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from



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- International Big Cat Alliance (IBCA)
- New Rules and Regulations for Ladakh

- Gig Economy
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INDIA'S FIRST DIGITAL CENSUS

Why in News: The Government of India has officially announced the timeline for the country's 16th Census. It will be conducted in two phases, with reference dates set as:

- **October 1, 2026:** For snow-bound and remote regions such as Jammu & Kashmir, Ladakh, Himachal Pradesh, and Uttarakhand.
- **March 1, 2027:** For the rest of the country.

Note: This will be India's first fully digital census, marking a historic shift in how demographic and socio-economic data is collected.

Why is the Census Important?

The Census of India, conducted every ten years, is the largest administrative exercise in the world. It plays a vital role in governance, policy, and development. Here's why:

- **Electoral Demarcation:** Based on Articles 82, 330, and 332 of the Constitution, census data is used to redraw electoral boundaries and reserve seats for Scheduled Castes (SCs) and Scheduled Tribes (STs).
- **Resource Allocation:** It guides the distribution of funds, subsidies, and ration quotas to states and districts, ensuring that resources reach the right population.
- **Planning & Development:** Ministries like Education, Health, and Rural Development use census data to locate schools, health centres, and other critical infrastructure.
- **Understanding Society:** It provides insights into migration patterns, urbanisation, employment trends, family structures, and living conditions, helping researchers, courts, and policymakers.

How is the Census Conducted?

The Census takes place in two major phases:

1. House-listing and Housing Census

In this phase, enumerators visit each household to collect information about:

- Building type and materials
- Number of rooms and residents
- Source of water, electricity, and cooking fuel
- Ownership of TV, phone, vehicle, etc.

2. Population Enumeration

This phase gathers individual-level data, including:

- Name, age, gender, marital status
- Education, occupation, religion, caste/tribe
- Disability status and migration history

Even homeless individuals are counted during this phase to ensure complete coverage.

What's New in the 2027 Census?

The upcoming census introduces major technological innovations and policy changes to improve accuracy, inclusivity, and efficiency.

1. First Digital Census

For the first time, the entire census will be digitally conducted using:

- **Mobile apps** for data entry
- **Online self-enumeration** by citizens
- **Near real-time monitoring** through a centralised dashboard

2. Self-Enumeration Option

Households can choose to self-enumerate by logging onto a government portal or mobile app, filling in their data, and generating a unique code to share with the enumerator.

3. Digital Tools for Enumerators

Enumerators will be equipped with smartphones or handheld devices preloaded with the census app. They will get higher remuneration for using digital tools, encouraging widespread adoption.

4. GPS & Geo-Fencing

- **GPS tagging** of each household ensures precise location data.
- **Geo-fencing** technology will prevent coverage gaps.
- Replaces traditional physical maps used in 2011.

5. Mobile Tracking and Validation

Enumerators will receive real-time alerts in case of:

- Incorrect age entries
- Unusual household sizes
- Missing responses

This reduces errors and improves data quality.

6. Digital Coding System

To avoid spelling errors and delays from manual entry, the

census will use **standardised digital codes** (code directories) for:

- Languages
- Occupations
- Caste/Tribe names
- Places of birth

This will **reduce human bias** and **speed up processing**.

What New Questions Will Be Asked?

Several **new and relevant questions** have been added to make the data more useful for modern policymaking.

In the House-listing Phase:

- Do you have an **internet connection**?
- Do you own a **mobile phone or smartphone**?
- Is there a **source of drinking water** inside your house?
- What kind of **gas connection** do you use (LPG or piped gas)?
- Do you own a **vehicle** (two-wheeler, car, or commercial)?
- Provide a **mobile number** for future census communication.
- What **type of cereal** does your household consume?

In the Population Enumeration Phase:

- **Caste Enumeration:** For the first time since 1931, there will be a **comprehensive caste count** for **all communities**, not just SC/ST.
- **Migration Reasons:** New options like **climate change** or **natural disasters** will be included.
- **Technology Use:** Whether individuals use the **internet or smartphones**.
- **Gender Identity:** The form will include an **explicit option for transgender identity**, making it **more inclusive**.

Conclusion

The **2027 Census** represents a **major step forward** for India in **modernising data collection**. With digital technology, real-time monitoring, and inclusion of critical new indicators like caste and internet access, it will offer **richer, more accurate, and more actionable insights** into Indian society.

This comprehensive and tech-driven census will not only **strengthen policy-making** but also improve **targeted delivery of welfare schemes**, making governance more **responsive and equitable**.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the significant changes in data collection for the 2027 Census. How will the 2027 digital census improve data accuracy and efficiency? [250 words] [15 marks]

OVERCOMING VOTER APATHY

Why in News: As Kerala gears up for its next big **Assembly elections**, the state's election officials are focusing their attention on a crucial concern — the **low participation of young voters**. Despite being an educated and politically aware society, Kerala is witnessing a noticeable **voter apathy among people aged 18 to 30 years**.

Youth Voter Participation and Electoral Awareness Survey

A special initiative titled the **Youth Voter Participation and Electoral Awareness Survey** is currently being conducted across the state. According to **Chief Electoral Officer (CEO)**, the main aim is to **identify the reasons** behind the hesitation or reluctance of young people to participate in the electoral process.

Initial Findings (Apathy and Lack of Awareness)

The **early responses** from the survey indicate two major issues:

- **Lack of interest** in elections.
- **Lack of awareness** about the voting process.

These insights point to the need for **better civic education** and more engaging outreach strategies.

Youth Suggestions

Interestingly, young participants have also given **constructive feedback**. They want:

- **More interactive sessions and discussions** about voting.
- Greater presence of election-related activities in **college campuses**.
- **Social media campaigns** to connect with youth in a relatable and appealing manner.

These suggestions are now shaping the Election Commission's approach.

Strengthening Electoral Literacy on Campuses

To take things forward, the CEO announced that steps are being taken to:

- **Establish new Electoral Literacy Clubs (ELCs)** in colleges that do not have them.
- **Strengthen existing ELCs** to create vibrant hubs of awareness and democratic engagement among students.
 - These clubs serve as vital platforms where students can learn about their **rights and responsibilities as voters**, and how their participation shapes the future of democracy.

ECI's Programs to Increase Voter Turnout

Systematic Voter Education and Electoral Participation (SVEEP) Program

- **Launched:** 2009
- **Objective:** To promote **voter education, awareness, and electoral participation** across India.
- It is the **flagship program** of the Election Commission of India (ECI) for **enhancing voter literacy** and ensuring informed and ethical participation of citizens in the electoral process.

• Key Features:

- Uses **general and targeted interventions** tailored to the **socio-economic, cultural, and demographic** context of each state or region.
- Strategies are designed based on the **electoral participation trends**, challenges faced in previous elections, and lessons learned.
- Employs **multimedia campaigns**, school and college outreach, community mobilization, and partnership with government and civil society organizations.

Voter Helpline App

• **Launched:** 2019

• **Purpose:** To provide a **single-point digital platform** for all voter services and information.

• Key Features:

- **Voter registration**, correction of details, and downloading of **digital voter ID (e-EPIC)**.
- **Search name in electoral roll** and check polling booth details.
- Access to **election-related information**, such as candidate affidavits, polling schedules, and FAQs.
- Facility to **lodge grievances** related to elections and monitor their status.
- Real-time updates on **voter turnout** and polling trends.

Turnout Implementation Plan (TIP)

➤ A **targeted voter outreach strategy** for the 2024 Lok Sabha elections, aiming to surpass **70% turnout**, building on past records of 66.4% (2014) and 67.6% (2019)

➤ **Four Key Pillar:**

- ◆ **Voter Registration** – Rigorous roll revision and enabling remote voting for internal migrants.
- ◆ **Voter Awareness** – Multichannel education campaigns covering registration, voting process, grievance redressal, etc.
- ◆ **Voter Facilitation** – Accessible ICT platforms (online forms, pollingstation locators, helplines).
- ◆ **Voter Feedback** – Collecting insights from voters, officials, civil society, and media.

➤ **Focus Areas:**

- ◆ Deployed in **10 large states** and around **250 constituencies** with low or middling turnout.
- ◆ **Boothlevel profiling:** DEOs and BLOs diagnose lowturnout causes and craft local interventions.

◆ Engaging **youth and urban voters** through focused messaging to reduce apathy.

Inclusive Enrolment Campaign

This initiative is part of a **larger statewide campaign** to ensure **inclusive electoral participation**, particularly among **marginalised sections**. Special attention is being given to ensure **100% voter enrolment** in five key categories:

- Particularly Vulnerable Tribal Groups (PVTG)
- Scheduled Caste (SC) communities
- Persons with Disabilities (PwD)
- Senior citizens above 85 years
- **Transgender voters**

Conclusion

*Kerala's proactive efforts to connect with young voters are a timely and commendable step. A strong democracy thrives not just on free and fair elections but also on **active and informed citizen participation**, especially from the youth who represent the **future of the nation**.*

*By **listening to young voices**, understanding their concerns, and using innovative platforms like colleges and social media, the Election Commission is **charting a new course** towards making elections more **inclusive, vibrant, and youth-driven**.*

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Low voter turnout among the youth poses a serious challenge to the vibrancy of India's democratic process. In light of the recent voter participation survey initiative undertaken in Kerala, critically examine the causes of youth apathy towards elections and suggest comprehensive measures to enhance their electoral participation. [250 words] [15 marks]

KARNATAKA GOVERNMENT TO CONSIDER STRICTER LAW AGAINST HATE SPEECH

Why in News: The Karnataka government is **exploring the possibility of introducing a stronger legal framework to address hate speech and related crimes**, especially those spread through social media platforms. During a recent visit to Dakshina Kannada district, **a senior minister emphasized the urgent need for a more effective law to deter such offences.**

Background

- The remarks came in the wake of a recent violent incident in Bantwal taluk, **where a religious functionary was murdered and another individual was assaulted.** The brutal attack has

raised serious concerns about **communal tensions and hate-driven violence** in the region.

- Law enforcement agencies responded quickly, arresting five individuals in connection with the case. **These arrests underscore the seriousness of the situation and the need for preventive legal mechanisms.**

Need for a Stronger Law

- The minister **acknowledged growing concerns over the rise of hate speech in the state.** He noted that under existing legal provisions, individuals accused of spreading hate — **whether through public speeches or online platforms** — are often able to secure bail quickly. **This ease of obtaining bail, he argued, weakens the deterrent effect of the law and undermines efforts to maintain communal harmony.**
- He pointed out that online hate speech, in particular, can fuel social unrest and provoke violence. **Therefore, there is a need for legislation that includes stricter provisions and more serious consequences for offenders.**

Balancing Free Speech with Social Responsibility

- While **freedom of speech is a constitutionally protected right**, there is growing recognition that unchecked hate speech, especially in digital spaces, can threaten public order and national unity.
- Legal experts and civil society have long argued that **existing laws are insufficient, poorly enforced, and allow accused persons to evade accountability** through bail provisions.

What is Hate Speech?

According to the **267th Report of the Law Commission of India**, **hate speech** refers to words or actions that **incite hatred** against individuals or groups based on their **race, religion, caste, ethnicity, gender, sexual orientation**, etc.

Legal Position of Hate Speech in India

Freedom of Speech vs. Hate Speech

- **Article 19(1)(a)** of the Constitution: Guarantees freedom of speech and expression.
- **Article 19(2)**: Allows **reasonable restrictions** in the interest of:
 - Sovereignty & integrity of India
 - Public order, decency, morality
 - Security of the State
 - Friendly relations with foreign countries
 - Contempt of court, defamation, or incitement to an offence

Indian Penal Code (IPC) Provisions

- **Section 153A**: Punishes promoting enmity between groups based on religion, race, etc.
- **Section 153B**: Punishes claims that any group is inferior or should be denied rights.
- **Section 295A**: Penalizes deliberate acts to outrage religious feelings.

- **Sections 505(1) & 505(2)**: Punish publication or circulation of statements that create fear or hatred among communities.

Representation of the People Act (RPA), 1951

- **Section 8**: Disqualifies individuals convicted for misusing free speech in elections.
- **Sections 123(3A) & 125**: Ban use of religion, caste, language, etc., to promote enmity during elections; consider it a **corrupt practice**.

Other Laws

- **SC/ST (Prevention of Atrocities) Act, 1989**: Punishes hate speech against Scheduled Castes and Tribes in public view.
- **Protection of Civil Rights Act, 1955**: Penalizes verbal or written promotion of **untouchability** and caste-based discrimination.

Key Judicial Cases on Hate Speech

Shaheen Abdulla v. Union of India (2022)

- The Supreme Court said **fraternity is not possible** unless communities live in peace.
- Directed police to take **suo motu (proactive)** action against hate speech, even without complaints.

Pravasi Bhalai Sangathan v. Union of India (2014)

- The Court did **not penalize hate speech** as no specific law existed.
- Recommended the **Law Commission** to examine the issue instead of judicial overreach.

Shreya Singhal v. Union of India (2015)

- Struck down **Section 66A** of the IT Act.
- Distinguished between:
 - **Discussion & Advocacy** (protected under Article 19(1)(a))
 - **Incitement** (can be restricted under Article 19(2))

Possible Features of the Proposed Law

The proposed legal reform may include:

- Harsher penalties for those inciting communal violence or spreading hate.
- Enhanced regulation of online hate speech.
- Stricter bail conditions for hate speech and communal offence cases.
- A dedicated institutional mechanism to monitor and address hate content on social media.

At the same time, any new legislation must be crafted with caution to prevent misuse or infringement on constitutionally guaranteed freedoms, particularly the right to free expression.

Conclusion

The developments in Dakshina Kannada highlight the persistent challenge that hate speech and communal violence pose to India's social cohesion. As the Karnataka government considers legislative reforms, it will be essential to strike a balance between ensuring justice and safeguarding civil liberties. The recent incident must serve as a wake-up call, prompting timely and

meaningful action from lawmakers, law enforcement, and the public alike.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. In light of recent incidents of communal violence and hate speech in Karnataka, critically examine the challenges in curbing hate speech in India. How can legislation strike a balance between freedom of speech and the need to maintain social harmony? Suggest suitable legal and institutional reforms. [250 words] [15 marks]

NEW RULES AND REGULATIONS FOR LADAKH

Why in News: The Central Government has recently notified a set of new rules and regulations for Ladakh, aimed at addressing the long-standing concerns of civil society regarding land rights, job reservations, and cultural preservation. These measures come amid growing demands from the local population for constitutional safeguards, especially under the Sixth Schedule of the Indian Constitution.

Key Regulations Introduced

- Ladakh Civil Services Decentralization and Recruitment (Amendment) Regulation, 2025**
 - **Domicile Requirement Introduced:** Candidates applying for government jobs in Ladakh must be domiciles.
 - **Who is a Domicile?**
 - ◆ A person who has lived in Ladakh for 15 years, OR
 - ◆ Studied there for 7 years and passed Class 10 or 12 exams, OR
 - ◆ Children of Central Government employees who have worked in Ladakh for at least 10 years, OR
 - ◆ Spouses and children of domiciles.
- Ladakh Civil Services Domicile Certificate Rules, 2025**
 - **Issuing Authority:** Tehsildar will issue domicile certificates.
 - **Appellate Authority:** Deputy Commissioner.
 - **Application Process:** Can be submitted online or offline.
- Union Territory of Ladakh Reservation (Amendment) Regulation, 2025**
 - Maintains 10% reservation for Economically Weaker Sections (EWS).
 - Caps total reservations for SC, ST, OBC, and other backward groups at 85%.

- Ladakh Official Languages Regulation, 2025**
 - Recognises English, Hindi, Urdu, Bhoti, and Purgi as official languages.
 - Also promotes Shina, Brokskat, Balti, and Ladakhi for cultural preservation.
- Ladakh Autonomous Hill Development Councils (Amendment) Regulation, 2025**
 - Amends the LAHDC Act of 1997 to reserve one-third of seats for women in both Leh and Kargil Hill Councils on a rotation basis.

Major Limitations of the New Regulations

- Lack of Constitutional Protection**
 - These rules have been created using Article 240, which allows the President to make regulations for Union Territories.
 - Unlike the Sixth Schedule, these executive regulations do not have constitutional status and can be altered or removed by the Centre at any time.
- No Land Ownership Safeguards for Locals**
 - The rules do not restrict non-domiciles from buying land in Ladakh.
 - This is a major concern due to the region's fragile ecology, ongoing infrastructure projects, and mass tourism.
- Weak Local Governance**
 - The Ladakh Autonomous Hill Development Councils (LAHDCs) continue to be administrative bodies only, with no legislative powers.
- Symbolic Cultural Recognition**
 - Though several local languages are recognised, there is no clear plan on how they will be integrated into education, government, or judicial systems.

The Demand for Inclusion Under the Sixth Schedule

After the abrogation of Article 370 in 2019 and the enactment of the Jammu and Kashmir Reorganisation Act, Ladakh became a Union Territory without a legislature. This led to:

- Fears among locals about the dilution of their tribal identity and land rights.
- Concerns over the sensitive ecology of the region.
- Demands for inclusion under the Sixth Schedule of the Constitution, especially since over 90% of Ladakh's population belongs to Scheduled Tribes.

Sixth Schedule of the Constitution

Article 244(2) of the Constitution allows for the Sixth Schedule, which provides autonomous governance in tribal areas of Assam, Meghalaya, Tripura, and Mizoram.

Key Features:

- Creation of **Autonomous Districts and Regions**.
- Establishment of **District and Regional Councils** with powers in **law-making, judicial matters, and taxation**.

Powers of These Councils Include:

- Making laws on **land use, forest resources, inheritance, and customary laws**.
- Regulating **money lending and trade** within tribal areas.
- Setting up **village courts** to try cases involving only tribal members.
- Managing **education, health, roads, fisheries**, and other local infrastructure.
- Exemption from or modification of **State and Central laws**.

States with Autonomous Districts under Sixth Schedule:

- **Assam:** Karbi Anglong, Bodoland, Dima Hasao
- **Meghalaya:** Khasi Hills, Jaintia Hills, Garo Hills
- **Tripura:** Tripura Tribal Areas District
- **Mizoram:** Chakma, Mara, Lai Districts

Ladakh, despite having a tribal-majority population, **has not been included** in this list.

Conclusion

While the recent regulations for Ladakh are a **welcome attempt** at recognising local concerns, they fall **short of providing robust and permanent safeguards**. Without **constitutional backing**, issues of **land rights, ecological protection, and meaningful self-governance** remain unresolved.

For long-term peace, prosperity, and preservation of Ladakh's unique identity, there is a strong case for **exploring inclusion under the Sixth Schedule** or enacting a **comprehensive constitutional framework** that guarantees **tribal rights, local autonomy, and environmental sustainability**.

EXPECTED QUESTIONS FOR UPSC CSE**Prelims MCQ**

Q. Consider the following states:

- | | |
|-----------------------|--------------|
| (a) Arunachal Pradesh | (b) Sikkim |
| (c) Manipur | (d) Nagaland |

How many of the above are covered under the Sixth Schedule of the Indian Constitution?

- | | |
|--------------|----------------|
| (a) Only two | (b) Only three |
| (c) All four | (d) None |

Answer: (d)

Descriptive Question

Q. Critically examine the recent regulations notified by the Centre for Ladakh in light of the demand for inclusion under the Sixth Schedule of the Indian Constitution. What are the implications for tribal rights, local governance, and ecological preservation? [250 words] [15 marks]

NARCO-ANALYSIS TEST

Why in News: Recently the Supreme Court ruled that narco-analysis tests require consent, cannot solely convict, and infringe on constitutional rights against self-incrimination.

Key Details: Important Highlights of the Judgment

- Emphasising that the pursuit of modern investigative tools **cannot override fundamental constitutional protections**, the Supreme Court underscored that involuntary narco tests infringe upon the right against self-incrimination and personal liberty guaranteed under Articles 20(3) and 21 of the Constitution.
- **Articles 20 and 21 of the Constitution** are non-derogable and sacrosanct rights, and the judiciary cannot carve out exceptions to them.
- **The Court set aside a 2023 Patna high court order** that had accepted an investigating officer's proposal to conduct narco-analysis tests on all accused and witnesses in a dowry harassment case linked to the disappearance of a woman.
 - The court held that the **high court erred in accepting the submission of the police** for administering the test, noting that it contravened the law laid down in the landmark **2010 ruling in Selvi vs State of Karnataka**, where a three-judge bench had declared such techniques unconstitutional if done without consent.
- The bench further stated that permitting such tests without consent **would breach a person's right to privacy** and amount to a disproportionate exercise of police powers.
- A report of a voluntary narco-analysis test with adequate safeguards in place, or information found as a result thereof, cannot form the sole basis of conviction," held the court, referring to the **evidentiary value of discoveries made under Section 27 of the Indian Evidence Act**.

Article 20(3) of the Indian Constitution: Protection against Self-Incrimination

- **No person accused of any offence shall be compelled to be a witness against himself.** Article 20(3) ensures that no person accused of an offence shall be compelled to be a witness against themselves.
- This means that an individual **cannot be forced to provide evidence or testimony that may incriminate themselves**. It is a fundamental right that protects individuals from being compelled to be witnesses in their own criminal prosecution.
- Prohibition against self-incrimination could only be put into effect if the person is accused of a **criminal offence**.

Article 21 of the Indian Constitution: Protection of life and personal liberty

- No person shall be deprived of his life or personal liberty except according to procedure established by law.

- This means that every individual has the right to live, and their life cannot be taken away except in accordance with the prescribed legal procedures.
- The right to life encompasses various aspects, including **the right to live with dignity, the right to livelihood, and the right to a healthy environment.**
- Article 21 also protects the personal liberty of individuals. It states that no person shall be deprived of their personal liberty except according to the procedure established by law.

Narco Analysis Test

- In a narco analysis test, the accused is administered **sodium pentothal**, a drug that induces a hypnotic or sedated state by suppressing their imagination.
- In this condition, the person is believed to be **unable to lie and is expected to reveal truthful information.**
- In India, such tests have been prominently conducted during investigations into the 2002 Gujarat riots and the 26/11 Mumbai terror attacks.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Narco-Analysis and constitutional protections in India:

1. Involuntary administration of narco-analysis violates both Article 20(3) and Article 21 of the Constitution.
2. The Supreme Court has ruled that even a voluntary narco-analysis test with safeguards can form the sole basis of conviction under Section 27 of the Indian Evidence Act.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Answer: (a)

CONTEMPT OF COURT VS LEGISLATIVE POWER

Why in News: Recently, the **Supreme Court of India clarified that a law passed by Parliament or a State legislature cannot be treated as 'contempt of court'**, even if it relates to a matter already decided by the judiciary. This judgment has brought fresh focus to the delicate balance between the **legislative and judicial wings** of our democracy.

Background of the Case

The verdict came while disposing of a **2012 contempt petition** filed by sociologist **Nandini Sundar** and others.

- In **2011**, the Supreme Court had directed the **Chhattisgarh government** to stop supporting vigilante groups like **Salwa Judum** and arming tribal youth as **Special Police Officers (SPOs)** to fight Maoists.
- Later, the Chhattisgarh government passed the **Chhattisgarh Auxiliary Armed Police Force Act, 2011**, which created a legal framework for recruiting auxiliary armed forces, indirectly legalising the SPOs.

The petitioners argued that this was a **contempt of the earlier Supreme Court order.**

However, the Supreme Court ruled that passing a law, even on a subject previously adjudicated, cannot be termed as contempt of court.

What the Supreme Court Said?

The Court stressed that:

- **Every State Legislature and Parliament has the authority to make laws.**
- As long as a law is not declared unconstitutional by a court, it remains **valid and binding.**
- If someone feels a law violates the Constitution, the proper course is to **challenge it legally in court**, not to treat it as contempt.
- **Legislative powers are plenary (complete within their domain).** Making, amending, or even annulling the basis of an earlier court verdict through legislation is a legitimate legislative function.
- The Court highlighted that **constitutional courts have the authority to examine whether laws conform to the Constitution.** But just passing a law does not amount to interfering with the judiciary's authority.

The Principle of Separation of Powers

The ruling reaffirmed the **Doctrine of Separation of Powers** a core principle of India's constitutional framework:

- **The Legislature** makes laws and can amend or repeal them.
- **The Judiciary** ensures those laws comply with the Constitution and resolves disputes over their validity.
- This system of **checks and balances** ensures that no organ of the State oversteps its limits and democracy functions smoothly.

About the Contempt of Courts Act, 1971

The Act was passed to clearly define what constitutes contempt and how it should be dealt with.

What is Contempt of Court?

There are two types:

Civil Contempt

- When someone **wilfully disobeys a court order** or breaches a commitment made to the court.

Criminal Contempt

- When someone publishes or does something that:
 - Scandalises the authority of the court
 - Prejudices or interferes with a court proceeding
 - Obstructs the delivery of justice in any way

What Does Not Count as Contempt?

The Act clearly exempts:

- Innocent publications
- Fair and accurate reporting of judicial proceedings
- Fair criticism of judicial decisions

Punishment

A person guilty of contempt may face:

- Simple imprisonment up to 6 months
- A fine up to ₹2,000
- Or both

Also, no contempt proceedings can be initiated **after one year** from the date of the alleged contempt.

Note: The Act doesn't apply to **Nyaya Panchayats** or other traditional village courts.

Why This Verdict Matters?

- It maintains the **delicate constitutional balance** between law-making powers of the legislature and the interpretative role of the judiciary.
- Prevents misuse of contempt provisions to suppress **legislative action**.
- Upholds the principle that if a law seems unconstitutional, it should be **challenged through proper judicial review**, not labelled as contempt.

Conclusion

This ruling is a reminder of how **India's constitutional democracy thrives on mutual respect and boundaries among the Legislature, Executive, and Judiciary**. While courts have the power to uphold the Constitution, legislatures too have the right to make laws. The judgment ensures that **legislative independence is preserved while protecting judicial supremacy in constitutional interpretation**.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the Contempt of Courts Act, 1971, consider the following statements:

1. A fair and accurate report of judicial proceedings is exempted from being considered as contempt of court under the Act.

2. The Act allows contempt proceedings to be initiated even against Nyaya Panchayats and other village courts.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (a)

PREVENTIVE DETENTION

Why in News: The Supreme Court has held that the extraordinary measure of preventive detention must not be used as a substitute for criminal prosecution or to bypass orders of bail.

Key Highlights of the Judgment

- A Vacation Bench held that **preventive detention should not be invoked when regular criminal law remedies are sufficient**.
- The court emphasized that **detention laws must not be misused to bypass the regular legal process or to "clip the wings"** of an accused already facing criminal trial.
- The judgment was delivered in an appeal against a **Kerala High Court order upholding preventive detention under the Kerala Anti-Social Activities (Prevention) Act, 2007**.

Key Principles from the Supreme Court's Ruling

- **Extraordinary Power:** The Court articulated that preventive detention is an extraordinary power held by the state.
- **Sparing Use:** It stressed that this power must be used sparingly and must not be used in the ordinary course of nature.
- **Constitutional Basis:** The provision for preventive detention is recognised in the Constitution under Article 22(3)(b).
- **Curtailment of Liberty:** The Court noted that preventive detention curtails an individual's liberty in anticipation of the commission of further offence(s).

About Preventive Detention

- Preventive detention is the detention of an individual to **prevent them from committing a crime**, rather than punishing them for a past offense.
- It's a **pre-emptive measure based on the apprehension** that a person might engage in harmful or disruptive activities.
- This contrasts with punitive detention, which is imposed after a person has been found guilty of a crime.

Important Judgments Related to Preventive Detention in India

- **A.K. Gopalan v. State of Madras (1950):** This foundational case established the constitutional validity of preventive detention laws in India.
 - The Court upheld the constitutional validity of the Preventive Detention Act, 1950
 - Established that Article 19 does not include preventive or punitive detention within its scope
- **Dr. Ram Manohar Lohia v. State of Bihar (1966):** It established crucial distinctions in preventive detention law.
 - The Supreme Court clarified the fundamental difference between “law and order” situations and “public order” disturbances.
 - Established that mere breach of law and order cannot justify preventive detention.
 - Only manifest threats to public order can warrant preventive detention.
- **Maneka Gandhi v. Union of India (1978):** While primarily known for expanding Article 21, this case had significant implications for preventive detention.
 - Significantly broadened the interpretation of personal liberty under Article 21.
 - Established that Article 21 does not exclude Article 19, requiring laws to satisfy both articles.
 - Introduced the concept that a procedure established by law must be fair, just, and reasonable
- **Jasleela Shaji v. Union of India (2024):** This recent Supreme Court decision reinforced the rights of detainees under preventive detention laws.
 - Reiterated that detainees must receive all documents relied upon for detention.
 - Established that failure to provide essential documents violates Article 22(5).
 - Emphasized the duty of authorities to transmit representations promptly.

Constitutional and Legal Provisions Related to Preventive Detention in India

- **Article 22:** Article 22 of the Indian Constitution protects against arrest and detention in certain cases while simultaneously creating exceptions for preventive detention.
- **National Security Act (NSA), 1980**
 - Empowers both central and state governments to detain individuals disrupting public order or obstructing essential supplies and services.
 - Allows detention for up to 12 months if the government determines the individual continues to pose a threat.
- **Conservation of Foreign Exchange and Prevention of Smuggling Activities Act (COFEPOSA), 1974**

- Provides for preventive detention for purposes of conservation and augmentation of foreign exchange and prevention of smuggling activities.
- Allows detention for cases involving smuggling, abetting smuggling, transporting or concealing smuggled goods, and harbouring persons involved in smuggling.
- **Unlawful Activities (Prevention) Act (UAPA), 1967**
 - Originally aimed at the prevention of unlawful activities by associations in India.
 - The 2019 amendment made it possible for the Union Government to designate individuals as terrorists without following a formal judicial process.
 - Criticised for making it harder for arrested individuals to obtain bail.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Preventive Detention in India:

1. It allows the state to detain a person without a formal charge or trial, based on the apprehension that they might commit a crime in the future.
2. It is explicitly provided for under Article 22 of the Indian Constitution, which also lays down certain procedural safeguards against its misuse.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

Answer: (c)

JUDICIAL SERVICE RULES

Why in News: In a landmark judgment delivered recently, the **Supreme Court of India** reinstated the **requirement of a minimum three years of law practice** for candidates applying for civil judge posts in the subordinate judiciary. This marks a reversal of the Court’s earlier position from 2002, which had allowed **fresh law graduates** to directly enter the judicial services.

Note: The Court observed that there is “**no substitute for first-hand experience**” when it comes to administering justice. Practical exposure to courtroom functioning is essential for the quality and integrity of the judicial system.

About the Judgement

Key Directives and Requirements

- **Minimum Practice Requirement:** From now on, candidates applying for **civil judge (junior division)** positions must have **at least three years of experience** practicing as a lawyer.

- **Certification of Practice:** This experience must be **endorsed by a senior advocate** who has been a member of the Bar for a minimum of **10 years**.
- **Broader Recognition of Experience:** Experience gained as a **law clerk to judges** will also be counted towards the three-year practice requirement.
- **Post-Entry Training:** All new judicial officers will undergo a **one-year formal training** before being assigned to preside over courts.
- **Exemptions:** The rule **will not apply** in states where the process for appointment of civil judges has already begun before this judgment.
- **State Government Action:** The Court has directed **state governments to amend their judicial service recruitment rules** to implement this new requirement.

Historical Context: How Did This Issue Evolve?

- The matter dates back to the **1993 All India Judges Association vs Union of India case**, in which the Court had recommended that a **minimum of three years of law practice** be mandatory for entering the judiciary. The idea was to ensure judges had a clear understanding of legal procedures and the functioning of courts.
- However, in **2002**, the **All-India Judges’ Association III case** changed this. Based on the findings of the **Justice Shetty Commission**, the Supreme Court decided to **remove the three-year practice requirement**. It was felt that **many top law graduates were opting for jobs in the corporate sector or academia**, and the three-year clause was **discouraging bright young minds** from joining the judiciary.

Why This Change Matters?

This judgment could have far-reaching consequences. It signals a shift towards **experience-based recruitment** in the judiciary. While it might limit the entry of fresh law graduates, it ensures that only those with some understanding of **courtroom dynamics, legal procedures, and practical challenges** enter the judicial services. This is likely to **strengthen the quality of justice delivery**, especially at the grassroots level.

About India’s Subordinate Judiciary

What Are Subordinate or Lower Courts?

Subordinate courts function at the **district level** and are the **first point of contact** for most citizens seeking justice. These include:

- Civil Courts
- Criminal Courts
- Revenue Courts

They operate under the **supervision of the High Court** of the respective state.

Appointments in the Subordinate Judiciary

- **Civil Judges and Magistrates** are appointed by the **Governor** of the state, in **consultation with the Chief Justice of the High Court**.

- Most states conduct **competitive judicial service examinations** through the **State Public Service Commission**.
- To be eligible for a **District Judge**, a person must have been:
 - An **advocate for at least 7 years**, or
 - A **legal officer in government service** with required qualifications.

Structure of the Subordinate Courts

Civil Courts

1. District Court (Court of the District Judge)

- **Highest civil court** in the district.
- Hears **appeals** from sub-judge courts.
- Some **original cases** also begin here.
- Can handle both **civil and criminal cases** (then called **District and Sessions Judge**).

2. Courts of Sub-Judges

- Positioned below the District Judge.
- Handle civil cases involving **larger amounts** than munsiff courts.

3. Family Courts

- Deal specifically with **family-related disputes** like divorce, alimony, and child custody.
- Treated as equivalent to sub-judge courts.

4. Munsif Courts and Small Causes Courts

- Handle **minor civil disputes** and small claims.
- **No appeal** lies against Small Causes Court decisions.

Criminal Courts

1. Sessions Court (Court of the Sessions Judge)

- **Highest criminal court** in a district.
- Can **award capital punishment** but requires confirmation by the **High Court**.
- Handles serious crimes forwarded by magistrates.

2. Courts of Magistrates

- **First, Second and Third Class Magistrates** try less serious offences.
- In metro cities, First Class Magistrates are known as **Metropolitan Magistrates**.
- Can award punishments as per law, or refer serious cases to the Sessions Court.

Revenue Courts

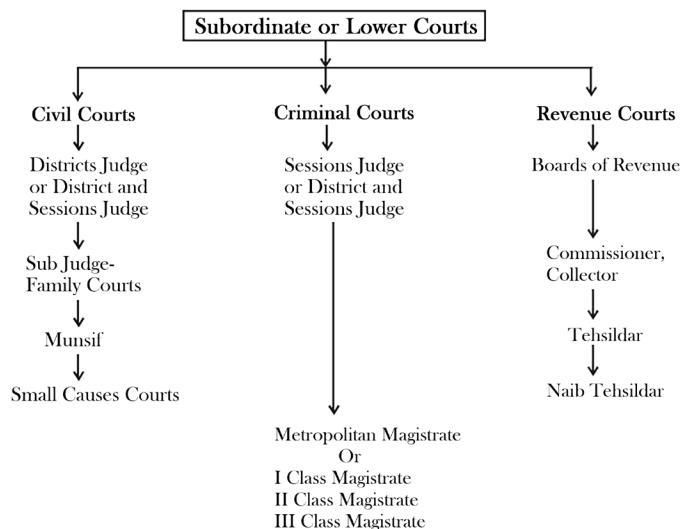
These courts deal with **land and revenue matters** and are not part of the regular civil/criminal judiciary.

1. Board of Revenue

- **Highest revenue court** in the district.

2. Commissioner’s Court, Collector’s Court, Tehsildar’s Court, Assistant Tehsildar’s Court

- Handle land disputes, tenancy issues, and land revenue collection.



Conclusion

The Supreme Court’s recent decision underscores the need to **balance youthful enthusiasm with practical wisdom** in the judicial system. While academic brilliance is important, **first-hand experience in law practice** equips judges with the maturity, empathy, and legal acumen required to handle real-life cases. By reviving the **three-year minimum practice requirement**, the Court has emphasized that the judiciary is not just a job, but a **responsibility** that demands both **knowledge and experience**. It is a reminder that **judicial reforms must not only attract talent but also ensure competence** to protect the ideals of justice in the world’s largest democracy.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. How are subordinate courts structured and regulated within India’s judiciary? What are the specific powers and jurisdictions of subordinate courts? [250 words] [15 marks]

REFORMING THE SUPREME COURT OF INDIA

Why in News: On his last day in office, Supreme Court Judge Justice A.S. Oka raised important concerns about the **functioning of the Supreme Court**, especially regarding the **centralised administrative powers of the Chief Justice of India (CJI)**. He stressed the need to make the judiciary more transparent and less dependent on the unilateral decisions of any one authority.

Justice Oka’s Key Observations

- He reminded the judiciary that a **judge is guided only by the Constitution, the law, and their own conscience**, not by any higher authority or individual.
- He praised former **Justice Sanjiv Khanna** for promoting **transparency through collegial consultations**, where decisions are made collectively.

What Makes the Chief Justice of India So Powerful?

1. Role of the CJI

- The **Chief Justice of India** is the head of the Indian judiciary and is often described as the **“Master of the Roster”** and **“first among equals”**.
- These titles indicate that while the CJI is one of the judges, they hold **special powers in assigning cases, forming benches, and running the administrative functions of the court**.

2. Judicial Backing

- In the **State of Rajasthan v. Prakash Chand (1997)** case, the Supreme Court recognised that the CJI **has the authority to allocate cases and form benches**.

3. Administrative Powers

- Under the **Supreme Court Rules, 2013**, the CJI decides:
 - Which cases go to which benches
 - When and how Constitution Benches are formed
- This gives the CJI significant control over **which legal matters are heard and how quickly or slowly** important constitutional issues are addressed.

4. Power to List Cases

- One of the most important powers of the CJI is the **discretion to list or delay cases**.
- For example, **former CJI N.V. Ramana** was criticised for **not listing Constitution Bench cases** during his tenure.
- In contrast, **CJIs U.U. Lalit and D.Y. Chandrachud** made active efforts to **revive and hear key constitutional matters**.

