan's Tengiz oil field.

Which of the statements given above is/are correct?

- (a) 1 and 2 only
(b) 2 and 3 only
 (c) 1 and 3 only
 (d) 3 only

Q47.) Consider the following statements regarding the Advocate-on-Record (AoR) system in the Supreme Court of India:

1. Only an Advocate-on-Record (AoR) is authorized to file cases before the Supreme Court of India.
2. Any advocate with five years of legal practice is eligible to become an AoR without any additional examination.
3. An AoR must maintain an office within a specified radius of the Supreme Court and have a registered clerk.

Which of the above statements is/are correct?

- (a) 1 and 3 only
 (b) 2 and 3 only
 (c) 1 and 2 only
 (d) 1, 2, and 3

Q48.) With reference to Microsoft's Majorana 1 quantum computing chip, consider the following statements:

1. Majorana 1 is based on topological quantum computing, utilizing Majorana fermions for greater stability.
2. The chip integrates eight topological qubits, making it less prone to errors compared to traditional qubits.
3. Majorana 1 is designed primarily for commercial consumer use in personal computing devices.

Which of the above statements is/are correct?

- (a) 1 and 2 only
 (b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2, and 3

Q49.) Match the following committees with their respective objectives:

Committee Name Objective

- | | |
|-----------------------------|---|
| A. Dinesh Khara Committee. | 1. Review and suggest reforms in the Insurance Act |
| B. Kasturirangan Committee. | 2. Recommend policies for Western Ghats |
| C. Shyam Benegal Committee. | 3. Propose reforms in film certification and censorship policies in India |
| D. Bimal Jalan Committee. | 4. Review economic capital framework and financial reserves |

Select the correct match using the code below:

- (a) A-2, B-3, C-4, D-1
(b) A-1, B-2, C-3, D-4
 (c) A-3, B-1, C-2, D-4
 (d) A-4, B-1, C-2, D-3

Q50.) Consider the following statements regarding Stagflation:

1. Stagflation is a situation where high inflation is accompanied by high economic growth.
2. It is primarily caused by supply-side shocks that lead to rising costs while economic output stagnates.
3. Stagflation was first widely recognized during the 1970s oil crisis.

Which of the above statements is/are correct?

- (a) 1 and 2 only
(b) 2 and 3 only
 (c) 1 and 3 only
 (d) 1, 2, and 3