- He also highlighted that the current **Chief Justice B.R. Gavai** prefers **Full Court meetings** (all judges together) for key decisions, rather than acting alone.
- He suggested that there should be **minimum manual interference in the listing of cases** to avoid bias or delays.
- Importantly, he stressed the need to **strengthen the lower judiciary (district courts)** as these are the first point of contact for common citizens seeking justice.

Efforts to Democratise the Supreme Court

In recent years, several **reforms have been introduced** to make the Supreme Court **more transparent, accountable, and people-friendly**.

1. Public Roster of Judges (2018)

- A **subject-wise allocation of cases** was made public.
- This helped reduce the **arbitrary assignment of sensitive or high-profile cases**.

2. CJI's Office Under RTI (2019)

- In the **Subhash Chandra Agarwal case**, a five-judge bench ruled that the **CJI's office is a public authority under the Right to Information Act**.
- This landmark judgment brought **judicial accountability closer to democratic standards**.

3. Judges' Asset Declarations

- For the first time, judges were required to **publicly declare their assets**, enhancing **trust in their integrity**.

4. Transparency in Judicial Appointments (2025)

- The Supreme Court started **publishing details of the appointment process** for High Court and Supreme Court judges on its website.
- This was a big step towards **making the collegium system more transparent**.

5. Digitisation and e-Courts Mission

- Under the **e-Courts project**, the judiciary adopted:
 - Online case filing
 - Virtual hearings
 - Digital cause lists and orders
- The **National Judicial Data Grid (NJDG)** has made it easier for people to **track case status and access court data**, especially helpful for those in **remote areas**.

Conclusion

Justice A.S. Oka's statement is a **timely reminder** that **true judicial independence comes not just from protecting judges from outside interference**, but also from **ensuring internal transparency and accountability**.

While **recent reforms** are encouraging, the **Supreme Court must continue to reduce excessive concentration of power** in the hands of the Chief Justice and work towards a **more collective, transparent, and citizen-oriented judicial process**.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the implications of centralised administrative powers vested in the Chief Justice of India on the transparency and independence of the judiciary. Evaluate the recent steps taken to democratise the functioning of the Supreme Court. [250 words] [15 Marks]

CIVIL SERVICES REFORMS IN INDIA

Why in News: A recent article in *The Hindu* raised an important question — *“Does the civil services examination need reform?”* This has once again sparked debate on issues like age limits, number of attempts, exam patterns, and the overall purpose of civil services in modern India.

A Brief History of Age Limits and Attempts

During British Rule:

- The debate on age limits for civil services exams began as early as the **19th century**.
- In **1854**, the **Macaulay Committee** recommended a merit-based system, but exams were held in **London**, favouring British candidates.
- In **1876**, the British lowered the upper age limit to **19 years**, making it difficult for Indians to qualify.
- The **Indian National Congress** (formed in 1885) demanded raising it to **23 years** and holding exams in India.

After Independence:

- After 1947, age limits were gradually revised to support **educationally disadvantaged communities**.
- In **1955**, age relaxation was granted to **Scheduled Castes (SCs)** and **Scheduled Tribes (STs)**.
- Following the **Mandal Commission recommendations** in 1995, **Other Backward Classes (OBCs)** also received similar relaxations.
- Today:
 - **32 years** for General category
 - **35 years** for OBCs
 - **37 years** for SC/STs
 - Debates are ongoing for the **EWS (Economically Weaker Sections)** introduced in 2019.

Various Committees and Recommendations

Several expert committees have studied the issue and suggested lowering the upper age limit:

Committee	Recommended Upper Age
Public Services Committee (1955)	21–23 years
Kothari Committee (1976)	26 years
Satish Chandra Committee (1989)	26 years
Yoginder Alagh Committee	26 years
P.C. Hota Committee (2004)	24 years
2nd Administrative Reforms Commission (2008)	25 years

The Debate (Lower Age vs. Retain Current Limits)

Those in favour of lowering age limits argue:

- **Younger candidates** are more open to training and innovation.
- It ensures a **longer service career** and focuses on merit.
- Reduces the exam system's obsession with endless attempts and coaching culture.

Those who want to retain or raise limits argue:

- It **levels the playing field** for rural, socially disadvantaged, and financially weak students.
- Supports **late bloomers** and those who pursue longer technical/professional degrees.
- Seen as a ladder for **social mobility and empowerment** in India's caste and class-based society.

Political and Social Challenges

- Several governments have **ignored expert recommendations** due to the political risk of upsetting a large, vocal, aspirational youth base.
- **Student protests in 2014** forced the government to reverse a reduction attempt and raise the age limit.
- The civil services remain one of India's biggest **symbols of upward mobility and prestige**, especially for underprivileged groups.

How the Exam Pattern Changed Over Time?

- **Kothari Committee (1975)** introduced the current **three-stage process**:
 - Preliminary exam
 - Mains (written)
 - Interview
- In **2011**, the optional subject in the Prelims was replaced with a **common CSAT paper (Paper-II)** on comprehension, reasoning, and maths.
- English-heavy Paper-II drew protests from students from vernacular backgrounds, so it was made **qualifying-only** (33% marks needed, but no contribution to merit rank).
- **General Studies papers** in the Mains were expanded in 2013 to include topics like:
 - Indian Polity
 - Governance
 - Economy
 - Ethics
 - Science & Technology

P.C. Hota Committee's Suggestions for a Better Civil Service

Citizen-Centric Governance:

- Identify key points where citizens deal with the government and improve service quality.
- Officers should be trained in **customer service**, and government offices should have **grievance helplines**.
- Speed up the finalisation and implementation of the **Right to Information (RTI)** rules.
- Revise the **Official Secrets Act** to protect only vital national security interests.

Combat Corruption:

- Frame rules under the **Benami Transactions Act** to confiscate property acquired through corruption.
- Amend **Article 311 of the Constitution** to allow quick dismissal of corrupt public servants after a fair post-decisional hearing.
- Form expert committees under the **Central Vigilance Commission (CVC)** to protect honest officers making bold decisions from harassment.

Conclusion

Reforming India's civil services is not just about changing age limits or exams — it's about making government more:

- Responsive
- Transparent
- Accountable
- Ethical

However, balancing **social justice, meritocracy, and administrative efficiency** in a country as diverse and unequal as India is no easy task. The debate on age limits, attempts, and exam reforms will likely continue, as it involves both **technical reforms and political sensitivities**.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. What are the most significant historical and political factors influencing civil service reforms in India? [150 words] [10 marks]

THE ISRAEL–IRAN CONFLICT

Why in News: Recently, tensions flared up in West Asia after Iran launched ‘Operation True Promise 3’ — firing over 100 missiles at Israel’s major cities like Tel Aviv, Haifa, and Jerusalem. This was in retaliation to Israel’s ‘Operation Rising Lion’, which had targeted important Iranian military and nuclear facilities.

Note: The conflict started after the **International Atomic Energy Agency (IAEA)** passed a resolution accusing Iran of hiding nuclear activities — the first such decision in 20 years. Iran’s counter-strike led to heavy casualties and fresh instability in an already volatile region.

Why Are Iran and Israel in Conflict?

- **Iran’s Nuclear Programme:** Israel sees Iran’s nuclear development as a serious threat to its existence. The IAEA found Iran enriching uranium beyond safe limits under the Non-Proliferation Treaty (NPT).
- **Historical Background:** Iran and Israel were allies before the 1979 Islamic Revolution in Iran. Since then, ties have turned hostile.
- **Support for Proxy Groups:** Iran backs anti-Israel groups like Hamas and Hezbollah and several militias in Iraq and Syria, threatening Israeli security.
- **Religious and Ideological Differences:** Iran is a Shia Islamic theocracy, while Israel is a Jewish state. This deep religious divide fuels mistrust.
- **Geopolitical Rivalry:** Both nations compete for influence in West Asia, backing opposite sides in conflicts like Syria and Yemen.

Why Should India Be Concerned?

- **Energy Security and Trade Routes:**
 - India imports about 40-50% of its crude oil through the Strait of Hormuz. Any tension in this region could:
 - ◆ Disrupt oil and LNG supply.
 - ◆ Increase global fuel prices.
 - ◆ Push up domestic inflation and widen trade deficits.
- **Balancing Diplomatic Relations:**
 - India has good relations with both Israel and Iran. The U.S. and Israel are pressuring other nations to take sides. A reported meeting between former U.S. President Trump and Pakistan’s army chief raised New Delhi’s concerns over shifting regional alliances.

- **Declining Trade:**
 - **Due to sanctions and instability:**
 - ◆ India–Iran trade fell from \$14 billion (2017) to \$1.4 billion.
 - ◆ India–Israel trade declined from \$11 billion (2022) to \$3.75 billion.
- **Impact on Multilateral Diplomacy:**
 - Most Global South nations sympathised with Iran during the Gaza crisis. India’s neutral stand at recent summits like SCO and BRICS is being closely watched.
- **Threat to Indian Diaspora:**
 - Nearly 1.34 crore Indians live in the Middle East, especially in Gulf countries. Rising tensions threaten their safety and livelihoods.
 - India evacuated 3,154 people from Iran under Operation Sindhu due to the worsening situation.

How Has India Responded?

- The Prime Minister spoke with Israel’s PM urging calm and peace.
- The Foreign Minister held separate talks with both Iranian and Israeli counterparts, calling for restraint and diplomacy.
- India issued a neutral statement, avoiding direct criticism of Israel.
- India distanced itself from the SCO’s statement condemning Israel.
- India also abstained from a UN General Assembly vote seeking a ceasefire in Gaza — a shift from its traditional pro-Palestine stand.

What Does This Mean for India’s Foreign Policy?

For India, this conflict is not just about West Asia — it affects:

- Energy security
- Trade stability
- Diplomatic positioning
- Regional influence
- Protection of Indian expatriates

With the U.S. brokering a temporary ceasefire, India has a short window to safeguard its interests. But the situation remains fragile. India must carefully balance its relations with both sides, while maintaining its strategic autonomy and regional standing.

Conclusion

The Israel–Iran conflict is a classic example of how faraway tensions can directly affect India’s energy supplies, diaspora, economy, and international positioning. As a major power in the Global South and a rising voice in the Indo-Pacific, India’s strategy of maintaining *balanced, independent diplomacy* will be tested in the coming months.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. The Israel–Iran conflict poses a multidimensional foreign policy challenge for India, involving energy security, trade, regional diplomacy, and strategic autonomy. In the light of recent developments, critically examine India’s response to the conflict and discuss the implications for its foreign policy and regional interests. [250 Words] [15 Marks]

RUSSIA–INDIA–CHINA (RIC) TROIKA

Why in News: Recently, **Russian Foreign Minister Sergey Lavrov** expressed interest in reviving the **Russia–India–China (RIC) trilateral dialogue**, a forum that had seen reduced activity in recent years due to rising tensions, especially between India and China.

What is the RIC Troika?

- The idea of RIC was first proposed in the **late 1990s** by former Russian Prime Minister **Yevgeny Primakov**. It aimed to bring together three of the world’s most powerful non-Western countries — **Russia, India, and China** — for regular dialogue and cooperation.
- The goal was to build a **multipolar world order**, offering an alternative to Western-dominated global institutions. The first formal meeting took place in **2005 in St. Petersburg**. Eventually, this platform laid the foundation for expanding partnerships like **BRICS (with Brazil and South Africa)**.
- Over time, RIC expanded beyond just foreign ministers’ meetings to include discussions on **trade, finance, and strategic affairs** among the three nations.

Why Is RIC Important for India?

Strategic Importance:

RIC helps India maintain its **strategic autonomy** — meaning, India is free to maintain ties with both the West (like the US and Europe) and non-Western powers like Russia and China. It also allows India to access **Eurasian markets and infrastructure projects**, strengthening its regional influence.

Economic Potential:

The combined economic strength of RIC countries represents over **33% of global GDP**. This forum can promote:

- New trade routes like the **International North-South Transport Corridor (INSTC)**
- **Energy cooperation** (Russia as supplier, India as consumer, and China as transit partner)
- Joint investments in **infrastructure and technology**

Multilateral Influence:

RIC boosts India’s voice in international groups like **BRICS, SCO, and G20**. It provides India a platform to:

- Raise concerns about **terrorism**
- Support reforms in global bodies like the **United Nations**
- Push for a **balanced, multipolar world order**

Challenges Facing the RIC Format

While the idea holds promise, several issues hinder its smooth functioning:

- **India–China Border Disputes:**
 - The lingering tensions along the **LAC (Line of Actual Control)**, including incidents like the **2020 Galwan clash**, have seriously strained trust between India and China, affecting trilateral cooperation.
- **Different Strategic Priorities:**
 - India is actively part of the **Quad (with the US, Japan, and Australia)**, which is seen as a counter to China’s growing power. Meanwhile, Russia has moved closer to China, creating an imbalance within the RIC grouping.
- **Ideological Differences:**
 - India, as the world’s largest democracy, often differs with **authoritarian regimes like China and Russia** on issues such as governance models, press freedom, and international law.
- **External Pressures:**
 - Western powers, especially the **United States**, influence India’s foreign policy through defence deals, economic ties, and regional cooperation. Additionally, **sanctions on Russia** and the **US-China rivalry** complicate trilateral dynamics.

What’s the Way Forward?

To revive and strengthen RIC, these steps could be taken:

- **Resolve India–China Border Issues:** Through consistent dialogue, confidence-building measures, and avoiding military escalations.
- **Focus on Economic Collaboration:** In areas like **energy, digital infrastructure, and connectivity projects** through platforms like the **New Development Bank**.

- **Balance Multilateral Engagements:** India should carefully maintain ties with both RIC and Western-led groupings like Quad, upholding its **strategic independence**.
- **Promote Cultural and Academic Exchanges:** Encouraging people-to-people connections, student exchanges, and collaborative research to build trust beyond politics.

Conclusion

The *Russia-India-China (RIC) trilateral grouping* remains an important, though challenging, diplomatic platform. It offers India valuable opportunities to engage two powerful neighbours while preserving its *independent foreign policy stance*. Despite hurdles like border tensions and shifting alliances, RIC can serve as a forum for promoting a *fairer, multipolar world order* and addressing regional issues if managed with strategic foresight.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. How does the RIC troika’s purpose and function align with or diverge from India’s strategic autonomy? Discuss the most significant internal and external challenges hindering effective RIC cooperation. [250 words] [15 Marks]

INDIA-CENTRAL ASIA RELATIONS

Why in News: India’s ties with Central Asia received renewed focus during the recent **India-Central Asia Dialogue**, where the **Foreign Ministers of Central Asian countries** strongly condemned the **terrorist attack in Pahalgam (April 2024)**. They expressed their **solidarity with India** and reaffirmed their **commitment to fight terrorism together**.



Historical Background

The relationship between **India and Central Asia** is rooted in **deep historical and cultural connections**:

- Since the **3rd century BCE**, both regions were connected via the **Silk Road**, facilitating trade, culture, and knowledge exchange.
- During the **Soviet era**, India maintained cordial relations with the region, especially with the **USSR**, of which these countries were a part.
- After the **collapse of the Soviet Union in 1991**, India established **diplomatic relations** with all five Central Asian Republics: **Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan**.

Strategic Importance of Central Asia for India

- **Regional Stability**
 - Central Asia lies in a **geopolitically sensitive zone**, surrounded by countries like **Afghanistan, Pakistan, and Iran**.
 - Cooperation with Central Asia is crucial for India to **counter terrorism**, ensure **regional security**, and prevent **extremist ideologies** from spreading.
- **Connectivity and Communication**
 - Central Asia acts as a **strategic land bridge** between **Asia and Europe**.
 - India is part of the **Ashgabat Agreement**, a **multimodal transport agreement** involving **Iran, Oman, Turkmenistan, Uzbekistan, and Kazakhstan**. It aims

to create a seamless **transport corridor** from **Central Asia to the Persian Gulf** via **Chabahar Port** in Iran.

- **Energy Security**
 - Central Asia is rich in **natural resources** like **natural gas, oil, uranium, and coal**.
 - Strengthening energy partnerships with the region can help India **meet its growing energy demands** in a cost-effective and stable manner.
- **Agricultural Cooperation**
 - The region's **vast fertile lands** offer opportunities for **collaboration in agriculture**, which can benefit India's **food security** and promote **agri-tech exchange**.
- **Trade and Investment**
 - India can use **Chabahar Port** to access **landlocked Central Asia**, bypassing Pakistan.
 - There is strong potential for **increasing trade**, especially in **pharmaceuticals, textiles, machinery, and technology**.

Developmental and Technical Cooperation

India has launched multiple initiatives to support **economic development** in Central Asia:

- **Line of Credit:** India has offered a **\$1 billion Line of Credit** to support development projects in **energy, healthcare, IT, education, agriculture, and connectivity**.
- **ITEC Program:** Under the **Indian Technical and Economic Cooperation (ITEC)** program, India provides **training, capacity building, and technical expertise** in areas such as **banking, information technology, and remote sensing**.

Recent Diplomatic Developments

- The **India-Central Asia Dialogue**, chaired by **External Affairs Minister Dr. S. Jaishankar**, reflected **strong consensus** on the need to fight **terrorism**.
- The ministers emphasized that **"perpetrators, organisers, financiers and sponsors of terrorist acts must be held accountable."**
- Central Asia's **firm support to India** following the **Pahalgam attack** signals the deepening of **political trust and mutual commitment to peace**.

Way Forward

To enhance engagement with Central Asia, India should focus on the following steps:

- **Infrastructure and Connectivity**
 - Invest in developing **logistics and transport corridors**, especially through **Chabahar Port** and **International North-South Transport Corridor (INSTC)**.
 - Encourage joint projects in **railway, roads, and air connectivity**.
- **Counter-Terrorism Cooperation**
 - Enhance collaboration through mechanisms like the

India-Central Asia Joint Working Group on Counter Terrorism.

- Share **intelligence**, conduct **joint training programs**, and dismantle **terrorist financing networks**.
- **Trade and Business Facilitation**
 - Strengthen the **India-Central Asia Business Council (ICABC)** to promote **SME collaboration**, simplify **business laws**, and **boost investments**.
 - Encourage **cross-border e-commerce, banking linkages, and customs harmonisation**.
- **Engagement in Afghanistan**
 - Collaborate in **rebuilding Afghanistan**, focusing on **infrastructure, education, women's rights, and economic development**, to ensure **regional stability**.
- **Trade Agreement**
 - Push forward the signing of a **Free Trade Agreement (FTA)** with the **Eurasian Economic Union (EAEU)** to **unlock trade potential**.
- **Multilateral Forums**
 - Expand India's role in regional platforms like the **Shanghai Cooperation Organisation (SCO)**, **Eurasian Economic Community (EEC)**, and others to **enhance diplomatic visibility and coordination**.

Conclusion

India's engagement with Central Asia is gaining **strategic momentum**. While challenges like **connectivity barriers** and **regional instability** persist, recent developments show that **India is on the right path**. Deepening ties with Central Asia not only ensures **India's energy and security interests**, but also establishes it as a key player in **Eurasian geopolitics**.

To fully realize the potential of this partnership, India must maintain the current pace of engagement and **convert diplomatic goodwill into tangible outcomes**.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. Discuss the strategic significance of India-Central Asia relations in the context of regional stability, connectivity, and energy security. What steps should India take to enhance its engagement in the region? [250 words | 15 marks]

INDIA-JAPAN TO DEEPEN MARITIME COOPERATION

Why in News: India and Japan have agreed to expand their maritime partnership, focusing on shipbuilding, port development, smart islands, and maritime skill-building. This decision was made during bilateral talks in Oslo between India's Union Minister **Sarbananda Sonowal** and Japan's Vice Minister **Terada Yoshimichi**.

Key Highlights of the India–Japan Maritime Cooperation Meeting

Investment and Industrial Collaboration

- Both nations discussed Japanese investments in India's shipbuilding sector.
- Plans were made to work together on **green ports, port digitisation, and R&D (Research & Development)**.
- Discussions also included offering more job opportunities for **Indian seafarers in Japan**.

Smart Islands Development

- India and Japan explored ideas to develop **Andaman & Nicobar Islands and Lakshadweep as Smart Islands**.
- Focus will be on sustainable technology, disaster-resilient infrastructure, and better connectivity for these strategic islands.

Shipyards Partnerships and Greenfield Investments

- There's a plan to increase collaboration between Indian and Japanese shipyards.
- Japan is considering **Greenfield investments**, like the proposed **Imabari Shipbuilding unit in Andhra Pradesh**.
- Both sides are also interested in co-developing **ports and industrial clusters as clean energy hubs**.

Maritime Heritage Museum Collaboration

- India sought Japan's help in developing the **National Maritime Heritage Museum (NMHC) at Lothal in Gujarat**.
- This museum will showcase India's ancient maritime history and boost tourism, research, and education in the maritime sector.

Maritime Skill Development and Human Resource Cooperation

- With over **1.54 lakh trained seafarers in India**, Japan showed interest in structured programs for training, upskilling, and employing Indian maritime professionals.
- India also offered support to train Indian engineers and maritime workers under Japanese initiatives.

India–Japan Relations (A Strong Special Strategic and Global Partnership)

India and Japan share a **deep-rooted friendship based on cultural, spiritual, and civilisational ties**. Over time, this has evolved into a **multi-dimensional partnership**.

- **Act East Forum (2017)**
 - Promotes cooperation under India's **Act East Policy** and Japan's **Free and Open Indo-Pacific Vision**.
 - Focuses on connectivity, infrastructure, industrial links, and cultural exchanges in India's North-East.
- **Civil Nuclear Cooperation (2016)**
 - A landmark agreement for peaceful use of nuclear energy, which came into force in 2017.
- **Defence Cooperation**
 - Includes joint military exercises and agreements on defence equipment, maritime security, and sharing classified information.

- **Notable agreements:**
 - Joint Declaration on Security Cooperation (2008)
 - Reciprocal Provision of Supplies and Services Agreement (2020)

Economic and Trade Relations

- The **India–Japan Comprehensive Economic Partnership Agreement (CEPA)** covers trade in goods, services, investments, and more.
- Bilateral trade stood at **US\$ 21.96 billion in 2022–23**.
- **Space Cooperation**
 - ISRO and JAXA (Japan's space agency) collaborate on **space research, lunar exploration, and satellite navigation**.
- **Education and Cultural Exchanges**
 - India and Japan actively promote **student and scholar exchanges**, language programs, and cultural festivals.

Why India–Japan Maritime Cooperation Matters?

Strategic Maritime Advantage

- Both countries share concerns about **China's growing influence in the Indian Ocean**.
- Their cooperation strengthens **India's Indo-Pacific strategy**, which focuses on free, open, and secure sea routes.

Green and Smart Shipping

- Aligns with India's **Maritime India Vision 2030** and **Amrit Kaal Vision 2047**.
- Emphasises **sustainable, environment-friendly port development and shipping**.

Job Creation and Skill Development

- By leveraging India's large pool of trained seafarers, the partnership opens new job opportunities in the global maritime sector.
- Joint programs for training and skill development will enhance employability.

Technology and Innovation Transfer

- Joint ventures in **shipbuilding and port management** will help India access advanced Japanese technology and R&D expertise.

Regional and Geostrategic Synergy

- Strengthens regional groupings like **QUAD, Supply Chain Resilience Initiative (SCRI), Asia-Africa Growth Corridor (AAGC)**, and more.
- Supports India's **Act East Policy** and long-term maritime goals.

Conclusion

India–Japan relations have steadily grown into a **strong, future-focused partnership**. The new maritime cooperation plan adds another valuable layer to this relationship,

promoting **security, sustainable growth, clean energy, and skill development.**

As India works towards becoming a leading maritime power by 2047, **Japan remains a trusted partner** in realising this vision, ensuring a **peaceful and prosperous Indo-Pacific region.**

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the significance of India–Japan maritime cooperation in the context of India’s Indo-Pacific strategy and maritime development goals. [250 words] [15 marks]

INDIA-CANADA RELATIONS

Why in News: After nearly two years of diplomatic tensions, **India and Canada** are now taking important steps to **reset their strained relationship.** The two countries have agreed to **restore High Commissioners** in Delhi and Ottawa and have held discussions on **resuming trade negotiations, visa services,** and other diplomatic channels.

Sources of Strain in Bilateral Relations

Relations between India and Canada have suffered serious setbacks due to a **mix of political allegations, historical grievances, and national security concerns.**

1. Nijjar Murder Allegations

In **September 2023**, then-Prime Minister **Justin Trudeau** accused **Indian agents** of being involved in the killing of **Canadian Khalistani activist Hardeep Singh Nijjar.** India **strongly rejected** these allegations, calling them politically motivated and unsubstantiated.

2. Allegations of Foreign Interference

Canada also alleged **Indian interference in its electoral processes,** which worsened the diplomatic environment.

3. Diplomatic Expulsions and Visa Suspension

Following these events, both countries **expelled senior diplomats** in **October 2024**, and India **suspended visa services** for Canadian nationals for a period.

4. Legacy of Mistrust and Khalistani Extremism

India has long viewed **Khalistani extremism on Canadian soil** as a serious threat to its national security. The memory of the **1985 Air India bombing,** which killed **331 people** (mostly Canadians of Indian origin), still shapes India’s perception of Canada’s failure to act decisively against such extremism. A **2010 Canadian public inquiry** confirmed these concerns, highlighting investigative failures and lack of accountability.

Why a Reset Is Needed Now?

Despite deep-rooted issues, **shifting global realities** and

shared interests are pushing both nations to look beyond the past.

1. Political Transition in Canada

The departure of **Justin Trudeau** and potential new leadership in Ottawa has created a window of opportunity for a **fresh start.**

2. Changing Geopolitical Landscape

Canada is seeking to **reduce reliance on China and the US** due to rising unpredictability in global affairs. **India, with its growing stability and influence,** offers a strategic and economic alternative.

3. India’s Growing Global Role

India is emerging as a **key player in the Indo-Pacific,** which makes it an attractive partner for Canada, especially as both countries seek to **maintain peace, trade, and balance of power** in the region.

4. Shared Strategic Interests

Both countries aim to **enhance economic cooperation,** counter **extremism,** and jointly respond to **China’s growing assertiveness** in the Indo-Pacific.

Steps Toward Rebuilding the Relationship

1. Restoring High Commissioners

Reinstating High Commissioners is a vital symbolic and practical step, signaling **diplomatic normalcy** and willingness to engage.

2. Resolving the Nijjar Case Diplomatically

India and Canada must find **balanced, legal, and diplomatic approaches** to address the Nijjar issue to avoid further politicisation and mistrust.

3. Tackling Extremism Together

Violent extremism affects both nations. They must collaborate through **reinforced law enforcement, intelligence sharing, and joint condemnation of violence.**

4. Reviving Joint Working Group on Counter Terrorism

The **Joint Working Group on Counter Terrorism (JWG-CT),** active since **1997,** and the **2018 Framework for Cooperation on Countering Terrorism** can serve as effective platforms to build mutual trust and capacity against extremism.

Significance of the G7 Summit

India’s participation in the **G7 Summit** and a productive conversation between **PM Modi and new Canadian leadership** signals a **thaw in relations.**

- It allowed **quiet diplomacy** without the political risks of a formal bilateral meeting.
- The G7’s outreach to **Global South nations** (like India, Brazil, South Africa, and Mexico) shows that global powers are being

compelled to engage with rising democracies.

- For Canada, this is part of a larger shift—**rebalancing its global partnerships** amid uncertainty in traditional alliances.

Economic and Sectoral Ties

Despite tensions, the **economic relationship** between India and Canada remains robust and holds great potential for growth.

- **Trade and Investment**
 - In 2023, total **goods trade** was **CAD 12.65 billion**, with India exporting **pharmaceuticals, electronics, jewellery, and auto parts**.
 - India imported **minerals, pulses, potash, and newsprint** from Canada.
 - **Services trade** stood at **CAD 13.49 billion**, including **education, technology, and finance**.
- **Civil Nuclear Cooperation**
 - A **Nuclear Cooperation Agreement** (2010) and uranium supply agreements reflect trust in sensitive sectors.
 - Both countries also exchange experiences on **nuclear safety** and regulation.
- **Energy and Space Collaboration**
 - An **Energy Dialogue** initiated in 2016 covers **electricity, renewables, and efficiency**.
 - **ISRO and the Canadian Space Agency (CSA)** collaborate on **satellite tracking, launches, and space astronomy**.
- **Science, Tech, and Innovation**
 - Joint committees exist to promote **industrial research, climate studies, healthcare, agriculture biotech, and waste management**.
- **People-to-People Ties**
 - Canada hosts **1.8 million Indo-Canadians** and **1 million NRIs**, forming **over 3% of Canada's population**.
 - The **Indian diaspora** contributes significantly to **Canada's economy, politics, and multicultural fabric**.
- **Cultural Linkages**
 - India and Canada have signed a **film co-production agreement** and regularly engage in cultural exchanges through the **Indian Council for Cultural Relations (ICCR)**.

Conclusion

The India-Canada reset is not just about fixing a broken bilateral tie. It is part of a larger **rebalancing of global partnerships** in a world that is becoming **increasingly multipolar**. With shared values of **democracy, pluralism, and economic ambition**, both countries must move beyond the past and **focus on a future of cooperation**, not conflict.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. What are the core challenges impeding a full reset of Canada-India relations? How can Canada and India leverage shifting global dynamics for mutual benefit? [250 Words | 15 Marks]

INDIA-GERMANY PARTNERSHIP

Why in News: India and Germany are celebrating **25 years of their strategic partnership**, and this milestone comes with new plans to make the relationship stronger, deeper, and more future-ready.

A Look Back (How It Began)

The **India-Germany Strategic Partnership** was formally established in **May 2000**. Over the years, it has grown steadily, covering areas like politics, trade, culture, education, and environment.

Now, on its 25th anniversary, **Germany has released its first-ever official strategy document focused entirely on India**, called **"Focus on India"** — a roadmap to further strengthen ties in a changing global order.

Why Germany is Focusing on India

- **Germany sees India as a vital partner in balancing China's growing power** in Asia and beyond.
- At the same time, it recognises that **India maintains strategic independence**, preferring to stay neutral and work with multiple global powers.

The new strategy document has two aims:

- **Review everything India and Germany are already doing together** in fields like security, climate, technology, and people-to-people ties.
- **Suggest new areas of cooperation** such as joint government consultations, defence collaborations, and climate-friendly energy projects.

Key Pillars of Indo-German Relations

- **Peace and Security**
 - **Both countries want a peaceful, stable, and rules-based international system.**
 - **Germany aims to become a key security partner for India**, expanding defence dialogues and cyber security cooperation.
- **Trade and Economic Ties**
 - **Germany is the world's 3rd largest economy, and India the 4th largest.** Their economic partnership is one of India's most robust.
 - In 2023, trade between the two reached an all-time high of **\$33.33 billion**.

- **Major Indian exports to Germany:**
 - Electrical goods, auto parts, textiles, chemicals, and pharmaceuticals.
- **Major German exports to India:**
 - Machinery, automobiles, aircraft parts, and chemicals.
- **Investment Facts:**
 - Germany is India's **9th largest foreign investor** with over **\$14.5 billion FDI** since 2000.
 - Over **2,000 German companies operate in India**, providing **more than 7.5 lakh jobs**.

People-to-People and Cultural Links

- **Over 50,000 Indian students study in Germany** — the largest group of international students there.
- The **Comprehensive Migration and Mobility Partnership Agreement (MMPA)**, signed in **2022**, makes it easier for Indian professionals and students to work and study in Germany.

Cultural Exchange:

- Rabindranath Tagore's visits to Germany laid the foundation for strong cultural bonds.
- Indian film festivals, yoga events, and cultural fairs like **'Namaste Berlin'** bring Indian traditions to German audiences.
- A life-sized **replica of the Sanchi Stupa** was installed in Berlin, highlighting the historical connection.
- Language and cultural centres like **Max Mueller Bhavan** in India and the **Indo-German Society (DIG)** in Germany actively promote mutual understanding.

Indian Diaspora in Germany:

- About **2.46 lakh Indians and people of Indian origin** live in Germany, working as professionals, researchers, businessmen, nurses, and students.

Green Development and Climate Cooperation

One of the most promising areas of Indo-German ties is **sustainable development and clean energy**.

- Under the **Indo-German Green and Sustainable Development Partnership (GSDP)**, Germany committed **€10 billion in preferential loans and grants over 10 years (starting 2022)**.
- This supports India's green energy transition, sustainable urban development, and eco-friendly transport.

Key Projects:

- **Green Hydrogen Task Force** set up in 2022 to collaborate on producing and using green hydrogen.
- Major financial support for projects like **Nagpur Metro Rail, Green Energy Corridors, and Urban Mobility in Kochi**.
- Climate action is now linked to **energy security and economic cooperation**, making it a central part of Indo-German relations.

Conclusion

As both nations mark **25 years of strategic partnership**, the focus is on adapting to the modern world's new challenges — climate change, energy security, digital transformation, and strategic balance in Asia. The Indo-German friendship is now **more than trade and diplomacy**; it's a relationship built on **shared values, mutual respect, and a common vision for a greener, fairer, and secure world**.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. What are the key policy areas and proposed initiatives strengthening Indo-German relations? [150 words] [10 marks]

INDIA-CYPRUS BILATERAL RELATIONS

Why in News: Prime Minister Narendra Modi's visit to Cyprus in 2025 marked a **historic milestone**, being the **first by an Indian Prime Minister in over two decades**. This visit reaffirmed the **long-standing friendship** and growing strategic cooperation between the two democratic nations.

A Relationship Built on Shared History and Values (Strong Historical Foundations)

- The ties between **India and the Republic of Cyprus (RoC)** have been **warm and cooperative for over 60 years**. The foundation of this relationship was laid by **Jawaharlal Nehru**, India's first Prime Minister, and **Archbishop Makarios**, the first President of Cyprus. Both were **founding leaders of the Non-Aligned Movement (NAM)** and believed in **sovereignty, peaceful coexistence, and non-interference**.
- India was among the **first countries to support Cyprus's independence** from British rule, and diplomatic relations were officially established on **February 10, 1962**. Since then, India has remained a **trusted and supportive friend** of Cyprus.

Strategic Importance and Shared Geopolitical Concerns

1. Message to Turkey

- PM Modi's visit in 2025 also sent a **geopolitical signal**, especially to **Turkey**, which has been increasing its strategic cooperation with **Pakistan**. Cyprus has had a tense relationship with Turkey since the **1974 Turkish invasion** and the declaration of the **Turkish Republic of Northern Cyprus** (recognized only by Turkey).
- India's outreach to Cyprus underlines its **neutral but firm support** for the sovereignty and territorial integrity of Cyprus.

2. Common Stand on Terrorism

- Both countries have a **firm stance against terrorism**. Cyprus **strongly condemned the terror attack in Pahalgam** and expressed **solidarity with India** in its fight against **cross-border terrorism**.

3. Role in Global Connectivity: IMEC

- Cyprus lies on a **key route of the India-Middle East-Europe Economic Corridor (IMEC)**, a major infrastructure initiative to enhance **trade and connectivity** between India, the Gulf region, and Europe. Cyprus could serve as a **crucial gateway** for Indian goods and investments into Europe.

4. Support within the European Union

- Cyprus is a **strong supporter of India in the European Union (EU)**. It is expected to hold the **Presidency of the Council of the EU in early 2026**, offering a window of opportunity for India to strengthen its **trade and security ties** with the EU.

Economic and Commercial Ties

1. Trade and Investment

- **Bilateral trade** stood at **USD 136.96 million** between April 2023 and March 2024.
- **Cyprus is among the top 10 foreign investors in India**, with **USD 14.65 billion** in cumulative FDI (**April 2000–March 2025**). Key sectors include:
 - Information Technology
 - Financial Services
 - Automobile manufacturing
 - Real Estate
 - Pharmaceuticals

2. Economic Cooperation Mechanisms

Several frameworks support the economic partnership:

- **Joint Economic Committee (JEC)**: Focuses on trade, industry, science, and investment cooperation.
- **Cyprus-India Business Association (CIBA)**: Promotes business collaboration.
- **MoU between Invest India and Invest Cyprus (2021)**: Encourages mutual investment flows.
- **Regional Chamber MoUs**: Promote local business ties in cities like Goa, Bangalore, and Limassol.
- **India-Greece-Cyprus (IGC) Business and Investment Council (2025)**: Accelerates trilateral cooperation in **infrastructure, shipping, technology, and financial services**.

3. Taxation and Investment Framework

- A **revised Double Taxation Avoidance Agreement (DTAA)** was signed in **2016**, ensuring clarity and fairness in taxation, especially for capital gains.
- Cyprus is one of the few **non-FATF countries approved for Category-I FPI license**, allowing its investment funds easier access to Indian markets.

Defence and Security Cooperation

- An **MoU on Defence Cooperation** was signed in **December 2022**.
- A **Bilateral Defence Cooperation Programme (BDCP)** was signed in **January 2025**, enhancing defence dialogue, training, and maritime cooperation.

Cultural Ties and People-to-People Contacts

- India and Cyprus share **rich cultural traditions** and **common values** like democracy, non-violence, and rule of law. Cultural exchanges, education programs, and tourism continue to strengthen **people-to-people bonds**.

Way Forward

To further deepen the partnership, **India and Cyprus should:**

- **Enhance Strategic Dialogue**: Regular high-level visits and strategic consultations.
- **Promote Multilateral Cooperation**: Leverage Cyprus's role in the EU and its regional influence.
- **Expand Defence Collaboration**: Focus on maritime security, cyber security, and joint training.
- **Boost Trade and Investment**: Utilize the IGC Business Council to tap into sectors like digital economy and renewable energy.
- **Support Connectivity Projects**: Collaborate on initiatives like IMEC for mutual economic benefits.

Conclusion

The India–Cyprus partnership is anchored in **shared history, common values, and mutual respect**. As Cyprus prepares to assume the **EU Council Presidency in 2026**, India's strategic engagement with the island nation holds great potential for **regional connectivity, economic growth, and global cooperation**. The recent visit by PM Modi not only rejuvenated bilateral ties but also placed India as a **reliable partner in the Mediterranean region**.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. What are the core pillars and shared values underpinning the Cyprus-India partnership? [150 words] [10 marks]

INDIA–KYRGYZ REPUBLIC BILATERAL INVESTMENT TREATY (BIT)

Why in News: India and the Kyrgyz Republic have officially brought into effect a new **Bilateral Investment Treaty (BIT)** by exchanging the **Instrument of Ratification**. This move marks a **significant step in deepening economic and investment relations between the two friendly nations**.

What is a Bilateral Investment Treaty (BIT)?

A **Bilateral Investment Treaty (BIT)** is a formal agreement between two countries. Its main purpose is to:

- **Promote and protect investments** made by investors from one country in the territory of the other.
- Ensure a **safe, predictable, and fair investment environment**.
- Strike a balance between **investor rights** and the **host country's authority to regulate its own economy and policies**.
- Encourage **sustainable and responsible investment** that contributes to economic growth.

Timeline of the India–Kyrgyz Republic BIT

- **First BIT:** Came into force on **May 12, 2000**.
- **New BIT Signed:** On **June 14, 2019** in Bishkek, Kyrgyzstan.
- **New BIT Enforced:** From **June 5, 2025**, replacing the earlier agreement.

Why This Treaty Matters?

This updated BIT reflects modern global investment practices and India's revised investment treaty policy. It ensures:

- **Protection for Indian and Kyrgyz investors** in each other's territories.
- Fair conditions for investment while safeguarding both countries' **sovereign policy-making rights**.
- Promotion of **sustainable, transparent, and responsible investments**.

Key Features of the New BIT

- **Focus on Sustainable Development**
 - The new treaty directly acknowledges the importance of **sustainable development**, making it part of its core objectives.
- **No Most-Favoured-Nation (MFN) Clause**
 - Earlier BITs often had an MFN clause, which allowed investors to claim better treatment if any other country received it.
 - **This BIT removes the MFN clause**, preventing misuse and ensuring fair but balanced treatment.
- **Enterprise-Based Definition of Investment**
 - Clearly defines what qualifies as an investment.
 - Includes an **inclusion list** (what's covered) and an **exclusion list** (what's not).
 - Recognises key characteristics of investments:
 - ◆ **Involves capital**
 - ◆ Made with expectation of returns
 - ◆ **Involves risk**
 - ◆ **Benefits the host country's development**
- **Preserving Government's Policy Space**
 - Certain sensitive matters are excluded from the BIT's coverage:
 - ◆ **Local government issues**

- ◆ Taxation
- ◆ Government procurement
- ◆ Compulsory licences
- ◆ Services provided directly by the government (like security or policing)

- **Fair Treatment of Investments**

- Ensures foreign investors get fair treatment, protection against unfair expropriation (nationalisation), and freedom to transfer returns, in line with international law.

- **General and Security Exceptions**

- The treaty makes exceptions for national security, public health, environmental protection, and public order.
- This allows both governments to take necessary actions without breaching the BIT.

- **Calibrated Dispute Settlement (ISDS) Mechanism**

- Provides a balanced **Investor-State Dispute Settlement (ISDS)** mechanism.
- Investors must first exhaust all possible local legal remedies before approaching international arbitration.

India's Broader BIT Experience

- India signed **83 BITs** by 2015 (74 were active).
- Realising issues with older treaties, India introduced a new **Model BIT in 2015**.
- This model focuses on protecting **India's regulatory autonomy** while offering fair protection to investors.
- Many old BITs were either **terminated or renegotiated** based on the new model.

What is Arbitration in BITs?

- Arbitration is an out-of-court dispute resolution method where a neutral arbitrator or tribunal settles investment disputes.
- It's a preferred way to resolve cross-border investment disputes fairly and efficiently.

Conclusion

The new **India–Kyrgyz Republic BIT** marks a modern, balanced, and forward-looking agreement between two friendly nations. It ensures **better protection for investors**, promotes **mutually beneficial investments**, and respects both countries' **right to regulate for public interest**. This treaty is not just about economics — it's a step towards **stronger bilateral friendship**, sustainable development, and shared prosperity in Central Asia and South Asia.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. What is a Bilateral Investment Treaty (BIT)? Discuss the significance and key features of the India–Kyrgyz Republic BIT of 2025. [150 words] [10 marks]

ECONOMIC AND SOCIAL COUNCIL OF THE UNITED NATIONS

Why in News: India has been elected to the Economic and Social Council of the United Nations for the term 2026-28.

Key Details

- Alongside India, other countries elected to the council include Australia, Burundi, Chad, China, Ecuador, Finland, Lebanon, Mozambique, Norway, Peru, Sierra Leone, Saint Kitts and Nevis, Türkiye, and Turkmenistan.
- The terms for all new members are set to begin on January 1, 2026.
- **Membership in ECOSOC is distributed** to ensure fair geographical representation among five regional groups: African States, Asia-Pacific States, Eastern European States, Latin American and Caribbean States, and Western European and other States.

About Economic and Social Council (ECOSOC)

- ECOSOC is **one of the six primary organs of the United Nations**.
- The Economic and Social Council (ECOSOC) deals with economic, social, cultural and health matters as well as human rights and fundamental freedoms. It also coordinates the work of the UN and the specialised agencies.
- **Chapter X, Articles 61-72**, of the UN Charter concern ECOSOC.
- **Composition**
 - The Economic and Social Council consists of **fifty-four Members of the United Nations** elected by the General Assembly.
 - **Eighteen members of the Economic and Social Council are elected each year** for a term of three years. A retiring member is eligible for immediate re-election.
 - Each member of the Economic and Social Council has one representative.
- **Voting**
 - Each member of the Economic and Social Council has one vote.
 - Decisions of the Economic and Social Council are made by a majority of the members present and voting.
- **Functions and Powers**
 - **Research and Reporting:** Make or initiate studies and reports with respect to international economic, social, cultural, educational, health, and related matters and may make recommendations with respect to any such matters to the General Assembly to the Members of the United Nations, and to the specialised agencies concerned.

- **Promotion of Human Rights:** Make recommendations for the purpose of promoting respect for, and observance of, human rights and fundamental freedoms for all.
- **Drafting International Conventions:** Prepare draft conventions for submission to the General Assembly, with respect to matters falling within its competence.
- **Convening International Conferences:** It may call, in accordance with the rules prescribed by the United Nations, international conferences on matters falling within its competence.
- **Coordination with Specialised Agencies:** Coordinate the activities of the specialised agencies through consultation with and recommendations to such agencies and through recommendations to the General Assembly and to the Members of the United Nations.
- **Oversight of Agency Reporting:** Take appropriate steps to obtain regular reports from the specialised agencies.
- **Support to the Security Council:** It may furnish information to the Security Council and shall assist the Security Council upon its request.
- **Implementation of General Assembly Recommendations:** Perform such functions as fall within its competence in connection with the carrying out of the recommendations of the General Assembly.

Conclusion

India's election to ECOSOC enhances its role in shaping global socio-economic policies and strengthens its voice in multilateral platforms. As ECOSOC plays a central role in promoting inclusive development and human rights, India's presence offers an opportunity to contribute meaningfully to global governance and sustainable development goals.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the United Nations Economic and Social Council (ECOSOC):

1. ECOSOC is one of the six principal organs of the United Nations and is responsible for coordinating economic, social, and human rights-related activities.
2. All 193 UN member states are permanent members of ECOSOC with equal voting rights.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

(a) Answer

Descriptive Question

Q. India has been elected to the UN Economic and Social Council (ECOSOC) for the 2026–28 term. Why is this significant for India's global role? Briefly explain the key functions and mandate of ECOSOC. [250 words] [15 marks]

INDIA AND THE G7

Why in News: Prime Minister Narendra Modi attended the **51st G7 Summit**, held in **Canada**, marking another milestone in India's growing engagement with major global powers. Although **India is not a formal member** of the **Group of Seven (G7)**, its regular participation reflects its rising influence in international affairs.

India's Association with G7 Summits

- India has been **invited as a guest country** to the G7 Summit **twelve times** so far.
- This was **PM Modi's sixth consecutive invitation**, showing India's strategic importance on the global stage.
- **Previous summits attended by India include:**
 - **France** (2003, 2019)
 - **UK** (2005, 2021)
 - **Russia** (2006)
 - **Germany** (2007, 2022)
 - **Japan** (2008, 2023)
 - **Italy** (2009, 2024)

Why Is India Invited?

The **host country** of the G7 Summit often invites **non-member nations** to participate in outreach sessions based on:

- Strategic partnerships
- Regional significance
- Relevance to global issues
- Emerging economic importance

India, as a **leading voice of the Global South**, plays a crucial role in bridging the gap between developing and developed nations.

Key Highlights from PM Modi's Address at the G7 Outreach Session

Energy Security

PM Modi identified **energy security** as a key global challenge. He emphasised India's approach based on:

- Availability
- Accessibility
- Affordability
- Acceptability (environmental sustainability)

Sustainability and Climate Action

India is one of the **fastest-growing major economies**, yet it:

- **Met its Paris Climate Agreement targets ahead of schedule**
- Launched global green initiatives like the:
 - International Solar Alliance (ISA)
 - Mission LiFE (Lifestyle for Environment)
- PM urged developed nations to **support these efforts** through finance and technology transfer.

Voice of the Global South

PM Modi positioned India as a **spokesperson for the Global South**, stressing that:

- Many developing countries are **most affected by global crises** (like pandemics, climate change, conflict).
- Their **needs and aspirations must shape global decisions** for a sustainable and inclusive future.

Fight Against Terrorism

- PM condemned the **Pahalgam terror attack** and called for:
 - **Zero tolerance** against terrorism
 - **Action against state sponsors of terror**
 - **No double standards** in the global fight against terrorism

Technology and AI

PM highlighted the need for:

- **Human-centric artificial intelligence**
- **Green and sustainable AI solutions**
- **Secure and diverse supply chains** for critical minerals
- India's **large, diverse datasets** as valuable for developing **responsible AI**

International Cooperation

The address concluded with a call for:

- **Greater global cooperation**
- A **technology-led development model**
- A **people- and planet-centric approach** to progress

About the G7

The **Group of Seven (G7)** is an **informal grouping** of:

- **Seven of the world's most advanced economies**, and
- The **European Union** (as a non-rotating participant)

Current Members:

1. United States
2. United Kingdom
3. France
4. Germany
5. Italy

6. Japan
7. Canada

History and Evolution of the G7

- **1975:** Initially formed as the **Group of Six (G6)**—France, Germany, Italy, Japan, UK, and USA—to tackle global economic crises.
- **1976:** **Canada** joined, forming the G7.
- **1980s:** The agenda expanded to include **security, human rights, and global peace.**
- **2000s onwards:** Focused on **climate change, gender equality, engagement with developing nations, and disarmament programs.**
- The EU participates in all meetings but **does not host** summits or assume the presidency.

Why G7 Still Matters?

Even though emerging economies like India, China, and Brazil are not part of it, the G7 remains:

- A **powerful platform** for shaping global economic policies
- A **forum for consensus-building** on climate action, health crises, financial systems, and security
- A **stage for collaboration** with guest countries on global challenges

Conclusion

India's participation in the G7 summit *reflects its growing global stature* and strategic importance. By addressing issues like *energy security, climate change, terrorism, and digital transformation*, India is making meaningful contributions to *global governance*.

As the *voice of the Global South*, India is ensuring that the concerns of developing countries are *heard and addressed* in high-level global forums. Its engagement with the G7 marks a *balanced, future-oriented diplomacy* rooted in sustainability, cooperation, and inclusivity.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following countries:

1. USA
2. UK
3. UAE
4. Japan
5. South Korea
6. Australia
7. Canada

Which of the above countries are members of the Group of Seven (G7)?

- (a) 1, 2, 3 and 4 only (b) 4, 5, 6 and 7 only
(c) 1, 2, 6 and 7 only (d) 1, 2, 4 and 7 only

(d) Answer

FINANCIAL ACTION TASK FORCE (FATF)

Why in News: India will send a dossier to the Financial Action Task Force (FATF) before its plenary meeting in June to push for the re-inclusion of Pakistan in its 'grey list' of countries that are subject to increased scrutiny.

Key Details

- The Indian government will also oppose further World Bank funding to Pakistan.
- In 2022, Pakistan was removed from the list and one of the conditions was that it would enact an anti-terror law. That law hasn't come, so the FATF itself has enough reason to put Pakistan back on the list. India's dossier will add to this.
- India has been arguing that the security establishment of Pakistan has a direct link to terror outfits like **the Lashkar-e-Taiba and Jaish-e-Mohammed** that carry out cross-border terror attacks against Indian citizens, and that the terror link makes a compelling case to put all financial assistance to Pakistan under increased scrutiny.
- India has already made a round of **submissions to the Monitoring Team of the 1267 Sanctions Committee of the UN Security Council** earlier in May. India's campaign to squeeze Pakistan on the financial front is expected to intensify in the coming months.


About Financial Action Task Force (FATF)

- FATF was **established in 1989 by the G7 nations** with the primary goal of tackling money laundering. In 2001, its scope was broadened to include countering terrorist financing. The organisation is **headquartered in Paris, France.**
- The Financial Action Task Force is an **autonomous international body** that formulates and advances policies aimed at safeguarding the global financial system from threats such as money laundering, terrorist financing, and the funding of weapons of mass destruction.
- Its guidelines, known as the FATF Recommendations, serve as the international benchmark for **anti-money laundering (AML) and counter-terrorist financing (CFT)** measures.




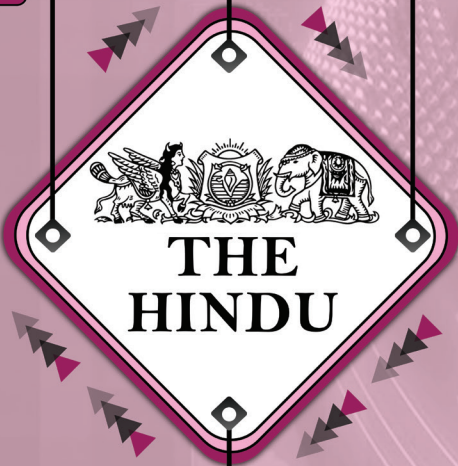
Functions of FATF

- **Leading Global Action Against Illicit Financing:** The Financial Action Task Force (FATF) leads global action to tackle money laundering, terrorist and proliferation financing. The FATF researches how money is laundered and terrorism is funded, promotes global standards to mitigate the risks, and assesses whether countries are taking effective action.
- **Monitoring Illicit Financial Flows:** FATF keeps track of how criminals and terrorists generate, move, and use illicit funds. It regularly publishes reports highlighting emerging techniques, enabling governments and the private sector to counter evolving threats effectively.
- **Addressing Emerging Threats:** The FATF also works to stop funding for weapons of mass destruction. The FATF continuously strengthens its global standards to address new risks, such as the regulation of virtual assets, which have spread as cryptocurrencies gain popularity.
- **Global Monitoring and Evaluation:** The FATF monitors countries to ensure they implement the FATF Standards fully and effectively. In total, more than 200 countries and jurisdictions have committed to implement the FATF's Standards and they are assessed with the help of nine FATF Associate Member organisations and other global partners, the IMF and World Bank.
- **Accountability through Grey and Black Lists:** The FATF holds countries to account that do not comply with the FATF Standards. If a country repeatedly fails to implement FATF Standards then it can be named a Jurisdiction under Increased Monitoring or a High Risk Jurisdiction. These are often externally referred to as "the grey and black lists".

Free Initiative by Chahal Academy 

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ECONOMY & AGRICULTURE

INDIA BECOMES THE 4TH LARGEST ECONOMY

Why in News: India has overtaken Japan to become the world's fourth-largest economy, NITI Aayog Chief Executive Officer (CEO) BVR Subrahmanyam said, citing data by the International Monetary Fund.

Current Global Economic Standing

- **Ranking and Displacement:** India has officially surpassed Japan to become the world's fourth-largest economy. Until 2024, India held the position of the fifth-largest economy globally.
- **Current GDP Valuation:** India's GDP currently stands at \$4.3 trillion, slightly ahead of Japan's estimated \$4.187 trillion.
- **Top Global Economies:** Following India's ascent, only the United States, China, and Germany maintain larger economies. The United States' GDP for 2025 is pegged at \$30.5 trillion, while China's is around \$19.2 trillion.

Future Economic Projections and Growth Drivers

- **Path to Third Largest Economy:** India is poised to displace Germany from the third rank in the next 2.5 to 3 years. Some reports indicate this could happen by 2027, or by 2028 when India's GDP is projected to increase to \$5.5 trillion.
- **Projected GDP Growth and Timeline:** India's economy has more than doubled since 2015, when its GDP was \$2.1 trillion. The IMF estimates India's nominal GDP for fiscal 2026 to be around \$4,187.017 billion.
- **Growth Rates and Global Comparison:** India is projected to remain the world's fastest-growing major economy. It is the only country expected to achieve over 6% growth in the next two years. Specifically, India's economy is expected to grow by 6.2% in 2025 and 6.3% in 2026, maintaining a significant lead over global and regional peers. In contrast, the IMF projects global economic growth to be much lower, at 2.8% in 2025 and 3.0% in 2026.
- **Key Drivers of India's Growth**
 - The rapid growth is expected to be **aided by India's demographic dividend** for the next 20 to 25 years.
 - India possesses a **competitive manufacturing advantage** and benefits from a strong policy push.

- The 10th NITI Aayog Governing Council Meeting discussed broad themes, including manufacturing, services, rural non-farm, urban informal, green economy, and circular economy.

Economic Significance

- **Boost to Investor Confidence:**
 - Enhanced global trust in Indian markets will attract greater FDI and FII inflows.
 - Better credit ratings and borrowing terms from international financial institutions.
- **Rise of Domestic Giants:**
 - Indian companies may increasingly emerge as global players, with more resources to innovate and expand.
 - Expansion of the startup ecosystem, driven by capital, scale, and global aspirations.
- **Sectoral Diversification:**
 - Services, manufacturing (under Make in India), and agriculture are set to benefit from economic spillover effects.
 - Growth of sunrise sectors: digital economy, renewable energy, EVs, and biotechnology.

Geopolitical Implications and Strategic Positioning

- **Enhanced Global Influence:**
 - **International Bargaining Power:** Economic ascension provides increased leverage in international negotiations
 - **Multilateral Engagement:** Strategic participation in key forums such as the Quad alliance, BRICS nations, Shanghai Cooperation Organization (SCO), I2U2 partnership, etc.
 - **Strategic Autonomy:** Maintains tradition while building strategic alliances.
- **Regional Dynamics:** Rise occurs within a complex landscape characterised by:
 - Strategic competition with China
 - Growing cooperation with the United States and allies
 - Leadership of the Global South
- **Supply Chain Diversification:**
 - **Manufacturing Hub Status:** India is positioned as a critical alternative to China-centric supply chains.
 - **Government Support:** The Production Linked Incentive scheme enhances attractiveness.

Environmental Challenges and Sustainability

- **Environmental Impact of Growth:**
 - Carbon Emissions:
 - ◆ India is the third-largest emitter of CO₂ globally.
 - ◆ It is responsible for approximately 7% of global emissions.
 - ◆ **Per capita emissions:** 1.9 tons (vs. U.S. 14.7 tons)
 - **Air Quality Crisis:**
 - ◆ India is home to 13 of the world's 20 most polluted cities.
 - ◆ Air pollution reduces GDP growth by 0.56 percentage points annually.
- **Economic Cost of Environmental Degradation:**
 - **Annual Impact:** Environmental degradation costs approximately \$80 billion annually.
 - **GDP Percentage:** Equivalent to 5.7% of GDP.
 - **Nature Dependency:** 33% of GDP is generated in sectors highly dependent on natural resources.

Social Implications

- **Employment Generation:**
 - As GDP grows, so does demand for labour across formal and informal sectors.
 - Potential for greater employment in skilled and semi-skilled sectors, especially for youth.
- **Poverty Reduction and Inequality:**
 - Higher revenues allow the government to fund welfare and poverty-alleviation programs.
 - However, risk of widening wealth gaps if growth is not inclusive or regionally balanced.
- **Rise of the Middle Class:**
 - Increase in consumption, lifestyle changes, and aspirations of the urban and rural middle class.
 - Greater demand for health, education, and digital infrastructure.

Challenges and Responsibilities Ahead

- **Inequality & Urban-Rural Divide:** Growth must be inclusive to avoid social unrest and alienation.
- **Sustainable Urbanisation:** As economic hubs grow, infrastructure, housing, and mobility must be upgraded.
- **Institutional Reforms:** Governance, judicial, and administrative reforms are needed to match the pace of growth.
- **Global Expectations:** India will increasingly be looked upon to mediate in conflicts, contribute to global peace, and uphold a rules-based order.
- **Climate Resilience and Resource Management:** India must address climate vulnerabilities, manage water stress, and transition to low-carbon pathways.

- **Human Capital and Skilling:** A young workforce needs large-scale upskilling to match industry demands and ensure productivity gains.

Conclusion

India's achievement of becoming the world's fourth-largest economy represents both a remarkable accomplishment and the beginning of a more complex phase of development. The country stands at a critical juncture where it must balance rapid economic growth with environmental sustainability, social inclusion, and geopolitical responsibilities.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. Discuss the factors contributing to India's accelerated economic growth and potential future rise. [150 words] [10 marks]

INSURANCE SECTOR

Why in News: Operation Sindoor and the increasing use of drones in recent warfare have led insurance companies to explore the possibility of launching war insurance cover for corporates and people in border states to safeguard their investments in projects and lives there.

Key Details

- The industry is also willing to create an **insurance pool to cover defence assets provided the government gives a guarantee for the purpose**, said Chairman and Managing Director of **General Insurance Corporation of India (GIC Re), the largest reinsurer in the country.**
- Currently, **India's defence establishments are not insured.** GIC Re has proposed creating an insurance pool for defence assets, similar to the one for nuclear facilities, contingent on government guarantee.

The term **reinsurer** refers to a company that provides financial protection to insurance companies. Reinsurers handle risks that are too large for insurance companies to handle on their own and make it possible for insurers to obtain more business than they would otherwise be able to.

Current status of Insurance Sector of India

India is **currently the 10th largest insurance market globally** and ranks 2nd among emerging markets, with a market share of approximately 1.9%.

- **Insurance density** has grown significantly, increased from USD 11.1 in 2001 to USD 95 in 2023-24.
- **Insurance penetration** has also shown consistent improvement, increasing from 2.7% in 2000 to 4% in 2022. Insurance penetration saw a marginal decline, slipping from **4.0% in FY23 to 3.7% in FY24.**

- Between 2014 and 2023, the sector attracted around Rs. 54,000 crore (USD 6.5 billion) in Foreign Direct Investment (FDI).
- In Budget 2025, the government proposed increasing the **FDI limit in the insurance sector from the existing 74% to 100%**.

Insurance Penetration is measured as the percentage of insurance premium to GDP. **Insurance Density** is calculated as the ratio of premium to population (per capita premium).

Challenges faced by the Insurance Sector

- **Affordability Concerns:** High premiums and underpriced products limit access, particularly for low-income segments.
- **Limited Penetration:** India’s insurance penetration stands at 3.7%, significantly below the global average of 7%, highlighting a substantial coverage gap and scope for expansion.
- **Cybersecurity and other Challenges:** Climate change, geopolitical uncertainties, and cyber threats are reshaping risk management. Digital fraud and mis-selling have emerged as major consumer concerns.
- **Regulatory Fragmentation:** The insurance sector faces **inconsistent regulations** across life, non-life, and health segments, creating operational complexity.
- **Claims Settlement Challenges:** Issues like delays, rejections, and lack of transparency in claim processing leads to customer dissatisfaction.
- **Rising Operational Costs:** The increasing cost of medical care and claim payouts puts pressure on both affordability for customers and profitability for insurers.
- **Restricted Distribution:** Insurance services are largely urban-focused, with limited outreach in rural areas, and a heavy dependence on agents for distribution.

Way Forward

- **Expanding Insurance Coverage:** Promote tailored insurance products for underserved segments like rural communities, MSMEs, and gig workers, alongside enhanced financial literacy campaigns to drive awareness and adoption.
- **Leveraging Existing Government Schemes:** Strengthen insurance outreach by leveraging existing initiatives like Jan Dhan Yojana, Atal Pension Yojana, and Suraksha Bima Yojana to extend protection to economically vulnerable and underserved sections of society.
- **Simplifying Insurance Products:** Design straightforward, easy-to-comprehend insurance offerings that are affordable and inclusive, with a focus on reaching rural areas and under-served populations.
- **Regulatory Reforms:** Simplify and harmonize IRDAI regulations to ensure consistency across the insurance

sector, and strengthen consumer protection laws to enable faster and fairer claim settlements.

- **Digital Security and Oversight:** Implement robust cybersecurity standards for digital insurance platforms and enhance fraud prevention through AI-based monitoring systems.
- **Promoting Innovation and Insurtech:** Ease compliance norms to support tech-based insurance startups and encourage AI-driven, usage-based insurance models to cater to evolving customer needs.

Conclusion

The evolving landscape of warfare, exemplified by Operation Sindoor and the rise of drone threats, has prompted a timely **re-evaluation of India’s insurance framework**. While the sector has made significant strides in terms of market size, investment, and regulatory reforms, deep-rooted issues like low rural outreach, affordability, and fragmented regulation continue to hinder its full potential. To ensure broader risk protection and economic resilience, India must **prioritize inclusive insurance access, technological innovation, and stronger public-private collaboration**—particularly in high-risk and underserved areas.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the major challenges facing India’s insurance sector and suggest policy measures to enhance its penetration, efficiency, and inclusivity, especially in light of emerging risks such as cyber threats and geopolitical tensions. [250 Words] [15 Marks]

ASSET MONETISATION STRATEGY (ROAD SECTOR)

Why in News: The **National Highways Authority of India (NHAI)** has recently released its **first-ever Asset Monetisation Strategy Document**, marking a major step towards sustainable financing and growth in India’s road infrastructure sector.

What is Asset Monetisation?

Asset monetisation refers to the process of **unlocking the economic value of existing public infrastructure assets** by involving private players. It is also known as **capital recycling**.

In this model:

- The government **leases or transfers operational assets** (such as roads) to private parties.
- In return, the private players make **upfront or periodic payments**.
- These funds are then **used to build new infrastructure**, creating a **positive financial cycle**.

India's Road Network

- India has the **second-largest road network** in the world.
- The **National Highways (NH)** stretch over **1.46 lakh km** as of 2024.
- Under programmes like **Bharatmala Pariyojana** and **SARDP-NE**, road development has seen exponential growth:
 - NH length increased from **65,569 km in 2004** to **1,46,145 km in 2024**.
 - **High-speed corridors** grew from **93 km (2014)** to **2,138 km (2024)**.
 - Road construction pace increased from **12.1 km/day (2014–15)** to **33.8 km/day (2023–24)**.
 - Capital expenditure grew **5.7 times** over the past decade, reaching a **record ₹3.01 lakh crore**.

NHAI's Asset Monetisation Framework

To mobilise capital and reduce dependency on government budgets, NHAI has adopted **three major monetisation mechanisms**:

1. Toll-Operate-Transfer (ToT) Model

- In the **ToT model**, NHAI leases **completed and operational highways** to private players for a **fixed period** (usually **20 years**).
- The private player (called the **concessionaire**) pays an **upfront lump sum** and gains rights to:
 - **Collect tolls**
 - **Operate and maintain** the road during the concession period
- The contract is awarded to the **highest bidder**.
- So far, NHAI has raised **₹49,000 crore** through the ToT model (as of FY 2024–25).

Advantages:

- Generates **immediate capital**.
- Improves **O&M efficiency** through private sector expertise.
- No traffic or revenue risk to NHAI after the lease.

2. Infrastructure Investment Trusts (InvITs)

- An **InvIT** is a **pooled investment vehicle** that raises money by selling **units to investors**.
- These investors get returns from **cash flows generated by operational highway projects**.
- In the **NHAI InvIT model**:
 - Revenue-generating roads are placed into a **trust structure**.
 - The **trust sells units** to institutional and retail investors.
 - **NHAI acts as the project manager**, ensuring O&M quality.

- Till FY 2024–25, NHAI has raised around **₹43,000 crore** through InvITs.

Advantages:

- Attracts **long-term investors** like pension and sovereign wealth funds.
- Offers **stable, low-risk returns**.
- Provides **liquidity and diversification** to investors.

3. Securitisation of User Fee Receipts

- In this model, NHAI creates a **Special Purpose Vehicle (SPV)** to **securitise future toll revenues** from selected toll plazas.
- The SPV then raises funds from **banks or financial institutions** based on these projected toll collections.
- This model has been used for financing major projects like the **Delhi-Mumbai Expressway**.
- So far, **over ₹40,000 crore** has been raised through securitisation.

Advantages:

- Provides **long-term project-based financing**.
- Ideal for **large-value highway projects**.
- Reduces reliance on annual budgetary allocations.

Overall Achievements So Far

Under the **National Monetisation Pipeline**, these three mechanisms combined have helped NHAI raise **over ₹1.4 lakh crore** for over **6,100 km** of national highways.

Why is Asset Monetisation Important?

- **Value Realisation:**
 - Helps realise the economic potential of completed assets, generating capital without additional taxation or borrowing.
- **Efficient Use of Resources:**
 - Encourages **private sector participation** in operations, improving service quality and efficiency.
- **Funding New Infrastructure:**
 - Proceeds from monetisation are used to fund new **greenfield road projects**, ensuring continuous development.
- **Reduced Fiscal Burden:**
 - Lessens pressure on government budgets, enabling **faster project execution**.

Conclusion

The NHAI's asset monetisation strategy is a **bold and forward-thinking step** that brings in **private investment, improves operational efficiency, and ensures sustained highway development** in India. With rising traffic and expanding infrastructure needs, such innovative financing models will play a **critical role in India's journey toward world-class road infrastructure**.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Which of the following mechanisms is/are used by the National Highways Authority of India (NHAI) under its asset monetisation strategy?

1. Infrastructure Investment Trusts (InvITs)
2. Toll-Operate-Transfer (ToT)
3. Sovereign Gold Bonds
4. Securitisation of user fee receipts

Select the correct answer using the code below:

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

Answer: (b)

Descriptive Question

Q. Discuss the structure and comparative advantages of Toll-Operate-Transfer (ToT), Infrastructure Investment Trusts (InvITs), and Securitisation as used by NHAI to monetise road assets. [150 words] [10 marks]

MICROFINANCE SECTOR

Why in News: The Reserve Bank of India (RBI) Deputy Governor has said that the microfinance sector continues to grapple with high indebtedness, elevated interest rates and coercive recovery practices.

About India's Microfinance Sector

- **Historical Background**
 - Initiated with the Self-Employed Women's Association (SEWA) Bank in Gujarat (1974).
 - Major boost through SHG-Bank Linkage Programme (SHG-BLP) by NABARD in 1992—now the world's largest microfinance program.
- **Role and Significance**
 - Crucial for financial inclusion and socio-economic development.
 - Serves low-income households, rural entrepreneurs, and women-led enterprises.
 - Provides access to savings, fund transfers, microcredit, micro-insurance, and other essential banking services.
- **Current Status: Key Data Facts**
 - As of March 31, 2024, the microfinance sector's gross loan portfolio (GLP) stood at ₹4.33 lakh crore, serving 7.8 crore unique borrowers through 14.9 crore active loan accounts.
- NBFC-MFIs hold the largest market share at approximately 39.4%, followed by banks (33.2%) and Small Finance Banks (SFBs) (17.1%).
- The sector contributes around 2.03% to India's Gross Value Added (GVA) and supports about 1.3 crore jobs.
- Microfinance operations are spread across 28 states, 8 Union Territories, and 730 districts.

Challenges Faced by the Microfinance Sector

- **Structural and Financial Barriers**
 - **High Transaction Costs and Absence of Collateral:** Early credit schemes were plagued by elevated costs and inefficiencies, and many rural poor lacked collateral to secure loans.
 - **High Operational Costs:** Reaching remote areas incurs significant operational and administrative costs.
 - **Limited Access to Affordable Capital:** Smaller MFIs struggle to secure inexpensive funding, relying on external sources that lead to higher borrowing and lending costs.
- **Credit Risk and Borrower Vulnerability**
 - **Asset Quality Deterioration and Loan Defaults:** Gross Non-Performing Assets (NPAs) surged to around 16% by the end of FY25, nearly doubling from 8.8% in FY24.
 - **Over-indebtedness:** Borrowers often source credit from multiple lenders, leading to excessive debt burdens and higher default rates.
- **Regulatory and Policy Constraints**
 - **Regulatory Challenges and Policy Uncertainty:** Frequent changes, unclear guidelines, and inconsistent oversight create operational inefficiencies. Recent stricter regulations, like the 3-lender cap and ₹2 lakh loan limit per borrower, have led to increased borrower rejection rates and a slowdown in disbursements.
- **Literacy and Inclusion Gaps**
 - **Low Financial and Digital Literacy:** Many clients lack financial literacy, hindering their ability to understand loan terms, manage debt, and fully utilise microfinance services.
 - **Regional Imbalances:** A significant portion of the microfinance portfolio is concentrated in a few states, leaving many regions underserved.
- **External Shocks and Crisis Events**
 - **Andhra Pradesh Crisis (2010):** Allegations of coercive loan recovery methods and high interest rates led to stringent state regulations and a steep fall in microfinance activities.
 - **Demonetisation (2016):** The unanticipated demonetisation of high-value currency notes severely impacted the sector, causing difficulties in

loan servicing and heightened defaults among cash-transacting debtors.

- **COVID-19 Pandemic (2020):** Lockdowns and economic disruptions impaired repayment capabilities, leading to liquidity problems for MFIs.

Way Forward and Recommendations

- **Strengthening Responsible Lending Practices**
 - **Balance Outreach and Responsible Lending:** It is crucial to prevent over-indebtedness among borrowers.
 - **Robust Credit Assessment and Financial Literacy:** Implement strong credit assessment processes, including mandatory income and expenditure assessment, Fixed Obligation to Income Ratio (FOIR) calculation, and financial literacy initiatives to ensure borrowers comprehend loan terms and manage debt effectively.
 - **Transparent Pricing:** Lenders must ensure clear and transparent disclosure of interest rates and charges.
 - **Enhanced Client Protection:** Strengthen grievance redressal mechanisms and ensure fair practices to build borrower trust.
- **Leveraging Technology and Digitalisation**
 - **Digital Transformation:** Continue to leverage digital lending platforms, mobile applications, AI-driven credit scoring, and UPI integration to enhance outreach, improve operational efficiency, reduce costs, and streamline loan processing and repayments.
 - **Addressing Digital Divide:** While promoting digitalisation, ensure that digitally excluded customers still have access to appropriate financial services.
 - **Data Security and Fraud Prevention:** Invest in advanced cybersecurity measures and AI-driven threat detection systems to safeguard customer data and prevent fraudulent activities.
- **Ensuring Funding and Capital Availability**
 - **Dedicated Funding Mechanisms:** Explore dedicated funding mechanisms or guarantee funds to help smaller MFIs access capital in a hassle-free manner.
 - **Growth Capital:** Facilitate arrangements for growth capital beyond existing mechanisms like the India Microfinance Equity Fund.

Initiatives for the Microfinance Sector

- **NABARD Initiatives**
 - **Self-Help Group – Bank Linkage Programme (SHG-BLP):** NABARD provides grant support to various partner agencies for promotion, nurturing, and credit linkage of SHGs across the country.
 - **Promotion of Women SHGs in Backward and LWE Districts:** A scheme implemented in 150 identified Left Wing Extremism (LWE) and Backward districts to promote

and finance women SHGs, supporting activities like capacity building and marketing.

- **Promotion of Joint Liability Groups (JLGs):** NABARD provides grant support to banks and other eligible agencies for the formation and nurturing of JLGs and capacity building of stakeholders.
- **Livelihood and Enterprise Development Programmes (LEDPs):** NABARD implements schemes like the Micro Enterprise Development Programme (MEDP) to impart and upgrade skills for SHG members to set up micro-enterprises. The NABEnterprise portal was launched to digitise MEDP proposals.
- **Government of India (GoI) Initiatives**
 - **National Rural Livelihood Mission (NRLM):** Renamed as Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM), it focuses on poverty reduction. It provides interest subvention to women SHGs, reducing the effective cost of bank credit.
 - **Lakshpati Didi Scheme:** Launched on August 15, 2023, this scheme aims to empower 3 crores mature SHG women to become individual micro-entrepreneurs earning an annual household income of ₹1 lakh or more.
 - **Pradhan Mantri Jan Dhan Yojana (PMJDY):** This initiative has significantly propelled the growth of the microfinance sector by expanding access to formal financial services.
 - **MUDRA (Micro Units Development & Refinance Agency Ltd.):** A subsidiary of SIDBI, MUDRA provides refinance assistance to MFIs, banks, and NBFCs for lending to micro and small businesses.
 - **Credit Guarantee Fund Trust for Micro and Small Enterprises (CGTMSE):** This scheme supports the sector by providing loan guarantees, with the credit guarantee limit for micro and small enterprises doubled from ₹5 crore to ₹10 crore per loan in the Union Budget 2025-26.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. What challenges and regulatory changes have shaped India's microfinance sector? How has the Indian microfinance sector achieved profitability and significant growth recently? [250 words] [15 marks]

FOREIGN INVESTMENTS IN INDIA

Why in News: The Reserve Bank of India (RBI) Governor stated that the recent moderation in net Foreign Direct Investment (FDI) is not a cause for concern, as the rise in repatriation of funds reflects a mature and well-functioning investment environment in India.

Overview of Foreign Direct Investment (FDI)

- While gross FDI inflows remained robust, **net FDI witnessed a sharp moderation.**
- **Gross FDI Inflows:** These rose by 14% to USD 81 billion

in FY 2024–25, up from USD 71.3 billion in the previous year. This indicates that India continues to attract significant investment.

- **Net FDI:** This sharply moderated to USD 0.4 billion in FY 2024–25, a significant decrease from USD 10.1 billion a year earlier.
- **Reasons for Moderation:** The decline in net FDI is attributed to higher repatriation of funds and a rise in net outward FDI.

Overview of Foreign Portfolio Investment (FPI) or (FII)

- Foreign portfolio investment also experienced a notable decline.
- FPI inflows **dropped steeply to USD 1.7 billion in FY 2024–25.**
- This decline occurred as foreign investors opted to book profits from their Indian equity holdings.

External Sector Resilience and Outlook

- **Current Account Deficit (CAD)**
 - India’s current account deficit for FY 2024–25 is expected to remain low. This is supported by a narrower trade deficit in Q4, strong services exports, and robust remittance inflows.
 - Looking ahead, net services and remittance receipts are anticipated to remain in surplus, effectively counterbalancing any pressure from a wider goods trade deficit.
 - The CAD for FY 2025–26 is projected to remain well within sustainable levels.
- **Merchandise Trade**
 - Despite rising global uncertainties and trade tensions, India’s merchandise trade demonstrated resilience in April 2025.

- However, the trade deficit widened during that month as imports grew faster than exports.
- **Foreign Exchange Reserves**
 - As of May 30, 2025, India’s **foreign exchange reserves stood at USD 691.5 billion**, a slight decrease from USD 692.72 billion the preceding week.
 - These reserves are deemed sufficient, **capable of covering more than 11 months of goods imports** and approximately 96% of outstanding external debt.

Factors Contributing to High Foreign Direct Investment (FDI)

- **Competitiveness and Innovation:** India’s rank in the World Competitive Index 2024 improved to 40th from 43rd in 2021. It also secured the 40th position in the Global Innovation Index 2023, up from 81st in 2015, reflecting progress in innovation and competitiveness.
- **Global Investment Standing:** India was the third-largest recipient of greenfield projects with 1,008 announcements, according to the World Investment Report 2023 by the United Nations Conference on Trade and Development (UNCTAD). It also recorded a 64% increase in international project finance deals, ranking second globally.
- **Improved Business Environment:** India improved its Doing Business ranking from 142nd in 2014 to 63rd in the World Bank’s Doing Business Report (DBR) 2020, showing efforts to ease regulations and boost investor confidence.
- **Policy Reforms:** The government allows 100% Foreign Direct Investment (FDI) under the automatic route in most sectors. In 2024, the Income Tax Act, 1961, was amended to abolish angel tax and reduce the income tax rate on the income of a foreign company.

Differences Between Foreign Direct Investment (FDI) and Foreign Institutional Investment (FII)

S. No.	Foreign Direct Investment (FDI)	Foreign Institutional Investment (FII)
1.	Investments made by companies in foreign entities.	Institutional investors investing in a country’s financial market.
2.	Injects long-term capital into the company receiving the investment.	Can bring both short-term and long-term capital to the host country.
3.	Contributes to job creation, economic growth, and infrastructural development.	Does not contribute significantly to infrastructure or job creation.
4.	Targets specific companies.	Does not have such targeted investments.
5.	Involves complex entry and exit processes.	Allows for easy entry and exit into the stock market.
6.	Entails transfer of funds, resources, technology, strategies, and know-how.	Primarily involves the transfer of funds.
7.	Enhances a country’s productivity.	Primarily increases capital availability.
8.	Allows for management control in the invested company.	Does not allow for management control.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements:

Statement-I: Foreign Direct Investment (FDI) is generally considered more stable and long-term, contributing directly to capital formation, technology transfer, and job creation in the host economy.

Statement-II: Foreign Institutional Investment (FII) is often more volatile and liquid, primarily impacting the financial markets of the host country.

Which one of the following is correct in respect of the above statements?

- (a) Both Statement-I and Statement-II are correct and Statement-II is the correct explanation for Statement-I
- (b) Both Statement-I and Statement-II are correct and Statement-II is not the correct explanation for Statement-I
- (c) Statement-I is correct but Statement-II is incorrect
- (d) Statement-I is incorrect but Statement-II is correct

Answer: (b)

- The **number of operational airports** in India has increased from 74 in 2014 to 157 in 2024.
- **Low-cost carriers (LCCs)** have played a significant role in this growth, accounting for 78.4% of Indian domestic capacity in April 2024, the sharpest transition to LCCs among the top five markets.
- The industry significantly contributes to India's economy, generating an **estimated USD 53.6 billion** contribution to GDP and supporting 7.7 million jobs in 2023.

Concerns of Safety and Security

Despite robust growth, India's rapidly expanding aviation sector faces challenges, including those related to safety and security. The **tragic hull loss of Air India Flight 171 on June 12, 2025**, a Boeing 787-8, minutes after liftoff, highlights the need for global scrutiny and investigation.

This incident, involving an **11-plus-year-old aircraft with ample avionics redundancy** and reliable twin engines, has led to speculation about causes such as **load planning issues, ambient air temperature, engine performance, wing surface settings, or a bird hit**.

As safety concerns dominate headlines, they also **raise questions about the broader economic and regulatory environment** in which Indian airlines operate.

- **Airline profitability is not guaranteed**, and the wider regulatory environment must support sustainable air transport growth.
 - **Rising costs and tax uncertainty** are critical challenges, particularly regarding taxation, where there is a higher degree of uncertainty for tax planning. Aviation fuel constitutes approximately 40-50% of an airline's operational expenses in India, well above the global average, due to increased tax burden.
 - **Labour and skills challenges**, specifically a pressing need for approximately 37,000 pilots and 38,000 maintenance technicians over the next two decades.
 - There is an **existing shortage of trained pilots**, exacerbated by high training costs, which affects airlines' ability to expand and meet demand.
 - **Global supply chain disruptions** relating to engines and Maintenance, Repair, and Overhaul (MRO) have resulted in over 150 aircraft in the Indian fleet remaining grounded at the end of 2024.
 - **Bureaucratic inefficiencies**, inconsistent policy implementation, unnecessary overlap and duplication, and delays in regulatory approvals can impede airline operations, increase costs, and stifle growth.
- ### Efforts Made in This Regard
- **Air India's Transformation:** Air India's new owner, Tata Sons, is executing **'Vihaan.AI'**, a five-year transformational roadmap that includes the appointment of a 'head of group safety, security and quality'.
 - **Regulatory Oversight:** India's civil aviation regulatory

INDIAN AVIATION SECTOR

Why in News: Recently, an Air India Boeing 787 Dreamliner operating a flight from Ahmedabad to London Gatwick crashed shortly after takeoff.

Related News

India has become the world's third-largest domestic aviation market after the U.S. and China. According to data compiled by aviation analytics firm Official Airline Guide (OAG), India is now third in the aviation market.

Overview of India's Aviation Sector

- India has emerged as the **world's third-largest domestic aviation market**, following the U.S. and China.
- When considering both domestic and international passenger traffic, India also ranks as the third-largest aviation market globally according to the **International Air Transport Association (IATA)**.
- This rapid expansion is fueled by **soaring demand and supportive government policies**. Over the last decade, India's domestic airline capacity has doubled from 7.9 million seats in April 2014 to 15.5 million in April 2024, replacing Brazil in the third position.
- India has also recorded the highest **annual average capacity growth** rate of 6.9% among the top five countries over the last decade.

body, the Directorate General of Civil Aviation (DGCA), is scrutinising the airline sector.

- **Legislative Reforms:** The **Protection of Interest in Aircraft Objects Bill, 2025**, passed in April 2025, aligns India's aircraft leasing and financing framework with international standards, aiming to reduce leasing costs for Indian carriers. The **Bharatiya Vayuyan Adhiniyam 2024**, which came into force on January 1, 2025, modernised India's aviation sector by replacing the colonial-era Aircraft Act of 1934. It aims to foster indigenous manufacturing, align regulations with international conventions, and streamline regulatory processes.
- **Infrastructure Development:** The number of operational airports has significantly increased from 74 in 2014 to 157 in 2024, with an ambition to reach 350-400 by 2047. **12 new Greenfield Airports** have been operationalised since 2014, with rapid progress on others like Noida (Jewar) and Navi Mumbai.
- **Regional Connectivity Scheme (RCS) – UDAN:** Launched in 2016, UDAN aims to provide connectivity to **unserved and underserved airports** by reviving existing airstrips, making air travel affordable for the common people. As of August 31, 2024, 583 RCS routes have commenced operations connecting 86 airports, including heliports and water aerodromes, benefiting over 1.43 crore passengers. **UDAN Yatri Cafés** have been launched at Kolkata and Chennai Airports to provide affordable and quality food options for passengers.
- **Safety and Technology Enhancements:** An advanced **Digital Flight Data Recorder and Cockpit Voice Recorder (DFDR & CVR) Laboratory** was inaugurated at the Aircraft Accident Investigation Bureau (AAIB) in New Delhi to improve incident investigation. **Digi Yatra** services have been expanded to 24 airports, providing a seamless, contactless travel experience. Over 80 lakh users have downloaded the app, completing more than 4 crore journeys.
- **Sustainability Initiatives:** The Ministry of Civil Aviation actively promotes sustainable aviation, with around 80 airports now operating on 100% green energy. Delhi and Mumbai airports have achieved Level 4+ Carbon Accreditation, becoming carbon neutral, while Bengaluru Airport achieved Level 5.
- **MRO Hub Development:** A uniform 5% Integrated Goods and Services Tax (IGST) rate has been introduced for aircraft parts to promote India as a competitive global MRO hub.

Recommendations and Way Forward

- **Infrastructure Investment:** Continue expanding and modernising airports to accommodate the expected threefold increase in traffic over the next 20 years. This includes investing in capacity and connectivity challenges proactively.
- **Taxation Reform:** Address the high-cost environment

for aviation, particularly concerning taxation, to enhance airline profitability and network operations. Further reductions or standardisation of taxes on aviation fuel and operations are crucial.

- **Skills and Labour Development:** Make substantial investments in training, skills development, and human resource development to meet the pressing demand for pilots and maintenance technicians. This includes expanding Flight Training Organisations and ensuring the affordability of training.
- **Sustainable Aviation:** Drive green energy adoption at airports and facilitate the development of a Sustainable Aviation Fuel (SAF) production ecosystem through public investment, fiscal incentives, and supportive market conditions.
- **Regulatory Environment:** Streamline international regulatory structures, enhance collaboration among stakeholders, and respect international treaties. Ongoing vigilance is required to minimise bureaucratic inefficiencies, inconsistent policy implementation, and delays in regulatory approvals that impede operations and increase costs.
- **Economic Stability:** Manage household debt to maintain economic stability, as rising household debt and declining savings pose a risk to long-term growth.
- **Targeted Improvements:** Address specific areas, including safety and security, labour market efficiency, health infrastructure, and ICT readiness, as well as environmental and socio-economic impacts.
- **Industry Collaboration:** Foster effective and ongoing dialogue and collaboration across the entire aviation value chain, involving airlines, airports, governments, and regulatory authorities.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. What broader safety challenges face India's rapidly expanding aviation market? Suggest measures for further expansion of the aviation sector in India. [250 words] [15 marks]

REVISING THE BASE YEAR OF KEY ECONOMIC INDICATORS

Why in News: The Ministry of Statistics and Programme Implementation (MoSPI) has announced that new base years for GDP, Consumer Price Index (CPI), and Index of Industrial Production (IIP) will be introduced starting early 2026.

What is a Base Year?

- A base year is the initial year in a **series of years within an economic or financial index**, typically set to an arbitrary level of 100.

- **Significance:** It serves as a starting point for calculations and for comparison in measuring business activity or an economic/financial index.
- **For example,** to determine the rate of inflation between 2016 and 2024, 2016 would be considered the base year. Analysts usually select recent years as base years.

Need for the Change of Base Year

- **Accurate Economic Understanding and Reporting:** Revisions help to more precisely understand and report the current state of the economy, which is essential for policymakers and all economic agents, from large businesses to entrepreneurs.
- **Reflecting Economic Changes:** Economies undergo fundamental changes over time. Revisions capture these shifts, allowing for new industries to be included and outdated ones removed from calculations. For instance, India's economy has transformed from predominantly agrarian to one where the services sector contributes around 55% of the GDP, requiring different datasets and methodologies for estimation.
- **Providing Accurate "Real" Economic Growth:** Base year revisions offer a more accurate picture of "real" economic growth, which is the growth after accounting for inflation.
- **Statistical Recommendations:** Historically, base years were aligned with decennial Population Censuses (years ending with 1) for workforce estimates in the unorganised sector.
 - Since 1999, the Central Statistics Office (CSO) has been using workforce estimates from the National Sample Survey Organisation's (NSSO) Employment and Unemployment Surveys, conducted every five years.
 - This shift led to base years being changed every five years, in line with the National Statistical Commission's recommendation that all economic indices should be "rebased" at least once every five years.
- **Addressing Data Gaps and Credibility:** The revision is particularly crucial for India's global standing, as the previous revision in 2015 sparked controversy, with experts questioning the overestimation of India's GDP.
 - The delay in changing the base year since 2011-12 (due to issues with the 2017-18 Consumer Expenditure Survey and Periodic Labour Force Survey results, and the impact of demonetisation and GST, followed by the COVID-19 pandemic) has also meant that some inaccuracies might have crept into GDP estimation.
 - The upcoming revisions aim to improve the credibility of India's macroeconomic data, especially as India approaches becoming the third-largest economy globally.

Key Economic Indicators

- **Gross Domestic Product (GDP)**
 - GDP measures the current market value of all final goods and services produced within a country in a specific period (e.g. a quarter or a year).

- The term "final" is crucial, meaning only goods and services bought by final consumers or users are included, excluding intermediate and primary products.
- **Current Base Year:** The current base year for GDP calculations is 2011-12.
- **New Base Year and Release Schedule:** The new series for GDP is scheduled to be released on February 27, 2026, with Financial Year 2022-23 as the base year.
- This upcoming revision will be the eighth for India's national income (GDP) estimates.

• Consumer Price Index (CPI)

- The Consumer Price Index (CPI), **published by the Ministry of Statistics and Programme Implementation (MoSPI)**, tracks the average change in prices of a fixed basket of goods and services commonly consumed by households.
- **Current Base Year:** The existing base year for CPI is 2012.
- **New Base Year and Release Schedule:** The year 2024 has been identified as the revised base year for CPI. The new CPI series is expected to be published from the first quarter of 2026.
- **Composition and Weightage Changes:** The item basket and the weightage of items for the new CPI series will be decided based on the NSO's Household Consumer Expenditure Survey (HCES) conducted in 2023-24. Initially, 2022-23 HCES data was considered, but the Ministry decided to use the latest 2023-24 data as it became available.

• Index of Industrial Production (IIP)

- The Index of Industrial Production (IIP), **released by the Central Statistics Office under MoSPI**, tracks short-term changes in industrial output. It serves as an important indicator of the growth or decline in industrial activity over a specific period.
- The IIP is compiled as a simple weighted arithmetic mean of production relatives by using Laspeyre's formula. The IIP is a quantum index, the production of items being expressed in physical terms.
- **Current Base Year:** The current base year for IIP is 2011-12.
- **New Base Year:** For IIP, 2022 -23 has been tentatively identified as the revised base. IIP on revised base would be released from 2026-27.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

- Q. Consider the following statements regarding the concept of a base year:
1. A base year is assigned a standard index value, usually 100, to allow comparison of economic indicators over time.
 2. The base year must always be the year with the highest GDP growth rate in a decade.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

(a) Answer: (a)

RBI MONETARY POLICY UPDATE

Why in News: Reserve Bank of India decided to cut Cash Reserve Ratio (CRR) by a huge 1%, which will unlock ₹2.5 lakh crore liquidity to the banking system for lending to productive sectors of the economy.

Key Details

- The Reserve Bank of India remains committed to providing sufficient liquidity to the banking system.
- It has been decided to reduce the **Cash Reserve Ratio (CRR) by 100 basis points (bps) to 3 per cent of Net Demand and Time Liabilities (NDTL)** in a staggered manner during the course of the year.
- This reduction will be carried out in four equal tranches of 25 bps each, with effect from the fortnights beginning September 6, October 4, November 1, and November 29, 2025.
- Higher credit flow will help in boosting economic growth, which hit a four-year low of 6.5% in FY 2024–25.
- The RBI, however, did not tinker with the Statutory Liquidity Ratio (SLR) and maintained it at 18 per cent.

Related News

RBI has announced its latest Monetary Policy following the 55th meeting of its Monetary Policy Committee held over three days.

- Policy repo rate is being reduced by 50 basis points (bps) to 5.50 per cent.
- There will be consequent adjustment of the Standing Deposit Facility (SDF) rate under the Liquidity Adjustment Facility (LAF) to 5.25 per cent and of the Marginal Standing Facility (MSF) rate and the Bank Rate to 5.75 per cent.

Key Concepts

- **Cash Reserve Ratio:** Cash Reserve Ratio (CRR) is the share of a bank's total deposit that is mandated by the Reserve Bank of India (RBI) to be maintained with the latter as reserves in the form of liquid cash. The Cash Reserve Ratio ensures that part of the bank's deposits is with the Central Bank and are hence secure. Another objective of CRR is to keep inflation under control. The higher the CRR, the lower the liquidity with the banks and vice versa. Banks don't earn returns on money parked as CRR.
- **Statutory Liquidity Ratio (SLR):** Statutory Liquidity Ratio (SLR) refers to the minimum portion of a bank's

deposits that must be held in the form of liquid assets such as cash, gold, or approved securities. It is set by the Reserve Bank of India (RBI), this requirement ensures that banks maintain a certain level of reserves before extending credit, thereby helping regulate credit expansion in the economy. Banks earn returns on money parked as SLR.

- **Net Demand and Time Liabilities:** NDTL refers to the total demand and time liabilities (deposits) held by banks. It includes deposits from the general public and balances held by the bank with other banks.
- **Repo Rate:** The Repo Rate is the interest rate at which the Reserve Bank of India (RBI) loans money to commercial banks. More specifically, it is the interest rate at which the Reserve Bank provides liquidity under the liquidity adjustment facility (LAF) to all LAF participants against the collateral of government and other approved securities.
- **Standing Deposit Facility (SDF) Rate:** The rate at which the Reserve Bank accepts uncollateralised deposits, on an overnight basis, from all LAF participants. The SDF is also a financial stability tool in addition to its role in liquidity management. The SDF rate is placed at 25 basis points below the policy repo rate. With introduction of SDF in April 2022, the SDF rate replaced the fixed reverse repo rate as the floor of the LAF corridor.
- **Marginal Standing Facility (MSF) Rate:** The penal rate at which banks can borrow, on an overnight basis, from the Reserve Bank by dipping into their Statutory Liquidity Ratio (SLR) portfolio up to a predefined limit (2 per cent). This provides a safety valve against unanticipated liquidity shocks to the banking system. The MSF rate is placed at 25 basis points above the policy repo rate.
- **Liquidity Adjustment Facility (LAF):** The LAF refers to the Reserve Bank's operations through which it injects/absorbs liquidity into/from the banking system. It consists of overnight as well as term repo/reverse repos (fixed as well as variable rates), SDF and MSF. Apart from LAF, instruments of liquidity management include outright open market operations (OMOs), forex swaps and market stabilisation scheme (MSS).

Monetary Policy Committee

- The Monetary Policy Committee (MPC) was established following a **Memorandum of Understanding between the Government of India and the Reserve Bank of India** to implement the new inflation-targeting monetary policy framework.
- The **Finance Act of 2016** amended the Reserve Bank of India Act, 1934, to create a legal and institutional foundation for the MPC.
- As per Section 45ZB of the amended Act, the central government has the authority to form a six-member MPC.
- Its primary role is to set the **benchmark policy rate (repo rate) to keep inflation within the designated target range**. The

MPC replaced the earlier system managed by the Technical Advisory Committee.

- A meeting of the Monetary Policy Committee (MPC) **requires a minimum of four members to be present for it to proceed.** Among them, the presence of the RBI Governor is mandatory; if the Governor is unavailable, the Deputy Governor, who is also a member of the MPC, must be present in their place.
- The Monetary Policy Committee (MPC) **makes decisions through a majority vote.** If there is a tie, the RBI Governor holds a second or casting vote to break the deadlock. The decisions made by the MPC are binding on the Reserve Bank of India.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q1. Consider the following statements regarding monetary policy instruments in India:

1. Banks earn interest on the reserves maintained as Cash Reserve Ratio (CRR) with the Reserve Bank of India.
2. Statutory Liquidity Ratio (SLR) helps control credit growth by requiring banks to hold a portion of their deposits in liquid assets.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

Answer: (b)

GIG ECONOMY

Why in News: According to a new study by a government-run think tank, the gig and platform workforce in the nation is predicted to increase to almost 62 million by 2047, **making up nearly 15% of the entire non-agricultural workforce.**

Key Details

- This growth is driven by **technological advancements, changing labour market preferences, and the growing need for flexible work arrangements.**
- In order to give more weight to recent observations, the **VV Giri National Labour Institute (VVGNI)**, which is affiliated with the labour ministry, used estimates from a 2022 NITI Aayog report on gig workers and forecasted using the exponential smoothing Error, Trend, Seasonality model.
- According to the estimate, the **number of gig workers will more than double over the next 17 years**, following a pattern of compound growth, suggesting that the sector will be a significant contributor to the creation of jobs in the Indian economy.

- It began in industries like food delivery and ride-sharing, but it has since spread to other **fields like professional consulting, healthcare, education, and creative services.**
- In 2020, approximately 11 platform companies in India employed over 3 million people, according to the Aayog report. **By 2030, it is anticipated that this number will have increased to 23 million, or 7% of the entire non-agricultural workforce.**

Character of Gig Economy

- The gig economy is a labour market characterized by **temporary, contract, and freelance jobs rather than permanent positions.** People earn money from providing on-demand work, services, or goods.
- A wide variety of positions fall into the category of a gig. The work can range from managing short-term rentals, tutoring, writing code, driving for ride-share services (OLA and Uber), delivering food (Swiggy AND Zomato), or authoring freelance articles.

Opportunities for Stakeholders

For Employers

- Wider range of applicants due to remote work options.
- Can hire and fire more easily based on seasonal work.
- Do not need to provide costly benefits like health insurance or paid vacation time.

For Employees

- Greater flexibility for individuals to set their own schedule.
- Offers various side-hustle opportunities to those who work regular full-time jobs.
- Remote positions allow gig workers to live anywhere that has an internet connection.

Challenges of the Gig Economy in India

- **Low Sustainability:** The gig economy trend can make it harder for full-time employees to develop careers and establish a long-term reputation.
- **Increases worker exploitation:** The gig economy is often associated with eroding worker rights, loss of health insurance, and sick and vacation pay.
- **Low wage hike Pressure:** Employers are under little pressure to pay higher wages. Opening up positions to people living anywhere in the world, including places where the cost of living is much cheaper, allows employers to seek places with lower wages.
- **Impact on other aspects of life and work:** The flexibility of working gigs can disrupt the work-life balance, sleep patterns, and daily life. Long-term relationships between workers, employers, clients, and vendors can erode.

Way Forward: Key recommendations provided by the study

- **Unionization:** The workers must be free to form or join collectives or unions so they can **bargain collectively for better pay, insurance, working conditions, and more transparency within the platform economy.**

- **Classification:** The report urges for clarity in the classification of gig workers, pointing out that they are **legally recognised in a number of nations, including the UK, Canada, Spain, the Netherlands, France, and Denmark.**
- **Definition:** It emphasises the necessity of defining **precise standards to distinguish between independent contractors and employees, taking into consideration elements like job security, financial reliance, and control over work.**
- In addition, the study recommends **algorithmic accountability and equitable task distribution, a minimum wage and fair working hours, expedited grievance and dispute resolution, worker empowerment via upskilling and training, and mandatory occupational health and safety regulations.**

Conclusion

The gig economy market is expected to grow at a compounded annual growth rate (CAGR) of 17 percent. Its contribution to India’s gross domestic product (GDP) is estimated to be substantial, with the **potential to add 1.25 percent to GDP by 2030.**

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the opportunities and challenges associated with the rise of the gig economy in India. Suggest policy measures to ensure inclusive and sustainable growth in this sector. [250 Words] [15 Marks]

NEW SPECIAL ECONOMIC ZONE (SEZ) RULES

Why in News: Recently, the **government has notified several changes to the regulations for the setting up of special economic zones (SEZs)** for the manufacturing of semiconductors and electronic components.

Key Details

- **Reducing minimum plot size:** The **amendment to Rule 5 of the SEZ Rules, 2006**, has meant that an SEZ set up exclusively for the manufacturing of semiconductors or electronic components will now **need a minimum contiguous land area of 10 hectares, down from the earlier requirement of 50 hectares.**
- **Domestic sales:** In addition to allowing SEZ units in the semiconductor and electronics component manufacturing sectors to export only semiconductors and electronic components, the **amendment to Rule 18 of the SEZ**

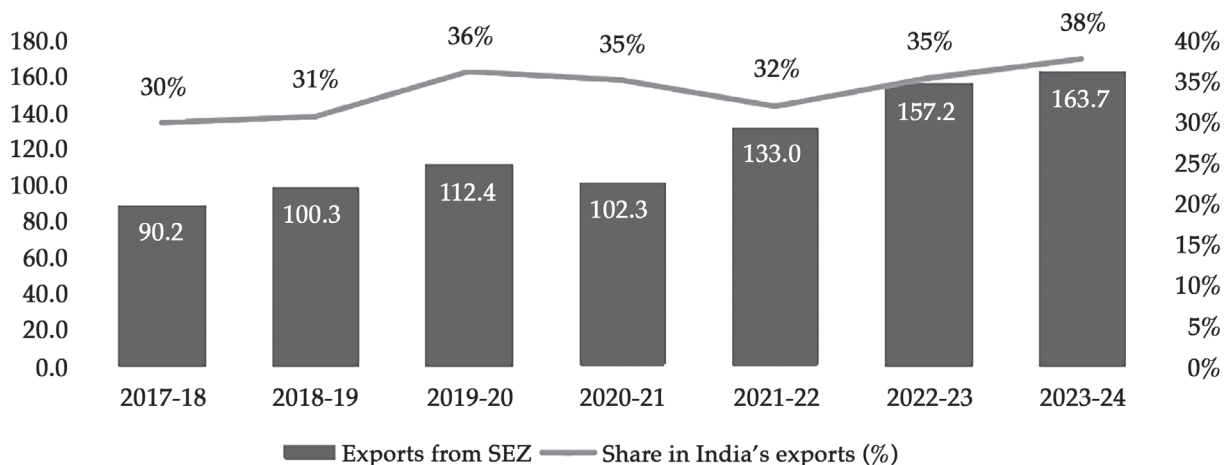
Rules also permits these units to supply domestically to the rest of India after paying the applicable duties.

- **Land acquisition:** The **amendment to Rule 7 of the SEZ Rules, 2006** empowers Board of Approval for SEZs to relax the requirement that SEZ land be encumbrance-free in cases where it is mortgaged or leased to the Central or State Government or their authorised agencies, making land acquisition easier.
- With a **combined investment of ₹13,100 crore**, approval has been given for the establishment of two semiconductor and electronic components SEZ facilities in Gujarat and Karnataka subsequent to the announcement of these changes.

About Special Economic Zones (SEZs)

- Special economic zones (SEZs) are designated regions inside a nation that provide **easier trade regulations and incentives to businesses operating there.**
- The SEZ’s primary goals are to **increase economic activity, encourage domestic and foreign investment, boost exports of goods and services, and create more job opportunities** in addition to building additional infrastructure.
- **In 1965, India established its first EPZ in Kandla, Gujarat**, and it was one of the first in Asia.
- The goal of the **SEZ policy**, which was unveiled in **April 2000**, is to use SEZs as a catalyst for economic growth at the federal and state levels of the nation, backed by first-rate infrastructure and an alluring package of incentives.
- This **program transformed the eight existing EPZs**—which were situated in Kandla and Surat, Gujarat; Mumbai, Maharashtra; Cochin, Kerala; Chennai, Tamil Nadu; Visakhapatnam, Andhra Pradesh; Falta, West Bengal; and Noida, Uttar Pradesh—into Special Economic Zones (SEZs).
- Later, in May 2005, the Indian Parliament passed the **SEZ Act, 2005**, which, with the help of the SEZ Rules, went into force on February 10, 2006.
- India has **280 SEZs in operation as of March 31, 2024.**
- In recent years, SEZs in India have also been crucial in **raising the nation’s level of global competitiveness.**
- In addition to **advancing the nation’s exports**, these designated economic areas drew foreign direct investment.
- By providing tax breaks and modernising regulatory processes, the **program also helped to upgrade infrastructure and promoted the expansion of new enterprises** across a range of industries in the designated zones, increasing the competitiveness of Indian goods and services on the international market.

Exports from SEZs in India (US\$ billion)



Conclusion

The revised SEZ rules **simplify land norms, allow domestic sales, and ease acquisition processes**, making it easier to set up semiconductor and electronics units. This supports India's goal of becoming a global manufacturing hub and strengthening its electronics value chain.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the recent changes introduced in the Special Economic Zone (SEZ) Rules with reference to semiconductor and electronics manufacturing. How do these reforms align with India's vision of becoming a global manufacturing hub? [250 Words] [15 Marks]

NATIONAL CONFERENCE ON AGRI STACK

Why in News: The National Conference on Agri Stack: *Turning Data into Delivery* drew attention as the Secretary of the Department of Agriculture & Farmers' Welfare, reaffirmed the government's dedication to **leveraging technology for transparent, farmer-centric governance**, showcasing the push to implement digital agriculture platforms for better service delivery and accountability.

Key Details

- The conference served as a strategic platform for senior officials from the Centre and States' key stakeholders to deliberate on the progress, challenges, and future roadmap for the implementation of Agri Stack under the Digital Agriculture Mission (DAM).
- Agri Stack Overview and Key Integrations**
 - **Farmer ID Integration:** Agri Stack involves the integration of the Farmer ID with flagship schemes

such as PM-KISAN, PMFBY (Pradhan Mantri Fasal Bima Yojana), and KCC (Kisan Credit Card).

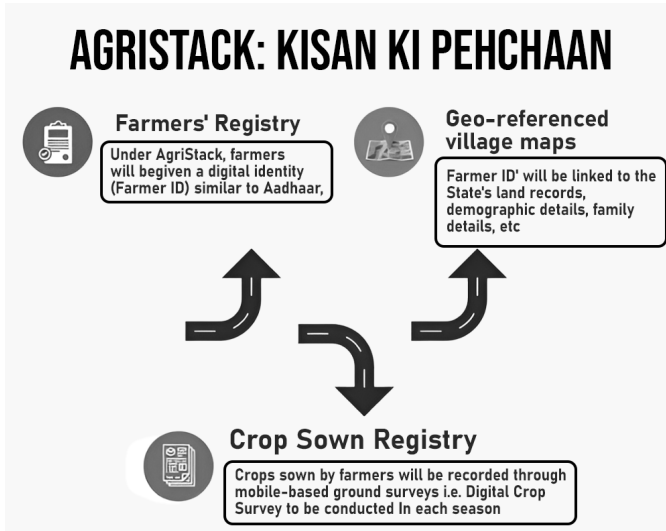
- **Data Standards and Quality:** The importance of georeferencing, robust data quality assurance, and compliance with Unified Farmer Service Interface (UFSI) standards was stressed.
- **New Services for Farmers:** The conference introduced upcoming services like farmer authorisation systems and Digitally Verifiable Certificates (DVCs). These services are designed to empower farmers to securely and selectively share their land and crop information.

Digital Agriculture Mission

- The Digital Agriculture Mission is designed as an **umbrella scheme** to support various digital agriculture initiatives.
- These include creating **Digital Public Infrastructure (DPI)**, implementing the **Digital General Crop Estimation Survey (DGCES)**, and supporting IT initiatives by the Central Government, State Governments, and Academic and Research Institutions.
- Additionally, the mission includes **'Soil Profile Mapping'** and aims to enable farmer-centric digital services to provide timely and reliable information for the agriculture sector.

AgriStack: Kisan ki Pehchaan

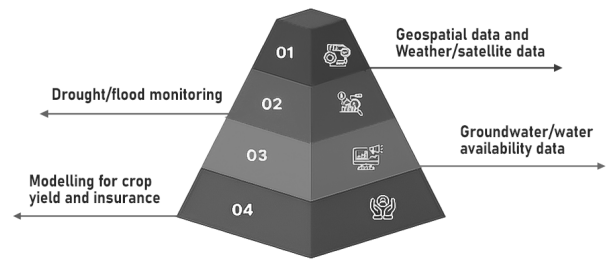
- AgriStack is designed as a **farmer-centric Digital Public Infrastructure (DPI)** to streamline services and scheme delivery to farmers.
- It comprises **three key components**.
 - Farmers’ Registry
 - Geo-referenced village maps
 - Crop Sown Registry



- A crucial feature of AgriStack is the **introduction of a 'Farmer ID'**, similar to Aadhaar card, serving as a trusted digital identity for farmers.
- These IDs, created and maintained by the State Governments/ Union Territories, will be linked to various farmer-related data, including **land records, livestock ownership, crops sown**, and benefits availed.
- The implementation of AgriStack is progressing through **partnerships between the Central and State Governments**, with 19 states having signed MoUs with the Ministry of Agriculture.
- **Pilot projects have been conducted in six states** to test the creation of Farmer IDs and the Digital Crop Survey.
- **Key Targets**
 - Creating **digital identities for 11 crore farmers over three years** (6 crore in FY 2024-25, 3 crores in FY 2025-26, and 2 crores in FY 2026-27).
 - Launching the Digital Crop Survey nationwide within two years, covering 400 districts in FY 2024-25 and all districts in FY 2025-26.

Krishi Decision Support System: The Krishi Decision Support System (DSS) will integrate remote sensing data on crops, soil, weather, and water resources into a comprehensive geospatial system.

Krishi Decision Support System



Soil Profile Mapping: Under the mission, detailed soil profile maps on a 1:10,000 scale for approximately 142 million hectares of agricultural land have been envisaged, with 29 million hectares of soil profile inventory already being mapped.

- Soil Profile Maps on a 1:10,000 scale of about 142 million hectares of the country's agricultural land
- Digital General Crop Estimation Survey (DGCEs) will provide yield estimates based on scientifically designed crop-cutting experiments
- Employment opportunities to about 2.5 lakh trained local youth and Krishi Sakhis
- The digital crop surveys, collection of ground-truthed data for remote sensing

Significance/Benefits of the Mission

- **Seamless Access through Digital Authentication:** Digital authentication for accessing services and benefits, reducing paperwork and the need for physical visits.
- **Improved Efficiency and Transparency in Schemes:** Enhanced efficiency and transparency in government schemes, crop insurance, and loan systems through accurate data on crop area and yield.
- **Better Disaster Response through Crop Mapping:** Crop map generation and monitoring for better disaster response and insurance claims.
- **Strengthening Digital Infrastructure for Advisory Services:** Development of digital infrastructure to optimise value chains and provide tailored advisory services for crop planning, health, pest management, and irrigation.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. How will Agri Stack transform farmer-centric governance and agricultural service delivery in India? [150 words] [10 marks]

CHENAB AND ANJI BRIDGE

Why in News: Recently, Prime Minister Shri Narendra Modi visited Jammu and Kashmir to inaugurate the **Chenab Bridge**—the world’s highest railway arch bridge and the **Anji Bridge**—India’s first cable-stayed rail bridge.

Chenab Rail Bridge

- The Chenab Rail Bridge, the highest railway arch bridge in the world, **stands 359 meters above the Chenab River**—making it about 35 meters taller than the Eiffel Tower.
- This steel arch bridge, which is **1,315 meters long**, was **designed to withstand wind and seismic activity**.
- The bridge will have a significant impact on **improving connectivity between Srinagar and Jammu**.
- The **current travel time between Katra and Srinagar will be cut by two to three hours** thanks to the **Vande Bharat train** that is moving on the bridge.
- **Design and Construction:** **IISc Bengaluru** designed the foundation, and **Konkan Railway Corporation** built the structure. Seismic analysis was done by **IIT Delhi** and **IIT Roorkee**, and **DRDO** confirmed that the bridge is blast-proof.
- It is built to **last through earthquakes of magnitude 8, explosions involving up to 40 tonnes of TNT, temperatures as low as -20°C, and wind speeds of up to 266 km/h**.
- Trains can continue to run at a slower pace even if one of its eight pillars fails.

Anji Bridge

- The Anji Bridge, which will serve the country in difficult terrain, is the **country’s first cable-stayed rail bridge and the second-highest railway bridge**.
- It is built over the Anji River, **which is a tributary of the Chenab River**.
- The bridge is engineered to **endure wind speeds of up to 213 km/h** and ensure safe train movement at speeds reaching 100 km/h.

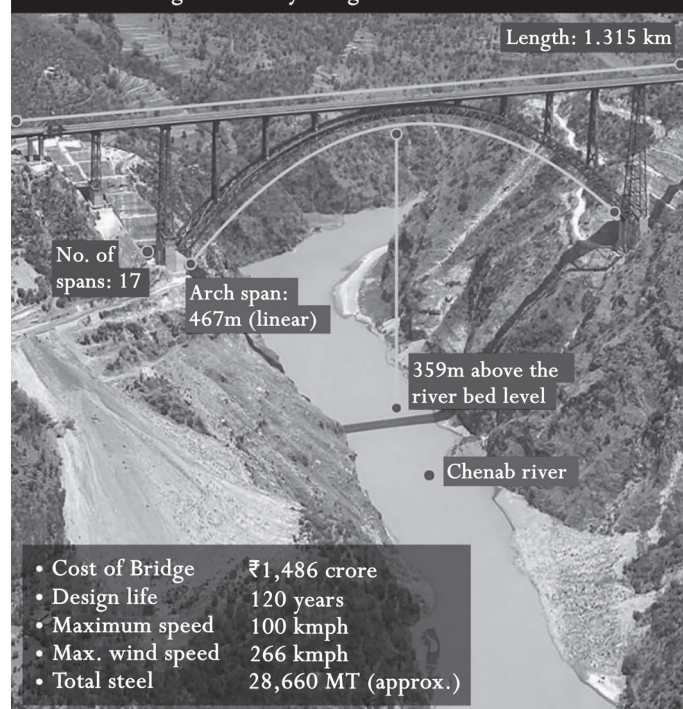
Note: Both bridges are a part of the Udampur-Srinagar-Baramulla Rail Link (USBRL) project, which connects Kashmir to the rest of India via rail in all weather conditions.

Chenab River

- In **Himachal Pradesh**, two streams, **Chandra and Bhaga**, meet to form the Chenab in the western (Punjab) Himalayas.
- Between the jagged cliffs of the Siwalik Range (south) and the Lesser Himalayas (north), it **flows west through Jammu and Kashmir**.
- As it turns southwest, it enters Pakistan and descends into Punjab province’s wide alluvial lowlands from the uplands.
- The Chenab **empties into the Sutlej River**, a tributary of the Indus River, **after receiving the Jhelum River close to Trimmu**.
- It feeds multiple irrigation canals and is roughly 605 miles (974 km) long overall.

Chenab Bridge

World’s highest railway bridge over the Chenab river



EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Chenab River:

1. Recently the world’s highest railway arch bridge was constructed on Chenab River.
2. Chenab river is made up of two streams, Chandra and Bhaga River.
3. It flows through Himachal Pradesh, Jammu & Kashmir and Punjab state of India.

How many of the above given statements are/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Answer: (b) (1 and 2 only)

DHRUVA

Why in News: Recently, the **Department of Posts** released a policy document of DHRUVA (Digital Hub for Reference and Unique Virtual Address) **to create national-level Digital Public Infrastructure (DPI)**.

Key Details: About DHRUVA

- In order to facilitate **safe, consent-based, and easy exchange of address information**, DHRUVA aims to create a standardised, interoperable, and geocoded digital addressing system.
- Its fundamental idea is **Address-as-a-Service (AaaS)**, which refers to the collection of services related to address data management that **facilitate safe and effective communication between users, governmental bodies, and businesses**.
- By using a geo-coded framework, it establishes a **safe online space** where users can exchange precise address information.

Components of DHRUVA

- **Digital Postal Index Number (DIGIPIN):** In order to represent geographic coordinates (latitude-longitude), a **10-digit alphanumeric code** was created by establishing consistent, roughly **4x4 metre grids** on Indian territory. It is intended to be **freely available in the public domain** and enables the **logical location of addresses through a naming pattern with directional properties**.
- **Digital Address Layer:** Users can create **personalized labels to represent their DIGIPIN** and descriptive addresses using this user-centric, consent-based system, which is based on DIGIPIN.

Significance

- **For Citizens**
 - Through this initiative, address information management will be acknowledged as a fundamental public infrastructure that is essential to **inclusive service delivery, efficient governance, and improved user experience**.
 - Through granting user’s significant **control over their address data, the policy fosters innovation, ease of living, and user autonomy**.
- **For Governance**
 - Through widespread adoption by ministries, state governments, and other stakeholders, it seeks to spur innovation across important sectors, including

financial inclusion, e-commerce, logistics, and governance.

- Government officials can use it to **improve urban management and planning**, as well as to **deliver welfare programs more precisely**.
- **For the Private sector**
 - In order to facilitate seamless integration between the public and private sectors, it aims to **establish a strong ecosystem for address data management and sharing**.
 - Additionally, DHRUVA aims to develop a cooperative ecosystem where **public and private stakeholders jointly develop user-centred solutions based on a reliable and secure digital framework**.
 - It makes it **easier for banks, NBFCs, telecoms, and fintech businesses to verify addresses and streamline KYC procedures**.

Conclusion

DHRUVA marks a pioneering step towards establishing a **safe, standardised, and user-centric digital address system** by enhancing governance, improving service delivery, and empowering citizens.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Digital Postal Index Number:

1. It is a 10-digit alphanumeric code created to ensure better address management.
2. It is freely available in public domain for private sector companies.

Which of the above given statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

(c) Answer

INTERNATIONAL BIG CAT ALLIANCE (IBCA)

Why in News: The first Assembly of the International Big Cat Alliance (IBCA) for the conservation of big cats in range countries was held in New Delhi.

Key Details: About the Assembly

- The first Assembly of the IBCA was held on June 16, 2025, in New Delhi. The meeting was **chaired by Union Environment Minister** Bhupender Yadav.
- Ministerial delegations from **nine countries** attended, including Bhutan, Cambodia, Eswatini, Guinea, India, Liberia, Suriname, Somalia, and Kazakhstan.
- During the Assembly, the Union Environment Minister was unanimously endorsed as the President of IBCA.
- **Key documents were ratified and approved**, laying the groundwork for the alliance's effective operations:
 - The **Headquarters Agreement with India**. This ratification is significant as it enables the IBCA to establish its Headquarters and other necessary offices in India, recognising IBCA's international legal personality and the IBCA Secretariat.
 - The Workplan
 - Rules of Procedure of the Assembly.
 - The manual of Staff and Financial Regulations of the IBCA.
- The Assembly also **endorsed the proceedings of the first International Steering Committee meeting of IBCA**, which took place in April 2024.

International Big Cat Alliance



- The International Big Cat Alliance (IBCA) is an initiative launched by India.
- It was **established by the Indian government through the National Tiger Conservation Authority**, operating under the Ministry of Environment, Forest and Climate Change.
- The primary mandate of the IBCA is the conservation of seven big cat species.
 - Tiger
 - Lion
 - Leopard
 - Snow Leopard
 - Cheetah
 - Jaguar
 - Puma
- The IBCA was established in March 2024 by the Indian government.
- **Membership and Reach**
 - **Global Distribution of Big Cats:** There are 95 range countries globally that fall within the natural distribution of these big cat species, including nations like Canada, China, Brazil, Iran, Nepal, Pakistan, Russia, and the United States.
 - **Current Membership:** As of September 2024, twenty-five countries have consented to be members of the IBCA. These include Bangladesh, Nigeria, Egypt, Suriname, Ecuador, Peru, Kenya, and Rwanda.
 - **Membership Process:** All United Nations (UN) member countries are eligible to become members of the IBCA. This can be achieved after a framework agreement is signed and formally conveyed through a Note Verbale, which is a method of diplomatic communication.

Ecological Significance of Big Cat Conservation

- **Ecosystem Regulation:** Big cats regulate prey populations, which in turn helps maintain the health of landscapes.
- **Prevention of Ecological Calamities:** Their presence prevents overgrazing, which can lead to issues like wildfires and disease.

How many of the statements given above are **incorrect**?

- (a) Only one
- (b) Only two
- (c) All three
- (d) None of the above

Answer: (d)

50 YEARS OF CROCODILE CONSERVATION

Why in News: India marks 50 years of its Crocodile Conservation Programme in 2025.

Key Details

- When the Government of India **launched the Crocodile Conservation Project on April 1, 1975**, it was Odisha that emerged as the centre of the country's first scientific efforts to save all **three native species of crocodilians**—the gharial (*Gavialis gangeticus*), the saltwater crocodile (*Crocodylus porosus*), and the mugger (*Crocodylus palustris*)—from the brink of extinction.
- Alarmed by the findings of a survey conducted in **late 1974 by renowned herpetologist H.R. Bustard** that **crocodile populations were on the brink of extinction**, scientific conservation efforts were launched with the assistance of Food and Agriculture Organization of the United Nations
- Odisha is the only State in India to host conservation centres for all three crocodilian species — **Tikarpada for gharial, Dangamal for saltwater crocodile, and Ramatirtha for mugger.**

India's Crocodile Conservation Efforts: 50 Years of Success

- **Recovery of Wild Populations**
 - **Gharial (*Gavialis gangeticus*):** India now **holds nearly 80% of the global wild population of gharials, with an estimated 3,000 individuals.** More than 400 nests are recorded annually across key habitats such as the National Chambal Sanctuary (spanning Uttar Pradesh, Madhya Pradesh, and Rajasthan), Katarnia Ghat Wildlife Sanctuary, Gandak River, Corbett Tiger Reserve, and Son Gharial Sanctuary in Madhya Pradesh. This remarkable recovery is a result of decades of focused conservation and habitat protection.
 - **Saltwater Crocodile (*Crocodylus porosus*):** The saltwater crocodile population has recovered to approximately 2,500 individuals in the wild, with Bhitarkanika in Odisha holding the largest share, followed by the Andaman and Nicobar Islands and the Sundarbans in West Bengal.
 - **Mugger Crocodile (*Crocodylus palustris*):** The mugger crocodile, once severely depleted in numbers, has now reclaimed most of its historical range, with its numbers in the wild estimated at 8,000 to 10,000.

New Gharial Conservation Project (2025 Announcement)

- In March 2025, Prime Minister Narendra Modi announced the launch of a new conservation project specifically aimed at **protecting gharials**. The project is expected to consolidate the species' presence in the Ganga and its tributaries and aims to reintroduce the gharial across its former range, including the Brahmaputra and Indus rivers.

Crocodiles

- Crocodiles are the largest living reptiles and are **primarily found in freshwater** habitats such as swamps, lakes, and rivers, though one species inhabits saltwater.
- They are nocturnal and **poikilothermic**—meaning their body temperature varies with the surrounding environment, a trait typical of ectothermic or cold-blooded animals.
- The largest species of crocodilian is the **saltwater crocodile**, *Crocodylus porosus*, which can measure more than 6 m (20 ft.). The smallest species is the **Cuvier's dwarf caiman**; adult males only reach a maximum length of about 1.6 m (5.2 ft.).

Crocodilian Species in India

Saltwater Crocodile (*Crocodylus porosus*)

The largest living reptile on Earth, with rough, textured skin and a powerful tail.

Conservation Status:

- ◆ IUCN Red List: Least Concern
- ◆ WPA, 1972: Schedule I
- ◆ CITES: Appendix I

Habitat and Distribution:

- ◆ Found in Bhitarkanika, Sundarbans, and the Andaman and Nicobar Islands.
- ◆ Prefers coastal estuaries and mangrove swamps.



Mugger (*Crocodylus palustris*)

Identified by its broad snout; known to dig burrows or holes for nesting.

Conservation Status:

- ◆ IUCN Red List: Vulnerable
- ◆ WPA, 1972: Schedule I
- ◆ CITES: Appendix I

Habitat and Distribution:

- ◆ Found in 15 Indian states, including much of the Ganga River drainage.
- ◆ Inhabits freshwater lakes, rivers, and marshes.



Gharial (*Gavialis gangeticus*)

Has a long, narrow snout with a bulbous knob at the tip; primarily a fish-eater.

Conservation Status:

- ◆ IUCN Red List: Critically Endangered
- ◆ WPA, 1972: Schedule I
- ◆ CITES: Appendix I

Habitat and Distribution:

- ◆ Inhabits freshwater rivers: Chambal, Girwa, Ghagra, Son, and Gandak.
- ◆ Prefers deep, fast-flowing rivers with sandbanks for nesting.



EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding crocodilian species in India:

1. The saltwater crocodile is found in Bhitarkanika, Sundarbans, and the Andaman and Nicobar Islands.
2. The mugger crocodile is found in 15 Indian states including much of the Ganga River drainage.
3. The gharial is listed as Vulnerable in the IUCN Red List and prefers marshy wetlands.

Which of the statements given above are correct?

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

Answer: (a)

TWO NEW RAMSAR SITES

Why in News: Recently two more sites from India have been added to the list of wetlands of international importance, taking the number of such sites in the country to 91.

About the New Sites

Both newly recognized sites are located in **Rajasthan**:

- **Khichan (Phalodi District):**
 - Globally renowned for attracting **thousands of migratory Demoiselle cranes**, Khichan has become a major birdwatching destination.
 - It includes two water bodies—**Ratri Nadi (a river) and Vijaysagar Talab (a pond)**—along with riparian zones and scrubland areas.
 - The wetland plays a critical ecological role by supporting rich biodiversity and providing a vital habitat for migratory birds.
- **Menar (Udaipur District):**
 - Popularly known as Rajasthan's "**Bird Village**", Menar is a notable example of community-led conservation efforts.
 - It hosts several rare and threatened bird species, including the **cinereous vulture, Himalayan griffon, Dalmatian pelican, and black-tailed godwit**.
 - More than **70 plant species are present**, including mango trees (*Mangifera indica*) near Braham Talab, which supports a large colony of Indian flying foxes (*Pteropus giganteus*).

About Wetlands

- A wetland is an area of land that is **either covered by water or saturated with water**. The water is often groundwater, seeping up from an aquifer or spring.
- A wetland's water can also come from a nearby river or lake. Seawater can also create wetlands, especially in coastal areas that experience strong tides.
- A wetland is **entirely covered by water at least part of the year**. The depth and duration of this seasonal flooding varies.
- Wetlands are **transition zones**. They are neither totally dry land nor totally underwater; they have characteristics of both.
- The saturation of wetland soil determines the vegetation that surrounds it. Plants that live in wetlands are **uniquely adapted to their watery (hydric) soil**.
- Wetland plants are called **hydrophytes**. Seasonally dry wetlands or wetlands with slow-moving water can often support trees and other sturdy vegetation. More frequently flooded wetlands have mosses or grasses as their dominant **hydrophytes**.

Ramsar Convention

- It was established on **February 2, 1971, in the city of Ramsar, Iran**.
- It offers a framework for the conservation and sustainable use of wetlands and their resources.
- To qualify as a Ramsar site, a **wetland must satisfy at least one of nine criteria**—such as regularly supporting over 20,000 waterbirds or playing a key role in conserving biodiversity.
- The **Montreux Record** identifies Ramsar sites facing significant human-induced threats and needing urgent conservation measures.
- India became a **signatory to the Convention in 1982**, with Tamil Nadu currently having the highest number of Ramsar sites in the country. India has the highest number of Ramsar sites in Asia.
- **Chilika Lake in Odisha** was the country's **first Ramsar site**. At present, India has **91 Ramsar sites, collectively spanning approximately 13.58 lakh hectares**.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the Ramsar Convention and India's participation:

1. The Montreux Record is a part of the Ramsar Convention framework and includes wetlands threatened exclusively by natural causes such as climate variability and droughts.
2. In 1981, Chilika Lake was designated the first Indian wetland of international importance under the Ramsar Convention.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding oil spills:

- When oil spills into water, it rapidly spreads and, due to its lighter density, forms a layer over the water, obstructing sunlight and disrupting photosynthesis in marine plants and phytoplankton.
- Despite technological advancements, cleaning oil spills remains challenging because oil can vary in properties, with some types sinking or emulsifying with water, making separation difficult.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

(c) Answer

OCEAN ACIDIFICATION

Why in News: The world's oceans are in worse health than realised, scientists have said, as they warn that a key measurement shows we are "running out of time" to protect marine ecosystems.

Key Details

- A recent study by the UK's Plymouth Marine Laboratory, NOAA, and Oregon State University has revealed that the **planetary boundary for ocean acidification was crossed around 2020**.
- Until now, ocean acidification had not been classified as having breached this threshold.
- With this finding, **seven out of nine planetary boundaries have now been crossed**.
- The **boundary for ocean acidification is defined** as a 20% drop in calcium carbonate concentration in seawater from pre-industrial levels.
- The polar regions show the biggest changes in surface ocean acidification, while deeper waters show the largest changes just outside the poles and in upwelling regions.
- The study warns that this development is not only an environmental concern but also a major threat to marine ecosystems and coastal economies.

The planetary **boundaries represent the safe operating limits for Earth's key systems**—such as climate, biodiversity, and water—beyond which their stability is threatened.

Interdependence: The planetary boundaries are interdependent, meaning actions affecting one process can influence the risks of others. Maintaining a safe operating space for humanity requires respecting all nine boundaries. Ocean acidification is identified as the seventh planetary boundary crossed, highlighting the dire state of Earth.

About Ocean Acidification

- Ocean acidification is a critical environmental issue, often referred to as "Climate Change's evil twin," posing significant threats to marine ecosystems and human communities.
- It involves a **continuous decrease in the pH of ocean water**, primarily due to the increased absorption of carbon dioxide (CO₂) from the atmosphere.

Causes of Ocean Acidification

- CO₂ Absorption:** Oceans absorb about 30% of the CO₂ released into the atmosphere from human activities. Over the past 200 years, oceans have absorbed more than 150 billion metric tonnes of CO₂.
- Chemical Reaction:** When CO₂ dissolves in seawater, it forms carbonic acid (H₂CO₃). This weak acid then dissociates into hydrogen ions (H⁺) and bicarbonate ions (HCO₃⁻), leading to an increased concentration of hydrogen ions.
- pH Decrease:** An increase in hydrogen ions lowers the pH of the seawater, making it more acidic. The pH scale is logarithmic, meaning a small decrease in pH represents a significant increase in acidity.

Impacts of Ocean Acidification

- Impacts on Marine Life**
 - **Calcifying Organisms:** Organisms like corals, shellfish (e.g. oysters, clams, mussels, Dungeness crabs), sea urchins, and some plankton (e.g. pteropods or "sea butterflies") are particularly vulnerable. They rely on carbonate ions to build and maintain their shells and skeletons. As acidity increases, carbonate availability decreases, making it difficult for these organisms to form their structures, leading to reduced growth, impaired reproduction, and even dissolution of shells or skeletons if pH levels get too low.
 - **Ecosystem Disruption:** Coral reefs, which are economically and biologically vital marine ecosystems, face additional threats from acidification on top of increasing sea surface temperatures and bleaching.
 - **Potential Benefits for Some Species:** While many species are harmed, algae and seagrasses may benefit from higher CO₂ conditions for photosynthesis, similar to land plants.

Factors Affecting SAI Effectiveness

- Type of Material Injected
 - Time and Location of Injection
 - Altitude of Injection
- Most research focuses on injections at 20 km or higher, especially over equatorial regions.

- Particles released at lower altitudes are more likely to get trapped in clouds and washed out by rain.
- Higher altitude injection is generally more effective as particles remain in the stratosphere for months to years.

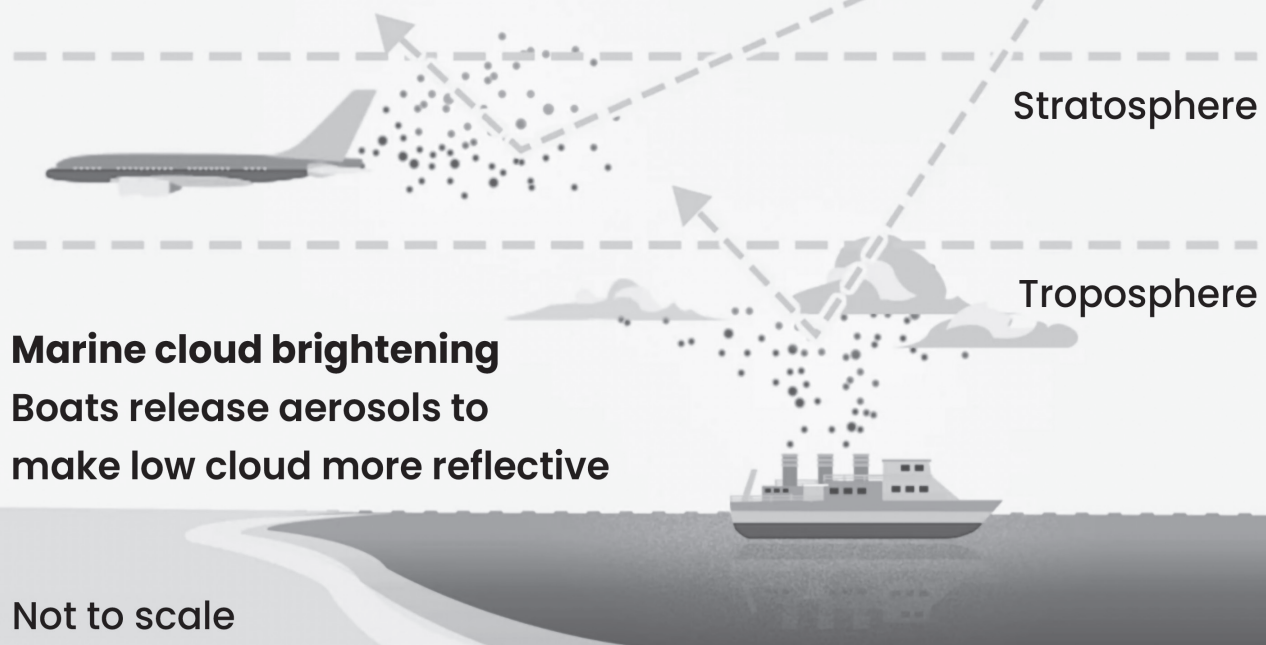
Findings of a study

- According to the study, the planet could cool by about 0.6° C if 12 million tonnes of sulphur dioxide were injected annually at a height of 13 km during the local spring and summer seasons in each hemisphere.

How geo-engineering could cool the atmosphere

Stratospheric aerosol injection

Planes release tiny particles to reflect solar radiation back to space



Marine cloud brightening

Boats release aerosols to make low cloud more reflective

Not to scale

Challenges

- **Environmental Risks:** Risks to the environment include acid rain from sulphur dioxide, damage to the ozone layer that delays its recovery, and uneven cooling (stronger in polar regions, weaker in tropics).
- **Limited Climate Benefits:** Climate change would not be reversed by the cooling effect. The cooling may conceal global warming and encourage nations to relax their emission reduction efforts.
- **Governance Challenges:** The fact that SAI has worldwide repercussions—if one nation releases aerosols into the stratosphere, it will impact all nations, and not always in a positive way—makes it contentious. Due to the fact that the technology cannot be “governed in a fair, democratic, and efficient manner.”

Conclusion

While SAI may offer a temporary solution, it cannot replace emission reduction strategies and must be approached with extreme caution under robust international frameworks.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. What is Stratospheric Aerosol Injection (SAI)? Discuss its potential as a climate intervention tool and highlight the associated environmental and governance challenges. [150 Words] [10 Marks]

URBAN FORESTS IN INDIA

Why in News: One of Hyderabad's last remaining urban forests, Kancha Gachibowli, faced the threat of extinction when the Telangana government decided to give away 400 acres of its land for industrial development.

Key Details

Justifying its move by claiming ownership over the forest, the government alleged that protesting students were misled by real estate interests.

- However, the **Supreme Court took cognisance of the felling of 100 acres of trees** and reprimanded the State government.
- This issue **highlighted the vulnerability of urban forests and environmentally insensitive models of urban development.**
- Recent interventions by the National Green Tribunal (in Bhopal) and the Allahabad High Court (in Uttar Pradesh) against indiscriminate tree felling underscore the growing threat to urban greenery and the urgent need for preservation.

Understanding Urban Forestry and Its Significance

- Urban forestry is defined as 'the art, science and technology of managing trees and forest resources in and around urban community ecosystems for the physiological, sociological, economic, and aesthetic benefits trees provide society.'
- Urban forestry has the **urban forest as its domain.** An urban forest is defined as **comprising all tree-dominated green areas in and around urban areas.**
- Thus, it includes, according to **Food and Agriculture Organization (FAO) definitions**, forests, other wooded land, and trees outside forests, as long as these are situated in urban environments.
- Urban forest patches such as **Kancha Gachibowli (Hyderabad), Aarey (Mumbai), Turahalli (Bengaluru), Neela Hauz and Delhi Ridge (Delhi), and Dol Ka Baadh (Jaipur)** are more than just scenic or recreational areas. They play a critical role in ensuring climate resilience, public health, air purification, groundwater recharge, and maintaining urban ecological balance.

Policy Backing for Urban Forests

- Urban forests have featured in policies, missions, and judicial interventions in India. Both the **National Forest Policy of 1988** and the **National Mission for Green India of 2014** underlined the imperative of increasing afforestation and social forestry.
- The **Smart Cities Mission and Atal Mission for Rejuvenation and Urban Transformation, launched in 2015**, integrated smart urban designs with ecological and social development.

SIGNIFICANCE OF URBAN FORESTS



Ecological Significance



Mitigating climate change



Reducing urban heat island effect



Controlling stormwater runoff, erosion, and flooding



Sequestering carbon and absorbing air pollutants



Socio-Cultural and Psychological Value



Mental health benefits through proximity to nature



Recreational spaces for city dwellers



Cultural and community identity for neighborhoods



Supporting spiritual and cultural traditions linked to nature worship

Role of Judiciary in Strengthening Forest Protection

Judicial pronouncements have played a crucial role in broadening the legal interpretation and protection of forests:

- **T.N. Godavarman Case (1996):** Expanded the definition of forests, bringing more areas under protection.
- **Supreme Court Orders (2004):** Directed all States to identify, map, and monitor forests across their territories, creating a nationwide forest inventory.
- **Delhi High Court (2015):** Directed the Delhi government to protect the Delhi Ridge and Aravalli wildlife corridor.
- **Supreme Court Stay on Aarey Tree Felling (2020):** Responded to citizen petitions under the Save Aarey Forest movement in Mumbai.
- **Rajasthan High Court (2024):** Took suo motu cognisance of tree felling in the biodiversity-rich Baran district following public protests.

Nagar Van Yojna

- The **Ministry of Environment, Forest and Climate Change (MoEF&CC)** of the Government of India had rolled out the Nagar Van Yojana (urban forest scheme) in 2020.
- The objective was to promote and grow forest spaces in urban areas. The Nagar Van Yojna envisages **developing a thousand urban forests by the year 2027.**

- A key feature of the scheme is **community involvement, encouraging local bodies, civic groups, and resident associations** to adopt, develop, and maintain these forests, fostering a sense of stewardship and public ownership.
- According to the **India State of Forest Report 2023**, the scheme has resulted in an increase of 1445.81 km of tree and forest cover.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Urban forests are essential for ecological sustainability and climate resilience, yet they remain vulnerable to rapid urbanisation and weak regulatory safeguards. In this context, examine the ecological and socio-cultural significance of urban forests and critically analyse the role of policies, judiciary, and community participation in their conservation. [250 Words] [15 Marks]






GLACIER PRESERVATION AND CLIMATE RESILIENCE

Why in News: India reaffirms Commitment to Glacier Preservation at the High-Level International Conference in Dushanbe.

Key Details

- Union Minister of State for Environment, Forest and Climate Change (EFCC), addressed the Plenary Session of the **High-Level International Conference on Glaciers’ Preservation**, held in Dushanbe, Republic of Tajikistan.
- The event brought together international experts, policy makers, and Ministers to deliberate on urgent actions needed to safeguard glaciers, which serve as critical freshwater reservoirs and indicators of climate change.

Significance of Glaciers

-  **Freshwater Reservoirs:** Store 75% of Earth's freshwater; second-largest water reservoir overall.
-  **River Source:** Feed major rivers (e.g., Gangotri Glacier: Ganga River), vital for drinking water and electricity.
-  **Temperature Regulation:** Cold glacial runoff helps maintain stream temperature downstream.
-  **Aquatic Ecosystems:** Support cold-water species; essential for survival of aquatic insects, trout, and salmon.
-  **Agriculture & Resources:** Glacial till provides fertile soil.
 - ▶ Sand and gravel from glaciers used in concrete and asphalt.

India’s Response to Glacial Retreat in the Himalayas

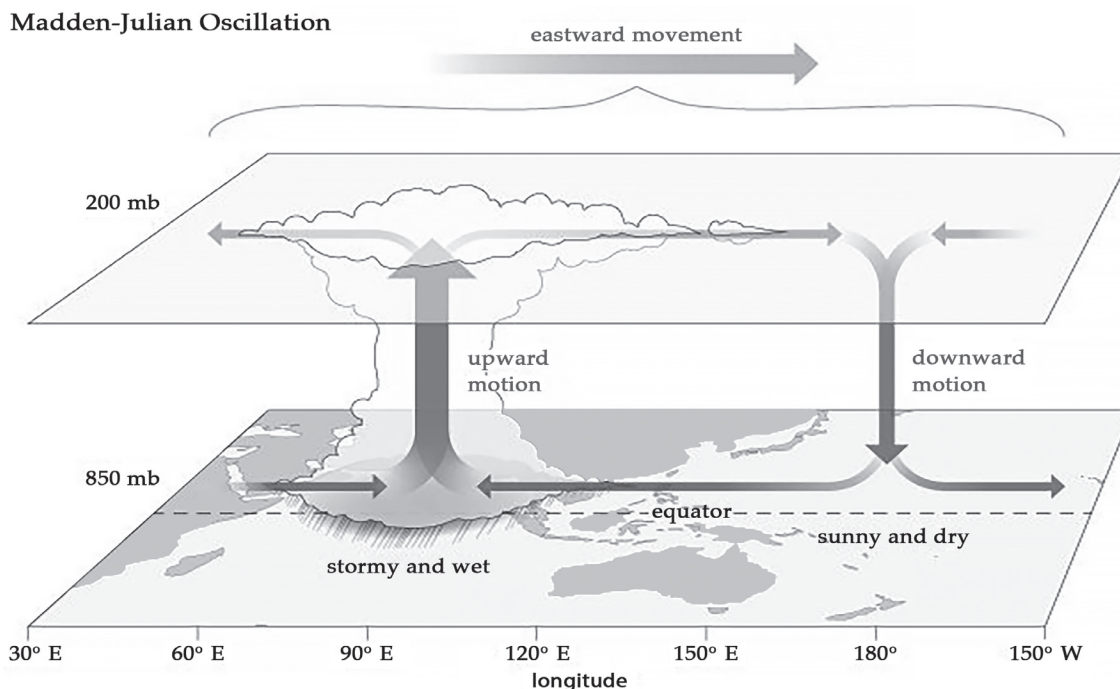
- **Glacial Retreat and India’s Concerns:** Glacial retreat is accelerating globally, with mountain regions like the Himalayas facing disproportionate impacts. India, deeply linked to the Himalayan ecosystem, has raised strong concern and is implementing targeted adaptation and monitoring strategies.
- **Strategic Action under NAPCC:** India is taking key initiatives under the National Mission for Sustaining the Himalayan Ecosystem (NMSHE)—part of the National Action Plan on Climate Change (NAPCC). A Centre for Cryosphere and Climate Change Studies has been set up to support glacier and glacial lake monitoring.
- **Use of Advanced Technology:** The Indian Space Research Organisation (ISRO) is employing Remote Sensing and Geographic Information System (GIS) technologies to track glacier mass and dynamics.
 - This is complemented by research from national institutes such as the National Centre for Polar and Ocean Research (NCPOR), National Institute of Hydrology (NIH), Wadia Institute of Himalayan Geology, and the G.B. Pant National Institute of Himalayan Environment (NIHE). These efforts aid in scientific understanding and policy-making for sustainable water resource management.
- **Disaster Preparedness and GLOF Risk Mapping:** The National Disaster Management Authority (NDMA) is enhancing early warning systems and mapping Glacial Lake Outburst Flood (GLOF) risks. Emphasis is placed on regional cooperation for resilience-building, improved data sharing, and coordinated responses to mountain ecosystem challenges.
- **Global Climate Commitment:** India reaffirmed its support for equity and the principle of Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC) in global climate action. Despite South Asia’s low contribution to global emissions, the region remains highly vulnerable to climate change impacts.

India’s Progress on Climate Goals under the Paris Agreement

India has adopted a balanced and ambitious climate strategy aligned with its developmental priorities. The country has made substantial progress in meeting its Nationally Determined Contributions (NDCs) under the Paris Agreement. **Key achievements include:**

- **Non-Fossil Fuel-Based Energy:** Over 48% of the installed electricity capacity now comes from non-fossil fuel sources, including solar, wind, hydro, and nuclear energy.
- **Reduction in Emission Intensity:** India achieved a 36% reduction in the emission intensity of its GDP between 2005 and 2020, surpassing the earlier target of 33–35% by 2030.
- **Carbon Sink Creation:** Between 2005 and 2021, India created an additional carbon sink of 2.29 billion tonnes of CO equivalent through increased forest and tree cover.

- The system typically travels eastward at a speed of 4-8 metres per second. It goes around the globe in 30-60 days on average, but can sometimes take 90 days.



Phases and Rainfall Impact

- As it moves, strong MJO activity often splits the planet into two parts — one in which the MJO is in **active phase** and brings rainfall, and the other in which it suppresses rainfall. In the active phase, MJO results in higher-than-average rainfall for that time of the year, while in the **suppressed phase**, the area receives less than average rainfall.
- An active phase is generally followed by a weak or suppressed phase, in which there is little MJO activity.

Geographical Influence

- The effect of the MJO is witnessed **mainly in the tropical region**, in the band between 30 degrees North and 30 degrees South of the equator, even though the mid-latitude regions in both hemispheres also feel its impact.
- India falls in this band. As the MJO cycle lasts only 30-60 days, there can be multiple MJO events in a season.

Madden-Julian Oscillation and EL-NINO

- There is some evidence that the MJO and El Niño — the unusual warming of sea-surface Pacific waters off the South American coast — are correlated.
- Thus, strong MJO activity, like this year, is witnessed in a year of strong El Niño. However, the correlation is not exclusive: a strong El Niño year — the strength being a measure of the increase of temperature of sea surface water — is generally associated with a bad monsoon.

How did the MJO contribute to the early monsoon onset?

- In the tropics, MJO in its active phase brings frequent cyclonic activity, and can initiate the onset of the monsoon.

For instance, in June 2015, the MJO resulted in about 20 days of very good rainfall in most parts of the country.

- This is what could have happened this year as well. That is because around May 22, the MJO, which had originated in the Indian Ocean, was in **Phase 4 with an amplitude greater than 1, which is indicative of strong rainfall and storms**, according to IMD's extended range forecast.

Other factors that contributed to the early onset of Monsoon

- **Mascarene High:** The IMD describes the Mascarene High as a high-pressure area found around the Mascarene Islands (in the south Indian Ocean) during the monsoon period. The variation in the intensity of high pressure is responsible for heavy rains along India's west coast.
- **Convection:** An increase in the convective activity, that is, the vertical transport of heat and moisture in the atmosphere, also brings rainfall. For example, a convective system over Haryana moved southeastward last week and led to rains in the Delhi region.
- **The Somali jet:** It is a low-level, inter-hemispheric cross-equatorial wind band originating near Mauritius and north Madagascar. During May, after crossing the east coast of Africa, it reaches the Arabian Sea and the west coast of India. A strong Somali jet is associated with the strengthening of monsoon winds.
- **Heat-low:** Following the movement of the Sun to the northern hemisphere, marking the summer season, a low-pressure area develops in the Arabian Sea. The development of a heat-low pressure zone over Pakistan and adjoining areas acted as a suction device for moist air along the monsoon trough, and its strong presence influences good monsoon rainfall.

Conclusion

The early onset of the Indian monsoon this year highlights the **critical influence of the Madden-Julian Oscillation**, especially in its active phase, on regional rainfall and cyclonic activity. However, the monsoon is a complex phenomenon shaped by multiple interacting systems, including the Mascarene High, Somali Jet, convective processes, and heat-low formations. **Understanding these dynamic interactions**, along with global factors like El Niño, is essential for improving seasonal forecasts and building climate resilience in monsoon-dependent regions like India.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the role of intraseasonal oscillations such as the Madden-Julian Oscillation (MJO) in influencing the Indian monsoon onset and variability. How do these interact with other atmospheric and oceanic phenomena like El Niño, the Somali Jet, and Mascarene High to shape monsoon outcomes?
[250 Words] [15 marks]

URBAN FLOODS

Why in News: Recently, heavy pre-monsoon thundershowers brought Bengaluru to a standstill, with the city recording 130 mm of rainfall over 12 hours — highlighting the city's growing vulnerability to urban flooding.

Urban Flooding in India

- Urban flooding is a recurring problem in Indian cities that has gained significant attention in policy discussions due to its massive impact on infrastructure, property, lives, and the economy.
- Urban flooding refers to **instances where cities receive large amounts of water from heavy precipitation or other sources** like rapid snowmelt or storm surges, coupled with the inability of city infrastructure to drain the water quickly enough.

Causes of Urban Floods

- **Natural Causes:** Urban floods are intensified by extreme rainfall, rapid snowmelt, and storm surges. Climate change has increased the frequency and intensity of these events, especially on India's west coast. IPCC reports confirm rising monsoon precipitation and extreme wet events due to global warming.
- **Planning Deficits:** Lack of poverty planning pushes migrants to settle in flood-prone areas like riverbanks and drains, leading to encroachments, silted drains, and poor stormwater systems. Migrant pressure is concentrated in a few cities due to weak urban economies.
- **Governance Shortfalls:** Urban local bodies have limited powers, while multiple agencies manage services without coordination. This fragmented system, as seen in Bengaluru, hampers crisis response and flood mitigation.

- **Urbanisation and Infrastructure Issues:** Encroachment and concretisation of lakes and wetlands have damaged natural drainage. Stormwater systems are inadequate and clogged. Poor waste management, unauthorised construction, and neglected infrastructure worsen flooding. Over-densification further strains urban ecosystems and increases flood vulnerability.

Impacts of Urban Floods

- **Loss and Damage:** They cause massive loss of infrastructure, property, and lives.
- **Economic Disruption:** They disrupt normal life, cause economic dislocation, and have substantial economic impacts and financial losses, especially in cities which are economic hubs.
- **Service Failures:** Roads may be damaged, mobile phone networks may become inoperative, and electricity lines may be disconnected as a safety precaution.
- **Health Risks:** As floodwaters recede, cities face potential outbreaks of diseases like cholera and malaria.

Measures Taken by the Government to Curtail Urban Floods

- **Jal Shakti Abhiyan (JSA):** Special emphasis is being given to rainwater harvesting/groundwater recharge.
- **Amrit Sarovar Mission:** Launched with an aim of developing and rejuvenating 75 water bodies in each district of the country as a part of the celebration of Azadi ka Amrit Mahotsav for rainwater harvesting/recharge.
- **Atal Bhujal Yojana:** The Central Government is implementing Atal Bhujal Yojana involving the local communities at the village level in collaboration with States, in certain water-stressed areas of Gujarat, Haryana, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan and Uttar Pradesh.
- **Atal Mission for Rejuvenation and Urban Transformation (AMRUT) 2.0 Scheme:** The provisions have been made for harvesting the rainwater through storm water drains into a water body (which is not receiving sewage/effluent) & creation/ strengthening of storm water drains around the water body.
- **Model Building Bye Laws (MBBL), 2016:** All buildings having a plot size of 100 m² or more shall mandatorily include the complete proposal of rainwater harvesting.

Way Forward

- **Inter-agency Synchronisation:** States must ensure proper synchronisation between their own agencies and those of the central government to prepare for and mitigate urban floods.
- **Pre-disaster Planning:** States particularly vulnerable to extreme precipitation events should prioritise pre-disaster planning and integrate climate change mitigation into disaster risk management.
- **National Policy on Densification:** India needs a national policy to disincentive demographic density beyond a sustainable limit.

- **Sustainable Urban Growth:** A significant program should be initiated to invest in and develop smaller cities to ease migration pressures on large cities and encourage sustainable growth elsewhere.

Conclusion

Urban flooding is an escalating and persistent challenge for Indian cities, **stemming from climate change, planning deficits, and unsustainable urbanisation.** Effectively tackling this demands a proactive, integrated approach, including robust pre-disaster planning, inter-agency synchronisation, and central-state financial and technical support. Implementing green infrastructure, tightening regulations, and addressing urban over-densification are crucial for building resilient and functional cities.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. What are the primary causes and contributing factors to urban flooding in India? How have policy and governance evolved in India to address urban flooding?
[250 words] [15 marks]

FLOODS IN NORTH-EAST INDIA

Why in News: Relentless monsoon rains have triggered deadly landslides and flash floods across India's Northeast, leaving at least 30 people dead and over 60,000 affected.

Key Details: Socio-Economic Impacts

- **Widespread Devastation:** Floods have affected hundreds of thousands of people, damaged vast areas of cropland, and swept away animals.
- **Loss of Life:** More than 30 people died across the region, with initial reports indicating at least 32 deaths in 24 hours across five states. The overall death toll had reached 36 fatalities across multiple states, including Assam, Arunachal Pradesh, Meghalaya, Mizoram, Sikkim, and Manipur.
- **Disruption of Daily Life:** Floodwaters shut down roads, schools, offices, and markets in affected areas. Road, rail, and ferry services were disrupted in Assam.
- **Economic Loss:** Farmers have suffered huge financial losses, with their entire fish stock vanishing and crops being wiped out. Recovery from such shocks can take a decade. Education certificates were also washed away, posing long-term problems.

Challenges Associated with Floods in North-East India

- **Geographical and Climatic Factors**
 - **Hilly Terrain and Steep Slopes:** These features facilitate rapid runoff during heavy rains, leading to flash floods and landslides. The region is described as having fragile infrastructure.

- **High Rainfall:** The area receives substantial monsoon rainfall, often exceeding the land's absorption capacity.
- **River Systems:** Major rivers like the Brahmaputra and Barak, along with their tributaries, frequently overflow during the monsoon season.
- **Human Activities and Infrastructural Challenges**
 - **Deforestation and Land Use Changes:** Human activities have reduced natural vegetation cover, diminishing the land's ability to absorb rainwater.
 - **Inadequate Drainage Systems and Unplanned Settlements:** Urban centres like Guwahati face additional challenges from poor drainage and unplanned settlements on vulnerable slopes. Many residents continue living in 366 identified landslide-prone hilly locations in Guwahati despite warnings.
 - **Rapid Urbanisation:** Cities like Guwahati and Silchar have been especially hard hit due to rapid urbanisation exacerbating their drainage problems.
- **Governance and Planning Failures**
 - **Lack of Climate Planning:** There is a glaring lack of plans to meet climate disasters, which are becoming the norm.
 - **Ad-hoc Fixes:** Government actions often involve ad-hoc fixes, such as using JCBs to fix broken embankments or initiating eviction drives, which do not amount to long-term solutions.
 - **Poor Implementation of Acts:** Despite acts like the Manipur Flood Zoning Act, 1978, which allows the state to identify flood zones and regulate development, no proper demarcation has been made, leading to increasing losses with every flood.
 - **Limited Government Jurisdiction:** In regions like the Sixth Schedule areas, traditional institutions control vast territories with autonomy but lack clear regulation or enforceable guidelines. The state has limited jurisdiction and is unwilling to interfere due to the sensitive political issue of indigenous land rights, leading to widespread ecological degradation.
 - **Lack of Media Attention:** Despite losses running into crores in Ziro, Arunachal Pradesh, there was little media attention. The flood story usually ends with the flood for mainstream media, with little attention given to what happens afterwards.
- **Role of Climate Change**
 - Meteorologists and analysts point to climate change as an aggravating factor. The **Northeast is considered among India's most climate-sensitive regions.**
 - There is increasing evidence of more intense and erratic rainfall patterns, which increase the likelihood and severity of disasters like floods and landslides. This includes disruption to hydrological systems and an increase in the frequency of extreme weather conditions like cloud bursts.

Way Forward for Flood Management in North-East India

- **Proactive Planning and Long-Term Strategy**
 - Develop better flood management and disaster preparedness plans.
 - Adopt an informed, long-term preventive approach instead of ad-hoc fixes.
 - Improve early warning systems and disaster response infrastructure.
- **Sustainable Infrastructure Development**
 - Design future infrastructure keeping in mind the region's geography and its people. This implies moving away from traditional engineering fixes that are proving inadequate in a climate-disrupted present.
 - Conduct prior studies or assessments before building roads to prevent landslides and ensure usability during monsoons.
 - Undo the damage caused to nature, recognising that "we cannot tame nature". This suggests a need for more ecologically sensitive development.
- **Effective Governance and Regulation**
 - Implement proper demarcation of flood zones and regulate development in these areas, as intended by acts like the Manipur Flood Zoning Act, 1978.
 - Establish clear regulations and enforceable guidelines for traditional institutions and communities that control vast territories, especially in Sixth Schedule areas, to prevent ecological degradation from activities like uncontrolled quarrying.
 - Address issues of limited jurisdiction and willingness to interfere by state authorities, acknowledging the sensitivity of indigenous land rights while ensuring environmental protection.
- **Climate Change Adaptation:** Acknowledge and integrate the impact of increasingly erratic and intense rainfall patterns due to climate change into all future planning and infrastructure development.

Conclusion

North-East India is increasingly **vulnerable** to extreme weather events like floods, where a combination of natural susceptibility, human-induced environmental degradation, and a **reactive, rather than proactive**, disaster management approach exacerbates the impact of climate change. The lack of a strategic, long-term approach to flood management is a critical missing piece in addressing this escalating crisis.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the geographical, anthropogenic, and governance-related factors contributing to flood vulnerability in Northeast India. Also, suggest a long-term strategy for sustainable flood management in the region.
[250 words] [15 marks]

INTERNATIONAL CONFERENCE ON DISASTER RESILIENT INFRASTRUCTURE

Why in News: Prime Minister Narendra Modi addressed the International Conference on Disaster Resilient Infrastructure 2025 via videoconferencing and highlighted five key global priorities.

Key Details: PM's 5 Key Global Priorities

- **Integrating Disaster Resilience Education:** The Prime Minister emphasised the importance of incorporating disaster resilience courses, modules, and skill development programs into higher education. This aims to cultivate a skilled workforce prepared to address future challenges.
- **Establishing a Global Digital Repository:** Stressed the need for a worldwide digital repository. This repository would document best practices and lessons learned from countries that have successfully faced disasters and rebuilt with resilience.
- **Innovative Financing and Actionable Programs:** Called for innovative financing mechanisms and the creation of actionable programs. The goal is to ensure that developing nations have access to the necessary funds for disaster resilience efforts.
- **Special Attention to Small Island Developing States (SIDS):** Reaffirmed India's recognition of Small Island Developing States (SIDS) as "Large Ocean Countries." He underscored the necessity of providing special attention to their unique vulnerabilities.
- **Strengthening Early Warning Systems and Coordination:** Highlighted the critical need to strengthen early warning systems and improve coordination. These systems play a vital role in facilitating timely decision-making and effective last-mile communication.

International Conference on Disaster Resilient Infrastructure (ICDRI) 2025

- **Theme:** Shaping a Resilient Future for Coastal Regions
- ICDRI 2025 aspires to shape a future where coastal regions, **particularly Small Island Developing States (SIDS)**, are equipped to withstand climate-induced threats while fostering economic stability and ecological sustainability.
- This global convening serves as a pivotal platform to drive discussions and concrete actions on climate adaptation, coastal resilience, and sustainable development.
- By bridging science, policy, and finance, it aims to forge a safer, more resilient future for vulnerable coastal communities worldwide.
- ICDRI 2025 has launched a **call to action for coastal resilience**, strategised by global experts.

MENDEL'S LAW OF INHERITANCE

Why in News: Scientists have finally resolved the 160-year-old genetic mystery behind Mendel's pea plant traits by identifying the specific genes responsible for the last three uncharacterized traits.

Mendel's Pioneering Work on Pea Plants

- **Experimental Period and Scope:** Gregor Johann Mendel began his experiments on pea plants (*Pisum sativum*) in 1856, diligently working for eight years on more than 10,000 plants to understand trait inheritance.
- Sixteen years after Mendel's death in 1884, in the year 1900, **three scientists—Hugo de Vries, Carl Correns, and Erich von Tschermak**—independently rediscovered his work. They realised that Mendel had indeed answered the question of whether parental traits are passed on with varying frequencies.
- **Key Observations and Discoveries**
 - Mendel studied the inheritance patterns of seven traits in pea plants, each having two clearly distinguishable forms. **These traits included:**
 - ◆ Seed shape (round or wrinkled)
 - ◆ Seed colour (yellow or green)
 - ◆ Flower colour (purple or white)
 - ◆ Pod shape (inflated or constricted)
 - ◆ Pod colour (green or yellow)
 - ◆ Flower position (along the stem or at the end)
 - ◆ Plant height (tall or short)
 - **Dominance in F1 Generation:** He observed that when **crossing plants with opposing traits, one form consistently dominated the other.** For instance, crossing round-seeded and wrinkled-seeded plants always produced first-generation (F1) offspring with round seeds.
 - **3:1 Ratio in F2 Generation:** In the second generation (F2) produced by crossing two first-generation plants, the previously hidden form (e.g. wrinkled) **reappeared at a lower frequency, consistently showing a 3:1 ratio of dominant to recessive traits** (e.g. round to wrinkled seeds).

Impact on Genetics

Mendel's work laid the **foundation for modern genetics by showing that:**

- Traits are inherited through discrete units (now called genes).
- Each organism carries two alleles for every gene, one from each parent.
- These alleles may be dominant or recessive, and inheritance follows predictable patterns.
- His work later contributed to the chromosome theory of inheritance.

Century-Old Genetics Mystery Solved

- **Unanswered Questions:** Despite the profound impact of Mendel's work, the specific genetic differences responsible for the two forms of his seven studied traits remained unanswered for a long time, taking 108 years for the scientific community to fully understand.

Key Findings from the New Study

- **Genetic Complexity of Pisum Genus:** While traditionally thought to comprise four species, genetic analysis revealed that the **genus *Pisum* actually forms eight genetic groups**, with the four species distributed across these groups due to extensive crosses and admixtures. This indicates a more complex population structure than previously recognised.
- **Identification of Genes for Remaining Traits:** The study successfully identified the genes involved in the three previously uncharacterized traits:
 - **Pod colour:** A deletion of a segment of DNA before the ChIG gene disrupts chlorophyll synthesis, leading to yellow pods.
 - **Constricted pod shape:** Changes near the MYB gene combined with changes in CLE-peptide-encoding genes result in this trait.
 - **Flower position** (at the end of the stem): A small deletion in the DNA containing the CIK-like-coreceptor-kinase gene, along with a modifier locus, is associated with this characteristic.
- **New Allelic Variants for Known Traits:** The team also identified additional allelic variants that contribute to the four previously characterised traits (seed shape, seed colour, plant height, and flower colour), showing that the genetic picture is more complex than Mendel originally observed. For example, a new variant in white-flowered plants can cause them to produce purple flowers again.

Implications and Future Promise

- **Paving the Way for Future Research:** While solving a 160-year-old mystery, the study has opened doors to something greater, providing a depth of genetic information with enormous promise for future research.
- **Agricultural and Environmental Applications:** The findings have significant implications for:
 - Increasing crop yield
 - Enhancing disease resistance
 - Improving environmental adaptations

Mendel's Laws of Inheritance

- **Law of Dominance:** This law states that when two different alleles for a trait are present, one allele (the dominant allele) will be expressed in the phenotype, while the other (the recessive allele) may not be.
- **Law of Segregation:** This law explains that during gamete formation (sperm and egg cells), the two alleles for a trait separate, and each gamete receives only one allele. This ensures that offspring inherit one allele from each parent.
- **Law of Independent Assortment:** This law states that the alleles for different traits segregate independently of each other during gamete formation. In simpler terms, the inheritance of one trait does not influence the inheritance of another.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements:

1. Mendel's Law of Segregation states that alleles of a gene separate during gamete formation.
2. The Law of Independent Assortment applies only to genes located on the same chromosome.
3. Mendel used *Pisum sativum* (pea plant) for his experiments because it showed clear contrasting traits.

Which of the statements above are correct?

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

Answer: (c)

SPArc THERAPY

Why in News: Recently, a team of experts from the US has successfully used **Step-and-Shoot-Spot-Scanning Proton Arc therapy (SPArc)** to treat a 46-year-old patient suffering from adenoid cystic carcinoma.

What is SPArc Therapy?

- SPArc is an advanced form of proton therapy that uses **precisely targeted proton beams to destroy cancer cells** while minimizing damage to surrounding healthy tissues.

Key Features and Mechanism

- **Precision Targeting:** SPArc employs a scanning nozzle to deliver proton beams layer by layer, focusing on the tumour and sparing surrounding tissues.
- **Layered Energy Delivery:** A computer program maps all possible locations and energy layers where proton beams can be directed. Each energy layer represents a section of tissue exposed to protons with a specific energy level. After delivering radiation to one layer by sweeping across multiple targeted spots, the device moves to the next energy level with a slightly deeper range and repeats the process.
- **Mode of Action:** Radiation damages the DNA (deoxyribonucleic acid) of cancer cells, either killing them or inhibiting their growth.
- **Clinical Significance:** SPArc is especially beneficial in cases of large or complex tumours, where it can precisely target malignant cells with minimal collateral damage to adjacent healthy tissues.

Advantages over Traditional Techniques (SFO-IMPT):

- SPArc therapy significantly reduces radiation exposure to critical organs:
 - Brainstem: Reduced by 10%
 - Optic Chiasm: Reduced by 56%
 - Oral Cavity: Reduced by 72%
 - Spinal Canal: Reduced by 90%



■ A team has used step-and-shoot proton arc therapy to treat a parotid gland cancer for the first time

■ The therapy significantly minimised damage to nearby organs over SFO-IMPT, the current standard of care

■ A 46 y.o. woman received step-and-shoot SPARC after her parotid-gland cancer had spread towards the base of her skull

■ In June-August 2024, she completed 33 sessions with step-and-shoot SPARC and received 66 grays of radiation

■ In this time, the woman reportedly had "minor skin irritation" and no issues eating or continuing working

■ Synthetic CT scans were used to track dose delivery, the therapy's performance, and develop adaptive treatment plans

Challenges

- **Small tumours:** The worry with very precise radiotherapy delivery is that **small tumours can be missed**, referred to as geographical miss, **because movements as subtle as breathing can change their position and make them grow smaller over the course of treatment, leading to inferior cancer cure rates.**
- **Cost:** **Cost is another major concern.** These technologies are typically only appropriate for a small patient population and are highly costly. This **puts a heavy financial strain on the healthcare system and** increases the possibility that it will be used when it is not recommended.

Other Ways for Treating Cancer

- **Chemotherapy:** It is sometimes referred to as “chemo” and is a kind of cancer treatment in which drugs are used to destroy cancer cells.
- **Hormone therapy:** It is a type of cancer treatment that either blocks the body’s ability to produce hormones or interferes with how hormones affect cancer cells.
- **Hyperthermia:** A form of treatment called hyperthermia involves heating body tissue to 113°F in order to kill and damage cancer cells while causing little to no damage to healthy tissue.
- **Photodynamic therapy:** To kill cancer cells, photodynamic therapy employs a medication known as a photosensitizer or photosensitising agent that is activated by light. A laser or another type of source, like LEDs, could be the source of the light.

Conclusion

While SPARC therapy showcases the promise of **futuristic, personalized cancer care, a balanced approach** involving cost-effectiveness, accessibility, and health equity is essential before widespread adoption in India.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Which of the following statements regarding SPARC therapy is/are correct?

1. It uses protons to target tumours while minimizing damage to surrounding healthy tissues.
2. SPARC therapy is more effective for small, fast-shrinking tumours due to its high precision.
3. A major challenge of SPARC therapy is the risk of “geographical miss” due to tumour movement.
4. High cost and limited applicability make it suitable for only a small group of patients.

Select the correct answer using the code below:

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

(b) :Answer

AMOEBIc MENINGOENCEPHALITIS

Why in News: Recently, Kerala’s State Public Health Laboratory developed its own molecular diagnostic **test kits to identify five common species of free-living amoeba, which are toxic to humans and which can cause amoebic meningoencephalitis.**

Key Details

- In cases of amoebic meningoencephalitis, life-saving measures depend on **early pathogen identification and treatment.**
- Although the environment contains more than 400 species of free-living amoeba, only a small number of these have been shown to be harmful to humans, such as **Balamuthia mandrillaris, Paravahlkampfia francinae, Vermamoeba vermiformis, Naegleria fowleri, and Acanthamoeba spp.**

Amoebic meningoencephalitis

- It is an **infection of the brain and the meninges**, which are the membranes that cover the brain.
- It is brought on by a tiny, single-celled organism known as an amoeba, **Naegleria fowleri.**
- The infection-causing amoeba is found in **shallow surface waters** and poorly maintained spas, hot tubs, and swimming pools, especially in warm climates.
- When contaminated water **gets into the nose, infection happens.** Through the nose, the **amoeba then enters the meninges and brain.**
- Young, active people are primarily affected by this uncommon illness. It is almost always fatal.

Diagnosis

- **Examining the cerebrospinal fluid (CSF)**, which surrounds the brain and spinal cord, allows for the diagnosis of the infection because the amoeba that causes it can be seen under a microscope.
- Although recovery is uncommon, prompt diagnosis and treatment with certain antibiotics may be helpful in the treatment of amoebic meningoencephalitis.

About Amoeba

- **Single-celled eukaryotic organism** that belongs to the group of organisms known as **protozoa**.
- **Habitat:** Although most amoebas live in **freshwater** habitats, some species can be found in **soil, saltwater, and even artificial water systems**.
- **Movement and Structure:** It moves by **extending and retracting short-lived projections known as pseudopodia**, or false feet. These extensions are produced when a frontal bulge is formed by the cytoplasm flowing forward in the direction of movement.
- **Nutrition:** They **consume microscopic protozoa, plant cells, algae, and bacteria**. The amoeba **surrounds its prey with pseudopodia during the feeding process**, known as **phagocytosis**, creating a food vacuole where enzymes break down the food.
- **Reproduction:** Binary fission is the **asexual reproduction** method used by amoebas. This process creates two genetically identical amoebae by first dividing the amoeba's nucleus into two sections (mitosis) and then dividing the cytoplasm (cytokinesis).

Conclusion

Amoebic meningoencephalitis is a rare but deadly brain infection. Kerala's development of diagnostic kits is a **crucial step toward early detection and timely treatment**, improving chances of survival.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Amoebic meningoencephalitis:

1. It is caused by an amoeba called *Naegleria fowleri*, which typically enters the body through the nose.
2. The disease is commonly transmitted by drinking contaminated water found in shallow, warm freshwater sources.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Answer: (a)

INDIA'S FIRST GENE-EDITED SHEEP

Why in News: A team of researchers from the Sher-e-Kashmir University of Agricultural Sciences (SKUAST) in Srinagar has produced India's first gene-edited sheep.

Research and Development

- **Lead Institution and Researcher:** The research was conducted by a team at SKUAST-Kashmir, led by Prof. Riaz Ahmad Shah, Dean of the Faculty of Veterinary Sciences.
- **Funding:** The project was sponsored by the Indian Council of Agricultural Research (ICAR).
- **Technology Used:** The gene editing was performed using CRISPR-Cas9 technology, which adheres to international biosafety protocols. CRISPR won the 2020 Nobel Prize in Chemistry.
- **Targeted Gene:** The gene-edited lamb was modified for the '**myostatin**' gene, which is a regulator of muscle growth.
- **Result:** By disrupting this gene, the **muscle mass in the animal is enhanced by nearly 30 per cent**. This specific trait of increased muscle mass is naturally absent in Indian sheep breeds but is known in select European breeds like the Texel.
 - The primary immediate benefit is the ability to produce sheep with nearly 30% more muscle weight, leading to heavier animals. This could lead to increased productivity for farmers.

Gene Editing

- Gene editing, also known as genome editing, involves technologies that allow scientists to **precisely change an organism's DNA**.
- These technologies **enable the addition, removal, or alteration of genetic material** at specific locations within the genome.
- The primary goal of genome engineering is to alter an organism's genetic code to prevent detrimental health effects that can arise from changes in nucleotide arrangement.
- Gene editing can occur at the **DNA, RNA, or epigenetic level**.

Gene Editing Methods and Tools

- **Restriction Enzymes** (The Original Genome Editor): These enzymes recognise and cut specific nucleotide sequences, allowing new DNA sequences to be introduced at these cut sites. A limitation of restriction enzymes is that they can only cut at specific, predetermined sites, which restricts their usability based on the desired cut location.
- **Zinc Finger Nucleases (ZFNs):** ZFNs addressed precision genome editing by comprising a nuclease domain and a specific zinc finger DNA-binding domain that recognises 3-base pair sites on DNA. Multiple ZFNs can be combined to recognise longer sequences, increasing specificity and making them "customizable" to a target of interest. ZFNs also proved beneficial for genome editing in plants.
- **TALENs (Transcription Activator-Like Effector Nucleases):** While similar in being composed of a nuclease fused to

DNA-binding domain sequences, TALENs recognise single nucleotides, providing an advantage over ZFNs' reliance on 3-base pair sites. However, the design and execution process for ZFNs was incredibly time-consuming and difficult.

- **CRISPR-Cas9:** CRISPR (Clustered Regularly Interspaced Short Palindromic Repeats) technology relies on guide RNAs to recognise the target site and the endonuclease Cas9 to make the cut, facilitating repair mechanisms. The technique has high specificity, low off-target effects, and ease of use, making it an attractive alternative to older methods like TALENs.

Applications of Gene Editing

- **Medicine:** Gene editing offers transformative potential in healthcare, aiming to prevent, study, and treat diseases.
 - **Drug Discovery:** It accelerates the process of identifying and validating drug targets, enabling scientists to screen a large number of targets and understand genes involved in disease progression or drug sensitivity. CRISPR-Cas9, for example, is being used in cancer immunotherapy trials.
 - **Therapeutics:** Gene editing is "tailor-made" for treating genetic diseases by correcting errors or typos in the genetic code that lead to loss of protein function. This includes inherited disorders and those driven by mutational load, like cancer.
 - **Diagnostics:** Due to its targeted nature, CRISPR serves as a powerful diagnostic tool for detecting infectious and non-infectious diseases.
- **Agriculture:** Gene editing can yield beneficial results for the food supply by addressing issues in food safety and availability.
 - **Livestock Improvement:** Scientists are using genome-engineered cattle and salmon to foster disease resistance, increase sustainability, and improve their nutritional and therapeutic value.
 - **Crop Enhancement:** Genome editing principles, particularly CRISPR, are being applied to crops like wheat, rice, and coffee to address issues such as food intolerance and spoilage. For instance, CRISPR-Cas9 is used to improve the immunogenicity of wheat, which is a main cause of celiac disease.
- **Biofuels and Environment:** Gene editing is helping scientists protect the environment by aiding biofuel research. Specific genetic manipulation of microbes using CRISPR is being used to improve their tolerance to biofuels, which is a limiting factor in economically friendly fuel production.

Ethical Concerns Associated with Gene Editing

- **Safety**
 - A primary concern is the possibility of off-target effects (edits in unintended places) and mosaicism (when some cells carry the edit while others do not).
 - Researchers and ethicists generally agree that human

germline genome editing for reproductive purposes should not be attempted at this time until it is deemed safe through research. The potential risks are not currently justified by the potential benefits.

- **Slippery Slope and Enhancement Concerns:** There is a concern that any genome editing, even for therapeutic uses, could lead to its use for non-therapeutic and enhancement purposes, which many view as controversial.
- **Informed Consent:** It is seemingly impossible to obtain informed consent for germline therapy because the affected patients are the embryo and future generations.
- **Justice and Equity**
 - As with many new technologies, there is concern that genome editing will only be accessible to the wealthy, thereby increasing existing disparities in healthcare access.
 - Taken to its extreme, germline editing could potentially create classes of individuals defined by the quality of their engineered genome.
- **Genome-Editing Research Involving Embryos:** Many people hold moral and religious objections to the use of human embryos for research.

Conclusion

India's first gene-edited sheep marks a milestone in biotechnology, with implications beyond agriculture—spanning healthcare, environment, and research. Ensuring ethical use, regulation, and equitable access will be key to realising its full potential.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. What are the broader implications of India's gene-editing advancements for its agricultural future? [150 words] [10 marks]

AXIOM-4 MISSION

Why in News: Just days after anticipation built around Indian astronaut Shubhanshu Shukla's Axiom-4 mission, the launch was delayed once again following the discovery of a leak in SpaceX's Falcon-9 rocket.

Key Details

- The Axiom-4 mission was scheduled to carry Shubhanshu Shukla and three others to the International Space Station on Tuesday, June 10, but a leak in the aircraft has postponed the launch.
- **ISRO Chairman** confirmed that a **liquid oxygen leak** was detected in the propulsion bay during a seven-second hot test conducted on the launch pad.
- The **new launch date of the Axiom-4 mission has not been declared yet** but it could be some time until the

astronauts begin their launch to space. Once the leak is fixed, necessary validation tests would be conducted before the aircraft is cleared for the launch.

About the Axiom-4 mission

- This marks NASA's fourth fully private astronaut mission to the International Space Station.
- The mission is a joint effort between Axiom Space (a private company), NASA, the Indian Space Research Organisation (ISRO), and the European Space Agency (ESA).
- During their 14-day stay on the International Space Station, the crew will carry out microgravity experiments, test new technologies, and participate in outreach activities.
- The crew comprises individuals from the USA, India, Poland, and Hungary. Commander Peggy Whitson, pilot Shubhanshu Shukla and specialists Tigor Kapu of Hungary and Slawosz Uznanski-Wisniewski of Poland were slated to embark on the Axiom-4 mission.
- Shubhanshu Shukla is set to become the second Indian national to travel to space since 1984.
- The last Indian in space was Rakesh Sharma, who flew aboard the Soviet Union's Soyuz spacecraft in 1984.

International Space Station (ISS)

- The International Space Station (ISS), launched on November 20, 1998, is the largest artificial structure in space and functions as a living and working space for astronauts. It has been continuously occupied since 2011.
- The ISS is a joint venture among the space agencies of the United States (NASA), Russia (Roscosmos), Europe (ESA), Japan (JAXA), and Canada (CSA).
- The ISS aims to enhance our understanding of space and the effects of microgravity, while also fostering global scientific collaboration and innovation.
- The station orbits Earth at an altitude of approximately 400 kilometers.
- It moves at a velocity of around 28,000 kilometers per hour, completing one full orbit every 90 minutes.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements:

1. The Axiom-4 mission, involving agencies such as NASA, JAXA, and ESA, was postponed due to a hydrogen leak in SpaceX's Falcon-9 rocket.
2. The International Space Station (ISS), a collaborative project involving six international space agencies, has been continuously inhabited since its launch in 1998.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

(p) Answer

BREAKTHROUGH PRIZE IN FUNDAMENTAL PHYSICS

Why in News: India Celebrates Breakthrough Prize in Fundamental Physics Awarded to Large Hadron Collider Experiments

Key Details

- The 2025 Breakthrough Prize in Fundamental Physics is awarded to co-authors of publications based on CERN's Large Hadron Collider Run-2 data released between 2015 and July 15, 2024, at the experimental collaborations ATLAS, CMS, ALICE and LHCb.
- This prestigious award honours the collaborative and transformative research efforts that deepened our understanding of the Higgs boson, the quark-gluon plasma, matter-antimatter asymmetry, and physics beyond the Standard Model.
- Scientific teams belonging to several institutes from across the world have been working in a collaborative manner to achieve the objectives of the CERN experiments.
- India, a committed and active partner in the LHC program, proudly acknowledges this international recognition and celebrates its significant contributions to the experiments and the LHC infrastructure.

Large Hadron Collider

- Operated by CERN, the Large Hadron Collider is the world's most powerful particle accelerator, enabling high-energy proton and heavy-ion collisions to explore the structure of matter at the smallest scales.
- It enables high-energy proton and heavy-ion collisions to probe the structure of matter.

CERN (European Organization for Nuclear Research)

- CERN was founded in 1954 and based in Geneva, Switzerland, this organization is one of the world's foremost centres for research in particle physics.
- With 23 European countries as its members, its mission is to understand the fundamental structure of the universe by studying particles, the building blocks of matter.
- India is an associate member.

India and CERN

- India's involvement with CERN dates back to the 1960s, when scientists from the Tata Institute of Fundamental Research (TIFR) visited CERN to expose emulsion stacks

to pion, kaon and proton beams utilizing the CERN Proton Synchrotron.

- In the 1990s, the collaboration expanded into heavy ion physics, with **Indian groups contributing a scintillator-pad-based photon multiplicity detector**. Indian teams played key roles in the **WA93 and WA98 experiments at CERN-SPS**, achieving early measurements of collective flow and exploring disoriented chiral condensates.
- **In 1991, India (DAE) signed a cooperation agreement with CERN** for development of Scientific and Technical Cooperation in the Research Projects of CERN, with a formal cooperation agreement signed in 1991.
 - This was further strengthened by a **Memorandum of Understanding (MOU) signed in 2009**, laying the groundwork for expanded collaboration in accelerator technology, detector R&D, computing infrastructure, and human resource training
- In recognition of the significant Indian contributions towards the LHC project, India was awarded the "Observer" status in 2002 and finally, India became an **Associate Member State of CERN in 2017**.

As a testament to the long-standing scientific collaboration between India and CERN, in June 2004, **India gifted a 2m tall statue of the Indian deity Shiva Nataraja**, the Lord of Dance to CERN. In choosing the image of Shiva Nataraja, the Indian government acknowledged the profound significance of the metaphor of Shiva's dance, drawn by Carl Sagan for the cosmic dance of subatomic particles, which is observed and analysed by CERN's physicists.

What are the Breakthrough Prizes?

- The awards **were established in 2013** by Mark Zuckerberg and his wife Priscilla Chan, former Google chief Sergey Brin, genomics company 23&Me founder Anne Wojcicki, and tech investor couple Yuri and Julia Milner.
- They are also referred to as the "**Oscars of Science**," these prizes recognize outstanding achievements in fundamental physics, life sciences, and mathematics.
- As part of its mission, the prize **celebrates individual achievements and honours scientists as the heroes of society**, aims to inspire the next generation of scientists, and pursues "science for the benefit of all as a global, apolitical organization."

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

- Q. With reference to India's collaboration with CERN, consider the following statements:
1. India became an Associate Member State of CERN in 2017, after holding Observer status since 2002.
 2. In 1991, India (DAE) signed a cooperation agreement with CERN for development of Scientific and

Technical Cooperation in the Research Projects of CERN, with a formal cooperation agreement signed in 1991.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (c)

KARLSRUHE TRITIUM NEUTRINO EXPERIMENT AND NEUTRINO MASS

Why in News: The Karlsruhe Tritium Neutrino Experiment closely observed the disintegration of molecular tritium to estimate the neutrino mass.

About the Experiment

- The collaboration said that this sum **couldn't exceed 8.8 x 10-7 times the heft of the electron**, a 2x improvement on the previous best constraint.
- The KATRIN experiment is designed **to determine the mass of the neutrino**, which is considered the hardest-to-detect subatomic particle in the universe.
- KATRIN uses a massive detector in an attempt to measure the mass of the neutrino.
- The experiment closely observes the **disintegration of molecular tritium to estimate the neutrino mass**.
- Specifically, it focuses on the maximum energies of electrons emitted when tritium decays, as these energies carry information about the neutrino's mass.
- To set the latest constraint, KATRIN collected data from no fewer than 36 million electrons.

Neutrino

- A neutrino is a fundamental particle, meaning it is **not known to be made of any smaller pieces**.
- It is a member of the same group of fundamental particles as the electron. However, unlike electrons, **neutrinos have no electric charge**.
- **Characteristics and Mysteries**
 - **Interaction with Matter:** Neutrinos are often referred to as **ghostly particles** because they almost never interact with other matter. They **interact only through gravity and the weak force**, which is significant only at very short distances.
 - **Mass and Oscillation:** While scientists initially thought neutrinos were massless, it has been established that at least two of the three types of neutrinos have more than zero mass.
 - There are three types of neutrinos that scientists

have discovered so far, named for the other matter particles they interact with: the **electron neutrino, muon neutrino, and tau neutrino.**

- **Sources of Neutrinos**
 - Nuclear reactors
 - Radioactive decay
 - Particle accelerators
 - The Sun
 - The Earth
 - Cosmos
 - Beta decay

Key Experiments and Research Related to Neutrinos

- **KATRIN Experiment:** Aims to directly measure the neutrino mass.
- **PROSPECT:** This experiment uses neutrinos from reactors to search for unknown types of neutrinos beyond the three already discovered.
- **Fermilab Short-Baseline Neutrino program:** This program uses neutrinos from accelerators to search for unknown types of neutrinos.
- **MAJORANA Demonstrator Experiment:** Located deep under the Earth’s surface, this experiment is designed to determine whether neutrinos are their own antiparticles.
- **NOvA and the Deep Underground Neutrino Experiment (DUNE):** These experiments study the phenomenon of neutrino oscillation, which examines how mass differs between various types of neutrinos.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Neutrinos:

1. Neutrinos are electrically neutral and nearly massless subatomic particles.
2. They interact strongly with matter, making them easy to detect.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

Answer: (a)

BATTERY ENERGY STORAGE SYSTEM (BESS)

Why in News: On World Environment Day 2025, The Hindu published an article titled “Role of BESS in shaping India’s Energy Transition”, highlighting the growing importance of

Battery Energy Storage Systems (BESS) for their affordability, scalability, rapid deployment, and geographical flexibility.

Battery Energy Storage System (BESS)

- A Battery Energy Storage System (BESS) is a **large-scale rechargeable battery** that plays a crucial role in the energy landscape.
- It **stores electricity, often from renewable sources** like the sun and wind, when it is abundant. BESS can become a vital component in the energy landscape as demand for renewable energy and electrification grows.

Types of Battery Energy Storage System (BESS)

- **Portable Power Units:** Designed for flexibility and transient settings, offering a seamless charging experience. These units deliver consistent power, integrate easily with current asset and fleet management services, connect quickly to the grid, and offer high energy density in a compact and cost-effective form.
- **Stationary Power Units:** Optimise commercial and industrial sites with a cost-effective and environmentally responsible energy solution.

Benefits

- **Emission Reduction:** Helps reduce emissions and promotes a greener grid by decreasing reliance on non-renewable sources.
- **Cost Optimisation:** Stores energy when electricity prices are low (e.g., at night or during high renewable generation) and uses it during peak hours when prices are high, potentially reducing energy bills.
- **Reliable Power Source:** Provides a steady and reliable source of backup power during outages or disruptions, ensuring consistent operations even if renewable sources are intermittent.
- **Grid Stability:** Enhances grid operations by stabilising the grid, balancing demand-supply fluctuations, and enabling peak load management.
- **Revenue Generation:** Offers the opportunity to participate in the energy market by selling surplus energy back to the grid during peak hours, transforming excess energy into revenue.
- **Integration with Renewables:** Mitigates the variability of renewable energy, enabling their large-scale integration into power systems.
- **Decentralised Solutions:** Supports decentralised energy solutions and microgrids, ensuring renewable energy reaches where it is needed most.

Need for BESS in India

- **Integrating Renewables:** The increasing capacity of renewable energy, while crucial for lower emissions and affordable power, is hindered by its intermittent nature. BESS offers a critical solution to mitigate this variability and enhance grid stability, enabling large-scale integration of renewables.

- **Energy Transition:** BESS is vital for the energy transition by enhancing grid operations and providing reliable power. It stands out among energy storage technologies due to its affordability, scalability, rapid deployment, and geographical flexibility.
- **Emissions Reduction & SDG 7:** Integrating BESS with renewables can considerably reduce greenhouse gas emissions from the power sector, aligning with Sustainable Development Goal 7 for access to clean energy.
- **Achieving National Targets:** India has set an ambitious target of 500 GW of installed power capacity from non-conventional fuels by 2030. As of January 2025, 217.62 GW has been achieved. To fully realise these results, BESS deployment must be accelerated. The full potential of renewable energy cannot be achieved without energy storage, making BESS essential for India to become energy secure.

Challenges Faced by India

- **Regulatory, Technical, Financial, and Market Barriers:** These impede the full utilisation of BESS potential.
- **Investment for Grid Upgradation:** A lack of investment in upgrading grid infrastructure is a significant challenge.
- **Speed of BESS Deployment:** The pace of BESS deployment by large customers needs to increase.
- **Access to Critical Minerals:** Difficulty in accessing critical minerals required for the indigenisation of storage technology is a hurdle.
- **Delays in Large-scale BESS Agreements:** Delays in finalising agreements for large-scale BESS projects are observed.
- **Procurement Challenges:** The Economic Survey 2024-25 specifically called for focusing on innovation and investment to resolve challenges in procuring battery storage.

Way Forward

- **Innovative Partnerships:** Leveraging alliances between public, private, and philanthropic entities can provide concessional funding and technical assistance.
- **Facilitating Initiatives:** Encouraging more such collaborative initiatives is key to increasing BESS deployment, fulfilling SDG 7 commitments, enhancing energy security, and improving grid stability.
- **Comprehensive Approach:** India needs to focus on expeditious large-scale BESS projects for central and State grids, secure concessional financing, provide technological aid, promote manufacturing localisation, and explore recycling opportunities to utilise BESS to its fullest extent.
- **International Collaboration:** As a member of the BESS consortium, founded by GEAPP, India is focusing on deploying energy storage to ensure that any increase in renewable energy power capacity can be utilised to its full potential. More alliances can help India emerge as

an energy-secure nation with flexible grids and increased renewable deployment.

Government Initiatives

- **BESS Deployment Target:** The government has committed to installing 47 GW of BESS by 2032 to enable increased renewable deployment and its integration with the grid.
- **Financial Support Schemes**
 - Viability Gap Funding (VGF) for BESS projects.
 - Waiver of interstate transmission system charges for BESS projects commissioned by June 2025.

Conclusion

Battery Energy Storage Systems (BESS) are **key to India's energy transition** by enabling renewable integration and grid stability. However, challenges like limited grid infrastructure investment and critical mineral access. A coordinated strategy with partnerships, financing, and technology support is crucial to accelerate deployment and establish India as a sustainable energy leader.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. What role do Battery Energy Storage Systems play in modern energy security? What are the primary challenges and opportunities for BESS deployment in India? [250 words] [15 marks]

WORLD'S FIRST FUSION-FISSION HYBRID REACTOR

Why in News: Recently, China has announced the construction of Xinghuo, the world's first hybrid fusion-fission nuclear plant.

Key Details

- China recently announced its ground-breaking plan to build **Xinghuo**, which translates to "spark" in Mandarin, **the first hybrid fusion-fission nuclear power plant in history.**
- This invention represents a major advancement in the field of energy production and has the **potential to spark a technological revolution** with broad geopolitical and economic ramifications.
- By **combining both fusion and fission reactions**, Xinghuo's hybrid nature promises to **maximise energy output while minimising radioactive waste**, establishing a new standard for nuclear power sustainability and efficiency.

The Science Behind Fusion-Fission Hybrid Reactor

- **Fission**, a process that **releases energy by splitting heavy atomic nuclei like uranium**, is at the heart of modern nuclear power technology.

- Our sun, on the other hand, is powered by **fusion**, a reaction in which two lighter atomic nuclei unite to form a heavier nucleus while releasing a tremendous amount of energy.
 - Fusion is a very efficient energy source because it can theoretically produce four times as much energy per kilogramme of fuel as fission.
- The Xinghuo plant's capacity to combine these two reactions makes it special.
- The **high-energy neutrons produced by the fusion process are used to initiate fission in surrounding materials**, creating a self-sustaining cycle that maximizes energy production.
- This cleverly designed **dual-stage reactor system** has the potential to completely transform the way we use nuclear energy by making the most of each particle

Key features

- **Capitalises on the differences between the benefits of fusion and fission:** Whereas fission reactors are "neutron poor" and "power rich," fusion reactors are "neutron rich" and "power poor."
- **Fuel Supply:** By breeding, a hybrid reactor would generate enough fissile fuel. Fertile materials can be transformed into fissile materials (such as uranium-233 or plutonium-239) by fusion neutrons, expanding the supply of fuel.
- **Low Power Requirements:** Because the primary function of hybrid reactors is the production of neutrons rather than energy, they require less fusion power than pure reactors.
- **Decreased Radioactive Wastes:** The blanket's neutron flux has the **potential to convert** long-lived radioactive waste into shorter-lived, less hazardous, and simpler-to-dispose wastes.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Recently, the term 'Xinghuo' was in the news. What does it refer to?

- World's first hybrid fusion-fission nuclear plant
- A new AI supercomputer developed by Japan
- A joint India-China project on Thorium based energy
- None of the above

Answer: (a)

BHARATGEN

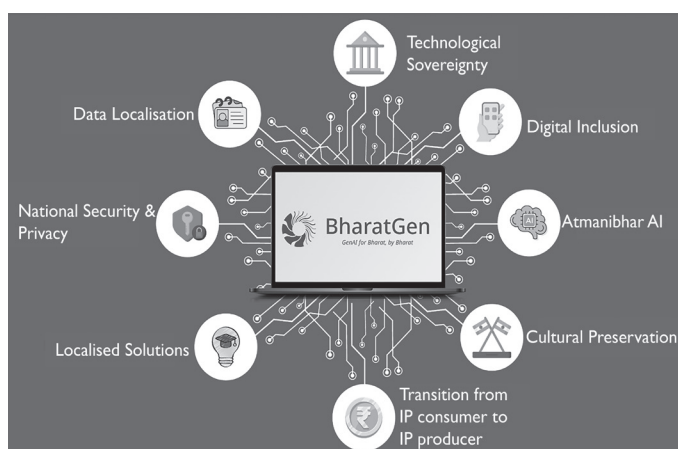
Why in News: Union Minister Dr. Jitendra Singh launches 'Bharat Gen' - India's first of its kind Indigenously developed government funded AI based Multimodal LLM for Indian Languages at BharatGen Summit.

Key Details

- Developed under the **National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS)** and implemented through TIH Foundation for IoT and IoE at IIT Bombay, BharatGen aims to revolutionize AI development across India's linguistic and cultural spectrum.
- The initiative is supported by the **Department of Science and Technology (DST)** and brings together a robust consortium of leading academic institutions, experts, and innovators.
- This initiative will empower critical sectors such as healthcare, education, agriculture, and governance, delivering region-specific AI solutions that understand and serve every Indian.

About BharatGen

- It is the **first Multimodal Large Language Model (LLM) in India** that has been developed indigenously with government support and covers **22 Indian languages**.
- **Objectives:** To advance ethical, inclusive, and multilingual AI aligned with Indian cultural values; deliver localized solutions in sectors like healthcare, agriculture, education, and governance; and enhance rural telemedicine through AI-powered doctors communicating in local languages.
- The BharatGen initiative is being implemented through a **network of 25 Technology Innovation Hubs (TIHs)**, with four of them elevated to the status of Technology Translational Research Parks (TTRPs).
- The mission is built on **four key pillars:** technological advancement, promotion of entrepreneurship, skill and human resource development, and promoting international partnerships.



What are Multimodal Large Language Models?

- A model is considered multimodal if **it can handle and integrate information from different modalities**. For instance, an MLLM can interpret a text description, analyze a corresponding image, and generate a response that encompasses both forms of input.
- This capability allows MLLMs to perform tasks that require a nuanced understanding of various types of data, making them more versatile and powerful.

Key Components of Multimodal Large Language Models



EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the Bharat-Gen initiative:

1. Bharat-Gen is India's first government-supported, indigenously developed Multimodal Large Language Model (LLM) covering 22 Indian languages.
2. The Bharat-Gen initiative is being implemented through a network of 25 Technology Innovation Hubs (TIHs), four of which have been upgraded to Technology Translational Research Parks (TTRPs).

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
 (c) Both 1 and 2 (d) Neither 1 nor 2

Answer: (c)

QUANTUM KEY DISTRIBUTION

Why in News: Recently, DRDO & IIT Delhi demonstrated Quantum Entanglement-Based Free-Space Quantum Secure Communication over more than 1 km distance.

Key Details

- The experiment achieved a **quantum bit error rate of less than 7%** and a **secure key rate of almost 240 bits per second**.
- This entanglement-assisted quantum secure communication **opens the door to real-time quantum cyber security applications, such as the future quantum internet, long-distance Quantum Key Distribution (QKD), and the creation of quantum networks**.
- India's larger goals to develop quantum technologies for the country's development are in line with these initiatives.
- The **first intercity quantum communication link between Vindhyachal and Prayagraj** in India was previously demonstrated by DRDO in 2022 using commercial-grade underground dark optical fibre.
- More recently, in 2024, the team used entanglement to successfully distribute quantum keys across a 100 km telecom-grade optical fibre spool in another project supported by DRDO.

What is Quantum Computing?

Quantum computers use special units called qubits to store and process information. Unlike regular computers, where **bits can only be 0 or 1**, qubits can be both 0 and 1 at the same time. This ability to be in multiple states at once makes quantum computers different and potentially much more powerful than traditional ones.

Quantum Key Distribution (QKD)

- Quantum Key Distribution is primarily a **secure communication technique** that employs cryptographic protocols based on the **principle of Quantum Mechanics** to enable the exchange of encryption keys with high security.
- By improving security and functionality, quantum entanglement-based QKD provides a number of noteworthy benefits over the conventional prepare-and-measure approach.
- The use of **quantum entanglement guarantees** the security of key distribution even in the case of compromised or flawed devices.
 - Quantum entanglement is a phenomenon in which two subatomic particles become deeply interconnected, such that the state of one particle instantly influences the state of the other—regardless of the distance separating them—causing them to behave as a single, unified system.

NORTH-EAST INSURGENCY

Why in News: Recently, security forces launched an anti-insurgency operation along the India-Myanmar border in Arunachal Pradesh.

About North East India

- Northeast India, often referred to as the “**land of seven sisters**,” serves as both a geographical and administrative region of the country.
- This area is characterized by diverse **physiographic features and ecological climates**, acting as a natural gateway for India’s unique flora and fauna.
- The **Sixth Schedule of the Indian Constitution, under Article 244**, provides for the governance of tribal areas in the northeastern states of Assam, Meghalaya, Tripura, and Mizoram.
- This region accounts for **approximately 3.8% of India’s population and spans around 8% of the country’s total land area**. It is linked to the Indian mainland through the Siliguri Corridor in West Bengal, a narrow land strip commonly known as the “chicken’s neck.”

Internal Security Concerns in the Northeastern Region

- **Refugee inflow:** Political unrest in Myanmar, particularly following the military takeover in 2021, resulted in a flood of refugees, particularly ethnic Chins and Rohingyas, which put a strain on resources and fuelled local animosity.
- **Insurgent activities:** Myanmar has served as a safe haven for a number of insurgent organisations, including National Socialist Council of Nagaland – Khaplang (NSCN-K), United Liberation Front of Assam-Independent (ULFA-I), People’s Liberation Army (PLA), and National Democratic Front of Bodoland (NDFB), to train, reorganise, and launch attacks against Indian security forces.
- **Drug trafficking:** The Golden Triangle (Myanmar, Laos, and Thailand) is a major source of heroin and synthetic drugs. These drugs enter the North-Eastern states through Myanmar, which exacerbates the problem of drug abuse.
- **Human Trafficking:** Human trafficking is rising in the area, and victims are frequently used for sex work or forced labour.
- **Arms Smuggling:** Rebel groups frequently obtain their weapons from countries on the other side of the border, making illegal arms smuggling a recurring problem.

- **Wildlife Trafficking:** Illegal wildlife trade also crosses the border, endangering biodiversity.

Causes behind the survival of anti-insurgency in India

- **Ethnic Diversity:** The region’s rich ethnic diversity has often led to identity-based conflicts. Various ethnic groups’ demands for autonomy or separate statehood have served as fuel for insurgencies.
- **Geographical Isolation:** The region is geographically isolated from the rest of India, and its difficult terrain and international borders have made control and administration challenging.
- **Economic Backwardness:** Due to a lack of economic growth and development, the area has been marginalised, which has caused dissatisfaction and fostered an atmosphere that is favourable to insurgencies.
- **Inadequate Law and Order Machinery:** Insurgents have frequently been able to avoid police action due to inadequate policing and improper surveillance.
- **Cross-border Support:** According to reports, some insurgent groups have been able to continue their operations by receiving weapons, shelter, and training from China and Myanmar.
- Way Forward
- **Military action:** Counter-insurgency operations to destroy cross-border insurgent camps as well as conducting active operations to stop drug smuggling and human trafficking.
- **Legal and policy measures:** Elimination of the Free Movement Regime in Myanmar and the implementation of the National Register of Citizens (NRC) in Assam to identify unauthorised migrants.
- **Border Infrastructure:** Fortification of border outposts, smart fencing under the Comprehensive Integrated Border Management System (CIBMS), etc. Enhancing border security to prevent money laundering, arms trafficking, and infiltration.
- **Role of Civil Society:** Despite the advancements in peace negotiations, civil society’s attempts to improve relations with insurgent groups must go on.
- **Internal boundary of states:** States’ borders should be clearly marked in order to prevent disputes between their various ethnic groups and maintain internal harmony.

Conclusion

An all-encompassing approach is required to address these issues, which include **political discourse, economic development, and environmental sustainability**. A three-pronged strategy of development, dialogue, and defence is essential to the peace and security of the Northeast Region.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the internal and external dimensions of the insurgency problem in India's North-Eastern region. Suggest a multi-pronged strategy to address it. [150 Words] [10 Marks]

WOMEN IN ARMED FORCES

Why in News: Recently, the first-ever batch of 17 female cadets passed out from NDA after completing the 148th course - Spring term 2025.

Key Details

- The event concluded with a grand flypast featuring flag-trooping **Chetak helicopters, Super Dimona motorised gliders, and the majestic Sukhoi-30 fighter aircraft**, symbolising the culmination of training and the cadets' readiness to embark on the next phase of their military journey.
- The Spring Term 2025 POP stands as a proud testament to the Academy's enduring commitment to grooming future military leaders, now enriched with the inclusion of women cadets destined to serve the nation with honour and valour.
- The **event held historical significance** as it marked the passing out of the first-ever batch of 17 Female Cadets from the Academy — a transformative milestone in NDA's legacy of nation-building.

Significance of Women in Armed Forces

- Diversity:** Women's involvement in the army enhances leadership and strategy by bringing a variety of viewpoints to the table.
- Gender equality:** In accordance with the principles outlined in Articles 14, 15, and 16 of the Constitution, the inclusion of women in the army fosters gender equality in society and makes it more inclusive.
- Talent Pool and Recruitment:** Women are capable of handling weapons effectively in the era of cyberwarfare and digitally equipped weapons.
- Inspiration:** Other young women find inspiration in the successful female soldiers.
- National Security:** Increasing the use of human resources helps in strengthening national security.
- Defence Forces' humanitarian role:** Where social norms restrict the role of male soldiers, women can engage with local populations. For instance, military civic engagement initiatives.

Challenges

- Physical Stress:** Due to biological differences and current training regimens, combat roles frequently call for high levels of physical strength and endurance, which can be difficult to achieve.
- Work-Life Balance:** Women's options for career continuity and deployment may be impacted by issues pertaining to marriage, pregnancy, and child care.
- Stereotypes:** It undermines the authority, morale, and professional advancement of female officers, particularly those in leadership positions, which can result from cultural and societal bias.
- Limited Opportunities for Combat Roles:** Women are still not allowed to serve in infantry, armoured corps, or special forces in the Army, despite the 2020 Supreme Court decision that granted them Permanent Commission.
- Infrastructure and Facilities:** Limited access to gender-sensitive health care and counseling, coupled with inadequate separate accommodation, sanitation, and hygiene facilities in some units, especially in field or remote postings.

Way Forward

- Policy changes:** Make sure women have equal access to high-level positions and permanent commissions.
- Structural reforms:** Encourage gender-sensitive practices in military facilities, including maternity leave and segregation.
- International Best Practices:** A mixed-gender battalion model is used by the Israel Defence Forces (IDF), with roles being assigned according to individual capability. Taking into account its distinct socio-cultural and strategic context, India should adopt these models with modification.
- Work-life balance:** Regular counselling sessions and childcare facilities can help women employees maintain a healthy work-life balance.
- Awareness and training:** To dispel gender stereotypes in the military and society at large, implement training initiatives and awareness campaigns.

Conclusion

Women's inclusion in the armed forces **strengthens national security, promotes equality, and reflects a modern, progressive defence outlook**. With supportive reforms, their role can be further expanded and empowered.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the significance of inducting women into the armed forces. What challenges hinder their full integration, and what reforms are necessary to ensure gender parity in defence services? [150 Words] [10 Marks]

INTEGRATED THEATRE COMMANDS (ITC)

Why in News: India has notified crucial rules under the Inter-Services Organisations (Command, Control and Discipline) Act, 2023, empowering commanders of tri-service organisations—and future theatre commands—with full authority over personnel from the Army, Navy, and Air Force serving under them.

Theatre Commands

- Theatre commands represent a departure from the existing fragmented structure, where the Army, Navy, and Air Force largely operate independently within their own commands. Instead, **units from all three services will operate together under a single theatre commander** for specific geographical or functional areas.
- **Aim:** The primary goal is **to improve operational efficiency, reduce duplication, and rationalise resources.** This approach seeks to strengthen jointness, command efficiency, and overall operational synergy among the armed forces.
- **Current Structure:** India currently has 19 commands across its three services: seven each for the Army and Air Force, and three for the Navy.
 - **Only two tri-service commands exist presently:** the Andaman and Nicobar Command and the Strategic Forces Command.
- **Proposed Reorganisation:** The plan is to reorganise and subsume several of these existing commands into three main proposed theatres:
 - **Western Theatre Command:** Expected to face Pakistan.
 - **Northern Theatre Command:** Expected to face China.
 - **Maritime Theatre Command:** Expected to cover the Indian Ocean region.
- **Proposed Headquarters:** Reports suggest the western theatre command may be headquartered in Jaipur, the northern theatre command in Lucknow, and the maritime command possibly in Coimbatore.

Legal Framework and Empowerment

- **Inter-Services Organisations (Command, Control and Discipline) Act, 2023 (ISO Act):** The Government has taken a crucial step towards implementation by notifying rules under this Act.
- **Empowerment of Commanders:** These rules, which became effective from May 10, 2024, grant military commanders of tri-service organisations and future theatre commands full administrative and disciplinary powers over personnel from the Army, Navy, and Air Force serving under their joint commands.
- **Legal Clarity:** The ISO Act replaces parts of the Army Act, Navy Act, and Air Force Act as they pertain to ISOs, establishing a clear legal framework for joint military operations.

- **Impact:** This step aims to bolster effective command, control, and efficient functioning of ISOs, strengthening jointness among the armed forces. It also enables the expeditious disposal of disciplinary cases and helps avoid duplication of proceedings.

Leadership Structure and Roles

- **Chief of Defence Staff (CDS):** The creation of the CDS post and the Department of Military Affairs (DMA) were early steps towards integrating the military services. The CDS is mandated to ensure “jointness” across various functions like operations, logistics, training, and support services.
- **Division of Responsibility:** Under the proposed structure, there will be two parallel and complementary streams:
 - **Theatre Commanders:** These commanders will be responsible for “Force Application” or the operational aspects of warfare.
 - ◆ They are envisioned as three-star officers, with a strong recommendation for them, along with the Vice CDS, to be four-star officers.
 - **Service Chiefs:** In their transformed role, the Service Chiefs will be responsible for “Raise, Train and Sustain (RTS)” functions, which is colloquially termed “Force Generation”.
- **Reporting Structure:** The three theatre commanders are likely to report to a National Defence Committee, which would probably be headed by the Defence Minister.
- **Additional Posts:** The creation of additional posts, such as Vice CDS and Deputy CDS, is being considered to oversee strategic planning, procurement, operations, and intelligence.

Strategic Need and Benefits

- **Evolving Threats:** India’s northern and western borders present complex and evolving threats. Future conflicts are anticipated to involve all dimensions of warfare, including cyber operations.
- **Unified Warfighting:** Theatre commands offer a mechanism to integrate resources for a unified, efficient warfighting approach. This is crucial as more than five military commands might need to cooperate in any future conflict.
- **Rationalisation:** The planned theatre commands will also rationalise logistics and infrastructure, thereby eliminating redundancies and improving operational coherence.
- **Overall Goal:** These reforms are deemed “necessary to strengthen the armed forces in view of the global security scenario”, promising to transform India’s defence forces into a more agile and coordinated fighting force.

Challenges and Progress towards Integration

- **Implementation Delays:** Despite the clear strategic benefits, the implementation of theatre commands has

been slow. This was due to a lack of consensus between the Services and a stall after the passing of the first CDS, Gen Bipin Rawat, and the delay in appointing his successor.

- **Institutional Resistance:** Differences remain between the services regarding the shape, scope, and control of theatre commands. For example, the Air Force initially resisted the idea of an Air Defence Command due to concerns about limited squadron strength and the division of air assets.
- **Cultural and Organisational Changes:** The structural transformation at the apex level will trigger conceptual and cultural changes, along with cascading organisational changes at lower levels, which will come with their own set of challenges.

Conclusion

Integrated Theatre Commands aim to **enhance jointness and operational efficiency** among India's armed forces. Despite implementation challenges, they are crucial for building a unified, agile, and modern military structure to address evolving security threats.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the significance of Integrated Theatre Commands in strengthening India's defence preparedness. What are the major challenges in implementing this reform, and how can they be addressed? [250 Words] [15 Marks]

RUDRASTRA UAV

Why in News: Recently, **Solar Defence and Aerospace Limited (SDAL)**, a Nagpur-based private defence firm, achieved a significant milestone by **successfully testing its hybrid UAV, Rudrastra**, at the **Pokharan Firing Range** in Rajasthan. **This marks a major step forward in India's journey towards self-reliance (Atmanirbharta) in defence technology.**

Key Features and Capabilities of Rudrastra

- **Hybrid VTOL Technology:** The VTOL capability means that the UAV can take off and land vertically, without requiring a runway. This makes it highly useful in **hilly and inaccessible terrains.**

Mission Radius & Range

- It has a **mission radius of over 50 km**, with a **total operational range exceeding 170 km**, including time spent loitering over the target area.
- **Endurance:** The UAV can stay airborne for **about 1.5 hours**, making it ideal for tactical surveillance and precision strikes.
- **Automated Return System:** Once the mission is completed, **Rudrastra can autonomously return** to its base station, ensuring **ease of operation and safety** even in complex missions.

Combat and Surveillance Role

- **Precision-Guided Munition:** Rudrastra is armed with anti-personnel airburst warheads, designed to explode at low altitudes for maximum impact across a wide radius.
 - **Targeting Deep into Enemy Territory:**
 - ◆ It is capable of striking **targets 50–100 km inside enemy lines**, especially **enemy artillery positions, terrorist hideouts, and infrastructure.**
 - **Live Video Relay:** Rudrastra can send back real-time video feeds, making it valuable for intelligence gathering, surveillance, and target confirmation.
 - **Multi-Use Platform:** Beyond combat roles, its design allows for mapping, supply delivery, and disaster monitoring, proving its operational versatility.

Why is Rudrastra Important?

India's armed forces are increasingly seeking **indigenous drone systems** to reduce dependency on foreign technology. Rudrastra meets key **tactical requirements**, especially in **cross-border operations**, providing:

- Situational awareness
- Precision strike capability
- Operational independence

It also aligns with the government's vision of **'Make in India'** in defence.

Strategic Significance

Both Rudrastra and Bhargavastra represent a **new phase in India's defence ecosystem**, where **private sector innovation, indigenous capability, and tactical needs** of the armed forces come together. They are not just tools of warfare but **symbols of technological sovereignty.**

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. What is Rudrastra, recently seen in the news?

- Short-Range Tactical Cruise Missile
- Long-Range Air Defence Missile
- Unmanned Aerial Vehicle
- Rocket Launcher

Answer: (c)

AMCA FIGHTER JET

Why in News: Recently, the **Defence Minister approved the execution model for the Advanced Medium Combat Aircraft** through industry tie-up.

Advanced Medium Combat Aircraft (AMCA): Key Features

- **Induction Timeline**
 - Targeted for induction into the Indian Air Force (IAF) by 2034.
- **Performance and Capabilities**
 - **Speed:** Supersonic; up to Mach 2.15
 - **Combat Range:** 1,620 km
 - **Engine Type:** Twin-engine configuration
- **Payload Capacity**
 - **External Payload:** Up to 5,500 kg
 - **Internal Payload:** Up to 1,500 kg

- **Multirole Combat Capabilities**
 - Air-to-Air Operations
 - Air-to-Ground Strikes
 - Electronic Warfare
- **Stealth Features**
 - Use of radar-absorbing materials
 - Specialised paint coatings to reduce radar reflectivity
 - Exhaust nozzles designed to lower infrared emissions
- **Combat Doctrine – “First Look, First Kill”**
 - Designed for early detection and engagement
 - Enables AMCA to spot and neutralize enemy aircraft before being detected or targeted

F-35
 Manufacturer: Lockheed Martin Corporation, USA
 Cost: \$80-110 million a piece
 Max Speed: Mach 1.6 (for all three variants)

- The world's best-known fifth generation fighter
- Hard to be detected by radar
- Carry advanced sensors to provide insights into potential targets
- Over 1,110 aircraft delivered to the customers so far
- 19 countries participate in the F-35 development programme
- Seven partner nations: UK, Italy, Netherlands, Canada, Australia, Denmark and Norway
- 12 foreign military sales partners: Israel, Japan, South Korea, Belgium, Poland, Singapore, Finland, Switzerland, Germany, Czech Republic, Greece and Romania
- Nearly 3,600 aircraft are to be manufactured for supplying to all countries
- USA would use over 2,400 of them
- Carry a wide range of missiles and bombs

Three Variants

- F-35A for Air Force**
 Conventional take-off and landing: Supports air to ground missions and comprises majority of partner aircraft and foreign military sales
- F-35B for Marine Corps**
 Short take off and vertical landing: Supports expeditionary basing ashore and deployment at sea
- F-35C for Carrier operations**
 Navy and Marine Corps variant with larger wingspan and greater fuel storage to support aircraft carrier operations and expeditionary missions

AMCA
 (Advanced Multirole Combat Aircraft)
 Manufacturer: Hindustan Aeronautics Limited, India
 Max Speed: 1.8 Mach

- Stealth airframe
- Advanced integrated avionics
- Integrated sensor suite
- Advanced sensors with data fusion
 - First prototype flight expected in three years

Su-57

Manufacturer: PJSC United Aircraft Corporation, Russia
 Cost: \$35-40 million a piece
 Max Speed: Mach 2

- Su-57E fifth-generation multifunctional fighter is designed for the execution of a wide range of combat tasks while operating against aerial, ground and surface targets
- Advanced intellectual support for the pilot and high level of automation
- Stealth actions due to low visibility level in the radar range, including operation of the avionics suite and application of weapons
- Long cruising flight in a supersonic mode
- Wide range of air weapons
- High noise immunity of the on-board avionics suite and armament complex
- First Russian aircraft with stealth technology
- First prototype flew in 2010
- First aircraft entered Service in Dec 2020
- Will replace the MIG-29 and Su-27 in the Russian Air Force
- Has real combat experience

5th Generation Fighters

- The most technologically advanced jets ever produced are fifth-generation fighters.
- **Twin-engine powered:** In the event of one engine failing, particularly at night, a twin-engine platform offers a higher degree of air safety and survivability.
- **Stealth:** Ability to use **Low-Probability-of-Interception (LPIR) radar** makes them more difficult for adversary radar to detect.
- **Supercruiser performance in agile airframes:** excellent manoeuvrability and the capacity to fly without afterburners at supersonic speeds.
- **Advanced avionics:** sophisticated electronic systems for targeting, communication, and control
- **Integrated Computer Systems:** With the help of integrated computer systems, pilots can network with other systems and see the entire battlefield without manoeuvring.

DARK PATTERNS

Why in News: The Central Consumer Protection Authority (CCPA) of India has recently asked over 50 digital platforms to remove dark patterns from their apps and websites. These platforms have also been directed to conduct a self-audit within three months to ensure their digital designs are fair and transparent for consumers.

What Are Dark Patterns?

In simple words, **dark patterns** are sneaky and misleading design techniques used on websites, apps, or digital platforms to trick people into doing things they didn't intend to do.

For example:

- Buying extra services without realising it.
- Subscribing to things unknowingly.
- Sharing personal information without full awareness.

These tricks cleverly use **psychological manipulation** and confusing layouts to influence user decisions. It's a misuse of technology and design to serve the platform's interests at the cost of user welfare.

Types of Dark Patterns and How They Manipulate You

- **False Urgency**
 - Creating a fake sense of hurry by telling you that time or stock is running out-making you panic and buy quickly.
 - **Example:** "Only 2 rooms left! 30 people are viewing this right now!" This forces you to decide fast, even if you don't need to.
- **Basket Sneaking**
 - Adding extra items or services to your cart at checkout without your clear permission.
 - **Example:** You book a flight ticket, and travel insurance gets added automatically without you noticing.
- **Confirm Shaming**
 - Using guilt or fear to push you into saying 'Yes' when you actually want to say 'No'.
 - **Example:** A message like "No thanks, I like wasting money" when you decline an offer for an extra service.

- **Forced Action**
 - Forcing you to do something unrelated to your intended activity.
 - **Example:** Forcing you to subscribe to a newsletter before you can buy a product.
 - **Subscription Trap**
 - Making it hard to cancel a subscription, or hiding the cancel option in complex menus.
 - **Example:** You start a 'free trial' but the cancellation process is so confusing that you end up paying unknowingly.
 - **Interface Interference**
 - Designing the website layout in a way that highlights certain information and hides other important details.
 - **Example:** Highlighting benefits of an expensive plan and keeping the basic one hidden or hard to find.
 - **Bait and Switch**
 - Promising one thing, but delivering something else.
 - **Example:** An online store shows a discounted product, but when you're ready to pay, it says the product is out of stock and offers a costly alternative.
 - **Drip Pricing**
 - Hiding extra charges until the last step of checkout.
 - **Example:** A flight ticket seems cheap initially but additional fees like baggage charges, seat selection, and taxes appear at the payment stage.
 - **Disguised Advertisement**
 - Making an ad look like normal content or news, fooling users into clicking it.
 - **Nagging**
 - Constantly bombarding users with unnecessary pop-ups, requests, or messages, disrupting the browsing experience.
 - **Example:** Repeatedly asking you to download an app or turn on notifications without giving a proper option to decline.
- How Do These Dark Patterns Exploit Consumers?**
- Dark patterns take advantage of our **psychological biases** - like fear of missing out (FOMO), confusion, guilt, and laziness.
 - They subtly guide us toward choices that benefit the platform or seller, even when those choices are against our own interests.

India's Legal Framework to Tackle Dark Patterns

- **Guidelines for Prevention and Regulation of Dark Patterns, 2023:** Issued by the CCPA under the Consumer Protection Act, 2019, these guidelines clearly define and prohibit dark patterns on digital platforms.
- **Consumer Protection Act, 2019:** Categorises dark patterns as “unfair trade practices” and empowers authorities to act against such deceptive practices.
- **Digital Personal Data Protection Act, 2023 (DPDPA):** Also complements these rules by focusing on **informed consent, transparency, and protecting user autonomy.**

Conclusion

Dark patterns are **invisible but dangerous tricks** that misuse digital design to mislead consumers. As more of our daily activities shift online, **it is essential to make people aware of these manipulative tactics.** India's new guidelines and laws aim to ensure fair, transparent, and consumer-friendly digital experiences. **Consumers should stay alert, read fine print carefully, and resist hasty decisions prompted by misleading online tactics.**

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. What are digital dark patterns? Discuss the different forms of dark patterns. How do digital dark patterns exploit users? [250 words] [15 marks]

INDIA NEEDS TO DESIGN AN INCLUSIVE PENSION SYSTEM

Why in News: Recently, an article appeared in The Hindu titled “India needs to design an inclusive pension system”, highlighting the need for a scalable and inclusive pension framework to ensure old-age financial security, especially for informal sector workers.

Pension Systems and Coverage Trends in India

- According to the **Economic Survey 2025–2026**, **pension assets in India only make up 17% of GDP**, while in many developed economies, they can reach 80%.
- Only about **12% of Indian workers are currently covered by official pension plans.**
- Workers in the public and organised private sectors are protected under numerous parallel programs, which results in disproportionate coverage.
- On the other hand, the National Pension System and Atal Pension Yojana **only provide voluntary adoption as protection for the unorganised sector.** In FY24, these two schemes **made up roughly 5.3% of the total population.**
- **Over half of the nation's GDP is produced by nearly**

85% of the unorganised labour force. The gig economy will continue to grow as markets change, so universal insurance is necessary.

Importance of Pensions in Ensuring Social and Economic Stability

- **Social Security and Elderly Dignity:** Pensions guarantee that people can sustain a minimal standard of living by providing financial support after retirement.
- **Stability of the Economy:** Regular pension payments serve as a reliable source of income, boosting demand in the economy and assisting household consumption.
- **Promotion of Official Employment:** Effective pension plans can entice employees to enter the formal economy, increasing tax revenue and enhancing adherence to labour laws.
- **The Role of the Welfare State:** The Directive Principles of State Policy (**Article 41 of the Indian Constitution**), which emphasise the state's obligation to provide public assistance in old age, are in line with the pension system.
- **Decrease in the Burden of Dependency Ratio:** Pensions ease the financial strain on younger family members by providing financial independence to the elderly, particularly in joint family arrangements.
- **Assistance in Times of Economic Volatility:** Pension payments can act as a lifeline during emergencies (like COVID-19), guaranteeing resilience and ongoing household consumption.

Challenges of the Pension System in India

- **Heavy Financial Pressure on Government:** Pension schemes funded entirely by the government, such as the Old Pension Scheme (OPS), place a significant load on state finances. As the number of retirees increases, a larger share of public funds is directed toward pension payments.
- **Low Inclusion of Informal Sector Workers:** A majority of India's workforce is engaged in informal jobs without access to any formal retirement benefits. Though schemes like the Atal Pension Yojana (APY) aim to address this, participation remains low due to irregular earnings and limited awareness among workers.
- **Pension Amounts Are Often Too Low:** Many government pensions, especially those given as part of social welfare programs, are too small to meet basic daily needs. As a result, retired individuals continue to struggle with poverty and lack of financial independence.
- **Gender-Based Disparities:** Women are often excluded from pension benefits because they are more likely to work in unpaid or informal roles. Additionally, shorter working careers and wage gaps mean they receive lower pensions even when eligible.
- **Low Public Awareness and Financial Literacy:** Many individuals are unaware of the pension schemes available to them or lack the financial literacy needed to join or contribute. This is especially true in rural areas and among lower-income groups.

Way Forward

- **Implementing a Minimum Guaranteed Pension Plan:** Maintaining a steady income for retirees, particularly in times of economic downturn.
- **Inclusion of Workers in the Informal Sector:** Adding employees who are not employed by the government to the pension pool.
- **Flexible Requirements for Tenure:** Accommodating career disruptions and late arrivals to the workforce while making pension plans.
- **Creating a Robust Regulatory Environment:** To supervise fund management and guarantee transparency, an independent Pension Regulatory Authority should be established.
- **Improving Financial Knowledge and Guidance:** Offering programs for financial literacy to assist people in making knowledgeable pension decisions

Conclusion

As India undergoes a demographic shift, a minimum pension guarantee and a well-structured pension system for everyone, including informal workers, will ensure basic financial security during retirement. Policymakers must act now to design a truly inclusive pension system for all, regardless of their occupational status.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Despite multiple schemes, India’s pension system remains fragmented and exclusionary, especially for informal sector workers. In the light of this statement, examine the key challenges facing India’s pension landscape and suggest measures to build an inclusive and sustainable pension system. [250 Words] [15 Marks]

INDIA’S SOCIAL PROTECTION SURGE

Why in News: According to the latest data from the International Labour Organization’s (ILO) ILOSTAT database, India’s social security coverage has increased from 19% in 2015 to 64.3% in 2025, an unprecedented 45 percentage point surge over the past decade.

India’s Advancements in Social Protection Coverage

- **Significant Expansion Trends**
 - According to the **International Labour Organization’s (ILO) World Social Protection Report (WSPR) 2024-26**, India’s social protection coverage doubled from 24.4% in 2021 to 48.8% in 2024.
 - More recently, the ILO’s ILOSTAT database shows that India’s social security coverage has surged from 19% in 2015 to 64.3% in 2025, representing an

unprecedented 45 percentage point increase over a decade. This increase marks the fastest expansion in social protection coverage worldwide.

- The **Ministry of Labour and Employment indicates that nearly 920 million people (65% of the population)** are now covered by at least one form of social protection, either cash or in-kind, through central government schemes.
- **Strengthening Social Security: India’s Progress and Global Recognition**
 - India’s advancements have **contributed to a 5-percentage-point increase in global social protection coverage.**
 - India now **ranks second globally in terms of beneficiary count**, providing social protection to approximately 94 crore citizens.
 - The Director-General of the ILO, has praised India’s focused welfare policies for the poor and labour class.
 - India is also the **first country globally to update its 2025 social protection coverage data in the ILOSTAT database**, showcasing its leadership in digital governance and transparency.
 - **Poverty Alleviation:** Over the past decade, 24.8 crore people have escaped multi-dimensional poverty due to various social security measures, reflecting the significant impact of government interventions.

Social Protection

Social protection, or social security, provides benefits to individuals on the basis of risks faced across the life cycle (e.g., unemployment, disability, maternity, etc.) and to those suffering general poverty and social exclusion.

Social protection schemes can be financed through contributions from wages (social insurance) or through general taxation (social assistance).

Key Government Initiatives Driving Social Security

- **Healthcare and Food Security**
 - **Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (AB-PMJAY):** Provides free health coverage of up to Rs.5 lakh per family. As of March 26, 2025, 39.94 crore Ayushman Cards have been issued, accessible at 24,810 empanelled hospitals nationwide.
 - **Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY):** Launched during the COVID-19 pandemic to provide free food grains to vulnerable populations. As of December 2024, 80.67 crore people are receiving free food grains, nearing its intended coverage of 81.35 crore beneficiaries.
- **Employment and Pension Support**
 - **eShram Portal:** Introduced on August 26, 2021, to create a **National Database of Unorganised Workers**

(NDUW). It provides a Universal Account Number (UAN) for enhanced social security. As of March 3, 2025, over 30.68 crore unorganised workers have registered, with 53.68% being women.

- **Atal Pension Yojana (APY):** Launched on May 9, 2015, APY aims to provide **universal social security, particularly for the poor, underprivileged, and unorganised sector workers.** As of December 31, 2024, 7.25 crore beneficiaries have enrolled, with an accumulated corpus of Rs.43,369.98 crore. This scheme, **along with Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY) and Pradhan Mantri Suraksha Bima Yojana (PMSBY),** strengthens the country's social security system.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. India has witnessed a remarkable surge in social protection coverage over the past decade. Discuss the key drivers behind this expansion and critically analyse the role of government initiatives in strengthening social security and poverty alleviation.[250 Words] [15 Marks]

MATERNITY LEAVE AND RIGHTS

Why in News: The Supreme Court ruled that maternity leave is a component of a woman's reproductive rights, setting aside a Madras High Court order denying a woman leave for the birth of her third child.

Key Highlights and Rationale of the Judgment

- **Maternity Leave as a Constitutional Right:** The Supreme Court emphasised that maternity leave is not just about fairness or social justice, but a constitutional guarantee. It is considered an integral part of maternity benefits and a vital aspect of women's reproductive rights. No institution can deny a woman her right to maternity leave.
- **Protection of Women's Health and Dignity:** The bench of Justices Abhay S Oka and Ujjal Bhuyan observed that maternity leave plays a key role in supporting the health and dignity of working women. The court stressed that pregnancy affects both a woman's body and mind, and that both motherhood and childhood require attention. The ruling ensures that women are treated with honour and dignity in the workplace.
- **Right to Reproductive Choice Protected:** The Supreme Court held that the Constitution protects a woman's right to make reproductive choices without undue interference from the State. This right is central to the idea of human dignity, and depriving access to reproductive healthcare or emotional and physical well-being also injures the dignity of women.

- **Overturing of Madras High Court Decision and Specific Case:** The Madras High Court had denied the teacher's leave because Tamil Nadu government policy did not allow maternity leave for a third child, a measure aimed at population control. However, the Supreme Court overturned this decision, ruling that the teacher was entitled to the leave.
- **Interpretation of Maternity Benefit (Amendment) Act, 2017:** The Supreme Court noted that the Maternity Benefit (Amendment) Act, 2017, does not bar maternity leave for women with more than two children. Instead, it limits the duration of leave: 26 weeks for those with up to two children, and 12 weeks for those with more. The court clarified that maternity leave itself is not denied based on the number of children. This amendment also increased maternity leave from 12 weeks to 26 weeks for all women employees and granted 12 weeks of maternity leave to women adopting a child.
- **Reconciling Population Control and Reproductive Rights:** While acknowledging the importance of population control measures, the court stated that **"Population control and reproductive rights are not mutually exclusive goals.** They must be reconciled in a rational, humane manner". This reaffirms the Supreme Court's stance that policies must align with constitutional rights when it comes to women's health and workplace entitlements.
- **Article 21 (Right to Life):** The apex court emphasized Article 21 of the Constitution, explaining that "life in its fullest sense" includes all that makes life meaningful, such as the right to health, the right to live with human dignity, and the right to privacy, which are now acknowledged facets of Article 21.

Provisions of the Maternity Benefit Act, 1961

- **Applicability:** The Act applies to establishments such as **factories, mines, plantations, and government establishments** involved in acrobatic or equestrian performances. It also covers any organisation **employing more than 10 employees in the preceding 12 months**, including shops and other establishments. The Act's provisions extend across the whole of India, covering public hospitals, nursing homes, and schools.
- **Eligibility:** To be entitled to benefits, a woman must have been employed in the establishment for a period of at least 80 days in the 12 months immediately preceding her expected delivery date.
- **Maternity Leave Benefits**
 - The leave period was significantly increased from 12 weeks to 26 weeks following amendments in 2017.
 - This 26-week period can be availed as up to 8 weeks before the due date of delivery and the remaining weeks after childbirth.
 - For women with two or more surviving children, the maximum leave duration is 12 weeks, with not

more than six weeks preceding the delivery date. The Supreme Court has clarified that maternity leave is not denied based on the number of children, only the duration is limited.

- Adoptive mothers (for a child below three months) and commissioning mothers are also entitled to 12 weeks of maternity leave from the date the child is handed over.
- **Payment:** Maternity benefit is paid at the rate of the average daily wage for the period of actual absence.
- **Leave for Miscarriage/Medical Termination of Pregnancy:** A woman is entitled to six weeks of paid leave immediately following a miscarriage or medical termination of pregnancy.
- **Leave for Tubectomy Operation:** Two weeks of leave with wages are provided after a tubectomy operation.
- **Leave for Illness:** An additional maximum of one month of leave with wages is provided for illness arising from pregnancy, delivery, premature birth, miscarriage, medical termination of pregnancy, or tubectomy operation.
- **Work from Home:** Employers may allow a woman to work from home after she avails maternity benefits, on mutually agreed conditions.
- **Nursing Breaks:** Every woman who returns to duty after childbirth is allowed two breaks daily for nursing her child until the child reaches 15 months of age.
- **Crèche Facility:** Establishments with 50 or more employees must provide a crèche facility within a prescribed distance, allowing women four visits a day.
- **Protection Against Dismissal:** It is unlawful for an employer to discharge or dismiss a woman during or because of her absence for maternity leave, or to disadvantageously alter her service conditions. Dismissal during pregnancy generally does not deprive her of maternity benefits or medical bonus, unless for prescribed gross misconduct.
- **Medical Bonus:** Women are entitled to a medical bonus of one thousand rupees if the employer does not provide free pre-natal and post-natal care. The Central Government can increase this amount up to twenty thousand rupees.
- **No Wage Deduction:** No deductions from wages are allowed for the nature of work assigned due to pregnancy or for nursing breaks.
- **Information Provision:** Employers must inform women about all benefits available under the Act at the time of their initial appointment.

Conclusion

The Supreme Court's landmark judgment affirms that maternity leave is not merely a workplace benefit but a constitutional right grounded in a woman's reproductive freedom and dignity. It reinforces that policies must align with Article 21 and uphold human rights, especially for working mothers. By interpreting the Maternity Benefit Act through a

rights-based lens, the Court ensures inclusive, humane, and equitable protection for all women, regardless of the number of children they have.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. "Reproductive rights are an essential component of the right to life and dignity under Article 21." In light of this statement, critically examine the significance of the Supreme Court's recent judgment on maternity leave. Also discuss how this ruling aligns with the objectives of the Maternity Benefit (Amendment) Act, 2017. [250 Words] [15 Marks]

GOA AND MIZORAM ACHIEVES FULL FUNCTIONAL LITERACY

Why in News: Recently, Mizoram and Goa were officially declared fully functionally literate under the ULLAS - Nav Bharat Saaksharta Abhiyan (New India Literacy Programme).

Key Details

- The **ability to read and write simple texts as well as to use these skills successfully in day-to-day situations** is known as full functional literacy.
- It includes fundamental literacy and numeracy skills that allow people to **understand, communicate, and carry out simple mathematical operations** that are necessary for daily tasks.
- By combining essential life skills, career training, and digital awareness, functional literacy **goes beyond basic education and enables people to actively engage in socioeconomic activities and make informed decisions.**
- It is essential for **encouraging independence, improving employability, and advancing inclusive growth.**

Significance of full functional literacy

- **Public Empowerment:** It gives citizens the fundamental reading, writing, and numeracy skills they need to engage with daily life, the workplace, and community issues with confidence.
- **Economic Productivity:** Workers with functional literacy make more productive contributions to the economy, particularly in microbusinesses and the unorganised sector.
- **Gender Justice:** Women's literacy increases their ability to make decisions, become financially independent, and provide future generations with access to education.
- **Public Participation:** People who are literate are more likely to participate in democratic processes, use government programs, and hold institutions responsible.
- **Inclusive Development:** Makes sure that under-represented groups—particularly women and rural communities—do not fall behind in the nation's socioeconomic advancement.

- **Digital Inclusion:** The cornerstone of digital literacy is functional literacy, which enables users to access digital banking, e-learning, mobile apps, and online services.
- **Viksit Bharat Vision 2047:** Reaching the overarching national objective of a developed, inclusive, and empowered India requires full functional literacy.

ULLAS - Nav Bharat Saaksharta Karyakram or New India Literacy Programme (NILP)

- Learners who possess **digital and financial literacy** (not just the ability to sign or write their names) as well as the ability to read, write, and perform simple maths are considered literate.
- **Centrally Sponsored Scheme**
- **Duration:** FY 2022-23 to 2026-27.
- **Administrative Ministry:** Ministry of Education.
- **Target Group:** Adults aged 15 and above from all backgrounds who couldn't go to school.
- **Five components:** Basic education, vocational skills, critical life skills, continuing education, and foundational literacy and numeracy.
- **Vision:** Based on the spirit of Kartavya Bodh, the ULLAS Scheme's vision is to make Bharat Jan Jan Saakshar through volunteerism.
- **Assessment and Certification:** Local schools administer the FLNAT (Foundational Literacy and Numeracy Assessment Test) twice a year or as needed. To date, over 1.77 crore students (neo literates) nationwide have taken the Foundational Literacy and Numeracy Assessment Test (FLNAT).
- **Use of Regional Languages:** To obtain educational resources via the DIKSHA Portal and the ULLAS Mobile App/Portal.
- Over **2.40 crore students and 41 lakh volunteer teachers** have registered on the ULLAS Mobile app.

Conclusion

Through the ULLAS initiative, India is moving closer to its NEP 2020 goal of full literacy by 2030, ensuring no adult is left behind in the nation's development journey.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding ULLAS scheme:

1. It is a central sector scheme
2. It is administered by the Ministry of Social Justice
3. It aims to promote literacy among school children

How many of the statements given above is /are correct?

- (a) Only one (b) Only two
 (c) All three (d) None

(d) Answer: A

Descriptive Question

Q. "Functional literacy is the cornerstone of inclusive and participatory governance." Examine the statement in the context of the ULLAS - Nav Bharat Saaksharta Abhiyan. [150 Words] [10 Marks]

RARE DISEASES IN INDIA AND THE ROLE OF COMPULSORY LICENSING

Why in News: Recently rare disease patients have filed a petition in the Karnataka High Court urging the government to invoke the compulsory licensing provision, allowing others to manufacture life-saving drugs without the patent holder's consent.

Rare Diseases

- A rare disease is any disease that **affects a small percentage of the population**. According to the **World Health Organization (WHO)**, a disease is considered rare if it affects no more than 1 in every 1,000 people.
- In some parts of the world, the term **orphan disease** describes a rare disease whose rarity results in little or no funding or research for treatments, without financial incentives from governments or other agencies.
- **Orphan drugs** are medications targeting orphan diseases. Most rare diseases are genetic in origin and thus are present throughout the person's entire life, even if symptoms do not immediately appear.

National Policy for Rare Diseases (NPRD)

- **Ministry of Health & Family Welfare** launched National Policy for Rare Diseases (NPRD) in March 2021. The key features of NPRD, 2021 are as under:
- The rare diseases have been identified and categorized into 3 groups as below:
 - **Group 1:** Disorders amenable to one-time curative treatment.
 - **Group 2:** Diseases requiring long term/lifelong treatment with relatively lower cost of treatment.
 - **Group 3:** Diseases for which definitive treatment is available but challenges are to make optimal patient selection for benefit, very high cost and lifelong therapy.
- **12 (Twelve) Centres of Excellence (CoEs)** have been identified so far, which are premier Government tertiary hospitals with facilities for diagnosis, prevention and treatment of rare diseases.
- In order to receive financial assistance for treatment of rare disease, the **patient may approach nearby or any Centre of Excellence to get registered.**

- Ministry of Health and Family Welfare has **obtained exemption from Department of Expenditure on Goods & Services Tax (GST) and Basic Customs Duty on drugs imported for Rare Diseases** for individual use and through CoE.
- As envisaged in the policy, Department of Health Research has established the National Consortium for Research and Development on Therapeutics for Rare Diseases (NCRDTRD) for streamlining the research activities for rare diseases.
- Currently, **63 rare diseases are included under National Policy for Rare Diseases** on recommendation of Central Technical Committee for Rare Diseases (CTCRD). The list of rare diseases is at Annexure II.
- **Financial support of up to Rs. 50 lakhs per patient is provided** for the treatment at the notified Centres of Excellence (CoEs) for Rare Diseases.

What is compulsory licensing?

- Compulsory licensing is when a government allows someone else to produce a patented product or process without the consent of the patent owner or plans to use the patent-protected invention itself.
- It is one of the flexibilities in the field of patent protection included in the WTO's agreement on intellectual property the TRIPS (Trade-Related Aspects of Intellectual Property Rights) Agreement.

Compulsory Licensing in India

- In India, the conditions for granting compulsory licenses are outlined in **Chapter XVI (Sections 84 to 92) of the Indian Patents Act, 1970.**
 - **Section 84 of the IP Act, 1970:** This section allows any person to apply to the Controller of Patents for a compulsory license after three years from the date of grant of a patent, if any of the following conditions are satisfied:
 1. The reasonable requirements of the public with respect to the patented invention are not being met.
 2. The patented invention is not available to the public at a reasonably affordable price.
 3. The patented invention is not being worked (i.e., manufactured or used) within the territory of India.
- **Section 92 of the IP Act, 1970:** Under this section, the Controller may grant a compulsory license suo motu (on their own initiative) following a notification from the Central Government in cases of national emergency, situations of extreme urgency, or for public non-commercial use.


EXPECTED QUESTION FOR UPSC CSE

Descriptive Question


Q. Discuss the significance of compulsory licensing in the context of rare diseases in India. How does the National Policy for Rare Diseases, 2021 address the challenges faced by patients suffering from such conditions? [250 Words] [15 Marks]


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HISTORY & CULTURE

NEOLITHIC DISCOVERIES IN ASSAM

Why in News: Evidence of Neolithic habitation has been discovered in Assam's Dima Hasao district, shedding light on early human settlement and cultural practices in the region.

Key Details: About the Daojali Hading Site

- The **discovery of a furnace and iron slag, indicating metallurgical activities**, has provided "substantial support" for earlier hypotheses that Daojali Hading was a major prehistoric settlement in the northeastern part of India.
- These artefacts were among several found by a multidisciplinary team during a recent **archaeological reconnaissance survey at Daojali Hading** on the ridges within the Langting-Mupa Reserve Forest off National Highway 27.

- The **Langting-Mupa Reserve Forest** has long been recognised for its Neolithic significance. The **Daojali Hading site** in the vicinity was uncovered during the construction of the Lumding-Haflong Road in the 1960s, leading to systematic excavations from 1962 to 1964 by professors T.C. Sharma and M.C. Goswami of the Gauhati University's Department of Anthropology.
- These investigations revealed polished **double-shouldered celts, cord-marked pottery, mortars and pestles, besides jadeite stone, confirming the site's neolithic affiliation**. The unearthed artefacts linked the site with the broader Eastern and Southeastern Asian Neolithic cultural complex.

About the Neolithic Period

- The Neolithic Period marks the **final phase of the Stone Age**. It is notable for the development of megalithic structures, the widespread adoption of agriculture, and the use of polished stone tools.



- This era represents a crucial turning point in human cultural evolution, as people began to **shift from complete dependence on nature** to actively harnessing and managing natural resources for their benefit.
- In contrast to the Palaeolithic (Old Stone Age) period, people during the Neolithic era started using **polished stone tools and axes, commonly known as celts**. Additionally, Neolithic communities also used tools and weapons made from bone.
- The concept of the Neolithic Revolution refers to **the beginning of agriculture, domestication of animals, and the shift toward a settled lifestyle**.
- It signifies the transition of human societies from a hunting and gathering economy to one based on food production through farming and herding.
- With the introduction of agriculture, people needed to store harvested grains, cook food, access drinking water, and consume prepared meals. This necessity led to the **emergence of pottery** during the Neolithic Age.
- The Neolithic Age is also notable for the **development of Megalithic Architecture**.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the Neolithic Period:

1. The Neolithic Revolution refers to the shift from a hunting-gathering lifestyle to one based on agriculture and animal domestication.
2. Polished stone tools, pottery, and bone tools were commonly used during the Neolithic period.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Answer: (c)

KACHCHH'S ANCIENT SHELL CHRONICLES

Why in News: A recent study by researchers from the Indian Institute of Technology Gandhinagar (IITGN) and collaborating institutions has uncovered significant archaeological evidence in the Kachchh region of Gujarat, revealing human habitation that predates the Harappan civilisation.

The Site Details

- **Location:** The study focused on the Kachchh region in Gujarat, specifically including **Khadir and nearby islands**. Khadir Island is also known for housing the Harappan city of Dholavira.
- **Landscape:** These early communities inhabited a **mangrove-dominated landscape**.
- **Site Type:** The study is the first to identify these sites as shell-midden sites, which are heaps of discarded shells from human consumption. While British surveyors had previously noted shell accumulations, they did not recognise their cultural significance as shell-middens.
 - The newly identified sites are also the first of their kind to be documented in the Kachchh region with a defined cultural and chronological context.

Important Findings

- **Earlier Human Presence**
 - The study has uncovered **compelling archaeological evidence that pushes back the human presence in this region by at least five thousand years** before the arrival of the Harappans.
 - The shell midden sites date back to a period significantly earlier than the Harappan era, providing rare evidence of human settlement from a much earlier time.
- **Hunter-Gatherer Communities and Subsistence**
 - The region was home to thriving prehistoric hunter-gatherer communities.
 - These communities primarily relied on **shell species (both bivalves like oysters and gastropods)**, naturally adapted to mangrove environments, as a significant food source.
- **Tool Technology**
 - In addition to shell scatters and deposits, the team discovered a variety of stone tools.
 - These tools were used for cutting, scraping, and splitting.
 - Used cores, from which tools were manufactured, were also found, suggesting the communities engaged in the **prolific manufacture of implements for daily tasks**.
 - The raw materials for these tools may have been sourced from Khadir Island, though other sources are also possible.
- **Cultural Connections and Evolution**
 - The findings show similarities with coastal archaeological sites in the **Las Bela and Makran regions of Pakistan and the Oman Peninsula**. This suggests that early coastal communities across this broader region may have developed comparable strategies for food collection and survival.
 - The study challenges the common view that urbanism in Kachchh developed primarily under the influence

13TH CENTURY PANDYA-ERA SHIVA TEMPLE

Why in News: An 800-year-old Shiva temple of the later Pandya period has been unearthed at Udampatti, a village in Tamil Nadu.

Key details of the findings

- With the help of the engravings on the foundation stone and Silpa Sastram as a reference, the temple was found to have been **dedicated to Lord Shiva**.
- The temple was **built in 1217-1218 CE, during the reign of Maravarman Sundara Pandya**.
- The inscription mentions Attur as the name of the village, and **the temple was called Thennavanisvaram. (Thennavan is a title used by the Pandyas)**
- The inscriptions are a **sale deed of a waterbody by one Alagaperumal**, chieftain of Kalavalinadu, to one Nambi Perambala Kuthan alias Kangeyan. The waterbody, called Nagankudi, along with wet and dry land, was sold for **64 kasu (coins)**.
- The **four boundaries of the land and the waterbody** that had been sold have been defined in the inscriptions. It has also been mentioned that the **tax due to the land should be given to the God of Thennavanisvaram of Attur** for its day-to-day expenses.
- These inscriptions disclose the old name of Udampatti, which was formerly known as Attur, as well as the socioeconomic forces at work during the later Pandya era.

The Pandya Kingdom – Origin & Sources

- After the Kalabhras, the Pandyas consolidated their **dynastic control over southern Tamil Nadu by the end of the sixth century CE**.
- Up until premodern times, the Pandyas were **one of the Muvendars who ruled the southern region of India**, albeit sporadically.
- The heads of the three ruling families—the **Cholas, Cheras, and Pandyas**—are **referred to as Muvendar**, a Tamil word meaning three chiefs.
- A number of sources, including megalithic burials, inscriptions in Tamil Brahmi, and the Tamil poetry of the Sangam literature, have been used to reconstruct the history of the Pandyas during the Sangam period, which lasted from about the third century BCE to the third century CE.
- **Travellers like Marco Polo, Wassaff, and Ibn-Battuta** have written accounts that are helpful in understanding the political and socio-cultural developments of this era.

The Re-Rise of Pandyas

- In the **thirteenth century**, the Pandya kingdom emerged as the dominant Tamil dynasty **following the fall of the Cholas**.

- **Sadaiyavarman Sundarapandyan (1251–1268)** was the **renowned ruler of the second Pandya kingdom**. He ruled over all of Tamil Nadu and extended his power as far as Nellore in Andhra.
- Following Sundarapandyan, **Maravarman Kulasekharan** ruled effectively for 40 years, bringing prosperity and peace to the kingdom.
- It was Malik Kafur's invasion that finally led to the division and downfall of the Pandya empire.

Pandya Empire – Administration

- **Madurai served as the capital of the Pandya empire** during the ancient and medieval period.
- In terms of political division, **Pandy Mandalam**, or Pandya Nadu, was made up of numerous **valanadus**, which were further subdivided into numerous **nadus** and **kurrams** (groups of villages).
- Kings and local chiefs created Brahmin settlements called **Mangalam or Chaturvedimangalam**.
- The prime minister was known as **Uttaramantri**.
- The **royal secretariat was known as Eluttu Mandapam**.
- **Tennavan Tamizhavel, Maran Adittan, Parantakan Pallivelan, and Palli Velan** were the titles of the military commanders.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Pandya dynasty:

1. Madurai served as the capital of the Pandyan kingdom.
2. The smallest political division in the Pandyan empire was Nadu and kurram.
3. The prime ministers of Pandyan Kingdom known as Uttaramantri.

How many of the statements given above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Answer: (c)

KARNI MATA TEMPLE

Why in News: Prime Minister Narendra Modi recently visited the Karni Mata temple in Deshnok, a small town about 30 km from Bikaner, Rajasthan.

About Karni Mata Temple

- The Karni Mata Temple is a historical place of **worship located in Deshnok**, a small town approximately 30 km from Bikaner, Rajasthan.

Key Characteristics and Principles of the Servants of India Society (SIS)

- **Secularism:** The Society was regarded as the first secular organisation in India to commit itself to the underprivileged, rural, and tribal populations, and other social causes. It actively worked to unite people of different ethnicities and religions for welfare purposes, which directly aided in the integration of the masses during the independence movement.
- **Non-political and Non-sectarian Nature:** Despite having objectives related to “political education and agitation,” the Society was described as “non-political and non-sectarian”. This suggests its primary focus was on serving the greater good of the country through social and educational means, transcending partisan politics or religious divides.
- **Emphasis on Education and Empowerment:** The SIS fundamentally believed that education and the empowerment of citizens were key to India’s progress and development. They aimed to create young leaders committed to serving the people. The organisation promoted education at all levels, ensuring access to quality education for all.

- **Encouragement of Social Service and Civic Engagement:** The Society stressed that social service was an essential aspect of citizenship and worked to encourage young people to participate in social service activities, promoting social justice and equality. It also fostered civic engagement, believing it was vital for democracy and good governance.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following personalities:

- | | |
|------------------|--------------------|
| 1. G.K. Devadhar | 2. A.V. Patwardhan |
| 3. N.A. Dravid | |

How many of the above were members of the Servants of India Society (SIS)?

- | | |
|---------------|--------------|
| (a) Only one | (b) Only two |
| (c) All three | (d) None |

Answer: (c)



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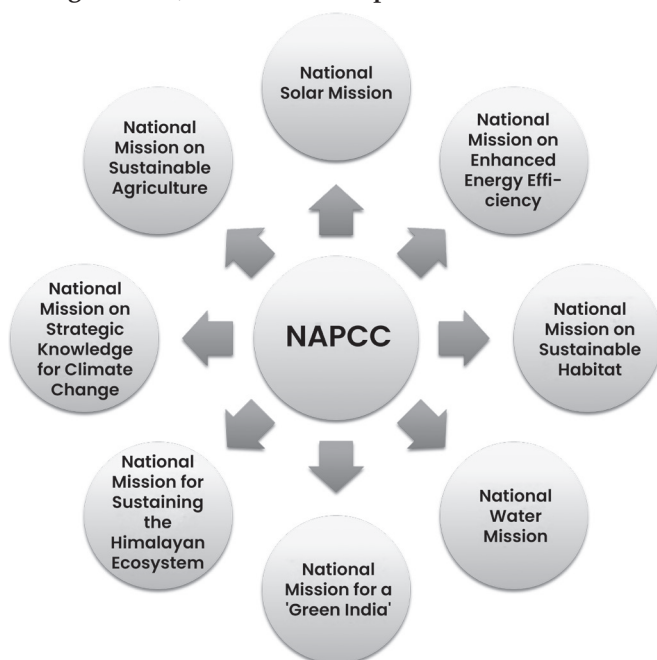
GOVERNMENT SCHEMES

GREEN INDIA MISSION

Why in News: Recently the Government of India released a revised roadmap for the National Mission for Green India, also known as the Green India Mission (GIM).

About the Green India Mission

- GIM was rolled out in 2014 as one of the eight missions under India's National Action Plan on Climate Change (NAPCC).
- Its core aim is to combat climate change by increasing forest and tree cover, and the ecological restoration of degraded ecosystems and forests.
- It also aims to improve the livelihoods of communities dependent on forest produce.
- More specifically, its objective was to increase forest and tree cover on 5 million hectares and improve the quality of forest cover on another 5 million hectares.
- Activities under GIM are concentrated in states based on mapping of ecological vulnerability, potential for sequestration (the process by which plants and trees store carbon using photosynthesis), forest and land degradation, and restoration potential.



Key Achievements of the Mission

- Between 2015-16 and 2020-21, the mission facilitated tree plantation and afforestation activities across 11.22

million hectares (mha) of land, through central and state schemes.

- Between 2019-20 and 2023-24, the Centre released Rs 624.71 crore to 18 states for interventions under GIM and Rs 575.55 crore has been utilised, according to an Environment Ministry response tabled in Lok Sabha this February.

What does the revised roadmap entail?

- The Green India Mission document was revised to account for on-ground climate impacts and feedback received from implementing partner states and scientific institutions.
- A central focus of the revised mission plan will be on the restoration and saturation of vulnerable landscapes through regionally conducive best practices.
- This will see area and landscape-specific restoration activities in three important mountain ranges – the Aravallis, the Western Ghats, and the Indian Himalayas, along with the mangrove ecosystems.
- For instance, GIM interventions will be synced with the Centre's recently launched Aravalli Green Wall project, aimed at combating the degradation and desertification in one of the world's oldest mountain ranges, which acts as a natural barrier against the Thar desert.

Focused Restoration in Aravalli Ranges and Western Ghats

- Studies by the Wildlife Institute of India have revealed in the past that 12 gaps that exist within the Aravalli range have widened due to the loss of forests and degradation.
- These gaps have contributed to frequent sandstorms and dust pollution in the districts of Delhi-National Capital Region and even in Punjab.
- Under the Green Wall project, restoration works have been planned initially across 8 lakh hectares spanning 29 districts and four states.
- This would be done in forest areas, grasslands, water systems and their catchment areas, and through the plantation of native, locally conducive species.
- The project is estimated to cost Rs 16,053 crore and aims to create a buffer zone of 5 km around the mountain range, covering 6.45 million hectares.
- In the Western Ghats, where degradation, deforestation and illegal mining are prevalent, the GIM will push to conserve through afforestation, groundwater recharge and eco-restoration of abandoned mining areas.

How will the revised GIM combat land degradation and desertification?

- Around a **third of India's geographical area – 97.85 million hectares** – underwent land degradation during 2018-19, according to the **Indian Space Research Organisation's Desertification and Land Degradation Atlas**.
- India aims to create an additional carbon sink of **2.5 to 3 billion tonnes of carbon dioxide through additional forest and tree cover by 2030**, according to its national commitments to tackle climate change submitted to the United Nations Framework Convention on Climate Change.
- The natural carbon sinks of forests, restored grasslands, wetlands, and mountain ecology will help **offset greenhouse gas emissions and act as natural sponges** and barriers in absorbing climate change impacts.
- India has also made an **ambitious commitment to restore 26 million hectares of degraded land by 2030**.
- The GIM and allied interventions, such as the Green Wall project, are **all designed to help meet these goals**. During the 2005-2021 period, an additional carbon sink of 2.29 billion tonnes of CO₂ equivalent has been created, as per an environment ministry statement made in the Lok Sabha this year.
- To restore large swathes of forests and degraded lands, **restoration of impaired open forests is key**, cost-effective and high-impact for CO₂ sequestration, the revised GIM roadmap says, based on Forest Survey of India's (FSI) estimates.
- According to the FSI, this approach alone has the **potential to sequester 1.89 billion tonnes of CO₂ over approximately 15 million hectares**.
- It also estimates that by aligning ongoing schemes and intensifying afforestation efforts, GIM can help **India expand its forest and tree cover up to 24.7 million hectares**. This would be enough to achieve a carbon sink of 3.39 billion tonnes of CO₂ equivalent by 2030, as per the FSI's projections.

Conclusion

The revised Green India Mission **takes a more focused and region-specific approach**, aiming to restore vulnerable landscapes like the Aravallis, Western Ghats, and mangroves. By tackling land degradation and boosting carbon sinks, it plays a key role in helping India meet its climate and restoration targets by 2030.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the significance of the revised Green India Mission in addressing the challenges of land degradation and climate change in India. [150 Words] [10 Marks]

PRADHAN MANTRI SURAKSHIT MATRITVA ABHIYAN (PMSMA)

Why in News: India's Maternal Mortality Ratio (MMR) has declined by 50 points in the nine years of Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA).

About the Scheme

- Launched in **2016**, the Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA) is a flagship initiative of the **Ministry of Health and Family Welfare**.
- It was designed to provide **assured, comprehensive, and quality antenatal care (ANC) services free of cost** to all pregnant women on the 9th of every month, particularly during the second and third trimesters.
- The PMSMA aligns with the broader goals of the **Reproductive, Maternal, Newborn, Child, and Adolescent Health plus Nutrition (RMNCAH+N) strategy** under the National Health Mission (NHM).
- **Aim:** The core aim is to reduce maternal and neonatal mortality by facilitating early detection and prompt management of high-risk pregnancies.
- The programme follows a systematic approach to **engagement with the private sector**, which includes motivating private practitioners to volunteer for the campaign, helping to develop strategies for spreading awareness, and participating in the Abhiyan at government health facilities.
- As of now, **6.19 crore pregnant women** have been examined under PMSMA.

Key Features

- **Monthly antenatal checkups** on the 9th of every month at public health facilities.
- Services provided by OBGY specialists, radiologists, physicians, with private sector support.
- **Minimum package for every woman:** Essential investigations (including 2nd trimester ultrasound) and medicines (IFA, calcium).
- **Single window system** for all ANC services and investigations.
- **Special focus on:**
 - Unregistered or missed ANC women
 - Dropouts
 - High-risk pregnancies
- Distribution of Mother and Child Protection Cards and safe motherhood booklets.
- **High-risk pregnancy identification:**
 - Green sticker: no risk
 - Red sticker: high risk

- The scheme is implemented and monitored by **RBI and NABARD**.
- **Objective:** To guarantee that farmers can obtain **short-term credit** through Kisan Credit Card (KCC) at a **reasonable interest rate**.
- **Provision for loans:** Short-term loans with a **7% subsidised interest rate up to Rs. 3 lakh**.
- **Interest subvention:** Qualified lending institutions receive a **1.5% interest subvention**.
- **Prompt Repayment Incentive:** Farmers who make timely loan repayments can receive an incentive of **up to 3%**.
- Up to **Rs. 2 lakh in interest** is available on loans taken out specifically for **fisheries or animal husbandry**.

Benefits of the scheme

- **Sustainable credit flow:** An increase in Interest Subvention will ensure sustainability of credit flow in the agriculture sector at a cheaper rate to farmers.
- **Financial health of lending institutions:** Banks will be able to absorb the increase in the cost of funds and will be encouraged to grant loans to farmers for short-term agriculture requirements.
- **Creation of jobs:** Since short-term agricultural loans are available for all industries, including fisheries, dairy, poultry, and animal husbandry, an increase in agricultural credit will result in the creation of jobs.

Key Highlights of Agriculture Credit

- **Amount of institutional credit:** By December 2024, the amount of institutional credit disbursed through KCC had grown from Rs. 4.26 lakh crore in 2014 to **Rs. 10.05 lakh crore**.
- In FY 2023–2024, the total **amount of agricultural credit flow** increased from Rs. 7.3 lakh crore in FY 2013–14 to **Rs. 25.49 lakh crore**.
- **The Kisan Rin Portal (KRP)**, which was introduced in August 2023, is one example of a digital reform that has improved claim processing efficiency and transparency.

Conclusion

The continuation of the Modified Interest Subvention Scheme ensures affordable short-term credit for farmers, supports the financial health of lending institutions, and promotes rural employment. With over 7.75 crore KCC accounts, such measures are crucial for sustaining agricultural productivity and deepening financial inclusion for small and marginal farmers.

SCHEME TO PROMOTE MANUFACTURING OF ELECTRIC PASSENGER CARS IN INDIA

Why in News: Recently, the central government approved a forward-looking scheme to promote the domestic

manufacture of passenger cars, with a special focus on electric vehicles (EVs).

Key Details

- **Administrative Ministry:** Ministry of Heavy Industries
- **Local manufacturing:** The scheme seeks to **promote India as a location for e-vehicle manufacturing** and draw investments from international EV manufacturers.
- Along with **creating jobs** and **advancing the “Make in India” movement**, the scheme will help establish India as a major player in the global EV manufacturing market.

Key Features

- **Customs Duty Concession:** Approved companies can import electric cars (costing at least USD 35,000) at a **reduced 15% duty, for up to 8,000 units per year, valid for 5 years**. All unused annual import limits would be allowed to be carried over.
- **Investment:** Companies must **invest at least 4,150 crore within 3 years**, set up manufacturing units, and start production.
- **Domestic Value Addition (DVA):** Companies must achieve **25% local value addition in 3 years and 50% in 5 years**, in line with the PLI Scheme for Automobiles & Auto Components.
- **Eligibility Criteria:** **Global group automotive revenue - Minimum 10,000 crore**, based on audited financials at the time of application and **Fixed asset investment** of at least 3,000 crore, globally.

Conclusion

This landmark initiative is **aligned with India’s national goals of achieving net zero by 2070**, fostering sustainable mobility, driving economic growth, and reducing environmental impact.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Discuss the significance of the recently approved scheme to promote electric passenger vehicle manufacturing in India. How does it align with India’s goals of sustainable mobility, economic development, and climate commitments under the net-zero target? [250 Words] [15 Marks]

SWACHH SURVEKSHAN GRAMEEN (SSG)

Why in News: Union Minister of Jal Shakti launched Swachh Survekshan Grameen (SSG) 2025, a nationwide rural sanitation survey by the Department of Drinking Water and Sanitation (DDWS), Ministry of Jal Shakti.

Objectives of Swachh Survekshan Grameen-2025

- To rank States/UTs & Districts' performance based on SBM-G Phase II parameters.
- To compare inter- and intra- District performance on SBM-G Phase II parameters.
- To assess the Swachhata progress through a sample survey of villages, households, public places, SGLR sites and various plants.
- To project SBM-G coverage at the National Level (India-Level Projection).

Assessment Methodology and Parameters

- The assessment involves sampling village evaluations and surveying households (HH) and public places within villages.
- It rigorously assesses their status based on various cleanliness parameters.
- **Key infrastructure and initiatives to be assessed for functionality include:**
 - Plastic Waste Management Units (PWMU)
 - Faecal Sludge Management (FSM) plants/systems
 - GOBARdhan plants
 - Swachhata Green Leaf Rating (SGLR) sites
- The survey also verifies the status of ODF Plus Model villages, schools, public buildings, Common Service Centres (CSCs), and other institutions.

Four Key Components for Ranking

- **Service-Level Progress (SLP):** This component is based on data from district self-assessment reports and desktop verification of ODF Plus Model Verified villages.
- **Direct Observation of Sanitation Status of Villages:** This involves field-based observation in sampled villages, households, and public places, including schools and CSCs.
- **Direct Observation of Functionality of Sanitation Infrastructure:** This assesses the functionality of key sanitation infrastructure such as Plastic Waste Management Units, GOBARdhan plants, and Faecal Sludge Management systems.
- **SSG 2025 Citizen Feedback:** This crucial component gathers feedback directly from citizens via a dedicated mobile application and one-on-one interactions during the field survey.

COLLECTION OF REAL TIME OBSERVATIONS & PHOTO OF CROPS (CROPIC)

Why in News: The Ministry of Agriculture and Farmers Welfare plans to launch CROPIC, a study to gather crop information using field photographs and AI-based models.

What is CROPIC?

- CROPIC stands for **Collection of Real Time Observations & Photo of Crops**.

- Its core function involves photographing crops four to five times during their growth cycle.
- These pictures will then be analysed to assess crop health and identify potential mid-season losses.

How CROPIC Works on the Ground

- **Data Collection:** The study envisages the collection of field photographs during the crop season using a mobile application called the CROPIC Mobile App. This app has been developed by the Union Ministry of Agriculture and Farmers' Welfare.
- **Crowd-Sourcing:** The photographs from the field will be crowd-sourced directly from farmers.
- **Analysis and Visualisation:** The collected photographs will be analysed for crucial information, including crop type, crop stage, crop damage, and its extent. The CROPIC model will utilise an AI-based cloud platform for this photo analysis and information extraction, complemented by a web-based dashboard for visualisation.
- **Application in Compensation:** The CROPIC Mobile App will also be used by officials to collect photographs when compensation or insurance payments are due to farmers.

Purpose and Significance

- CROPIC is a key initiative under the **Pradhan Mantri Fasal Bima Yojana (PMFBY)**, India's flagship crop insurance scheme.
- Its primary objectives include **monitoring crop health and stress, automating crop loss assessment, and enabling timely claim settlements** for affected farmers through the use of computer vision technology and photo-analytic models.
- Additionally, the initiative aims to build a **comprehensive directory of crop signatures**, supporting digital innovation in agriculture and strengthening financial resilience for farmers.

Funding

- The funding for CROPIC will come from the **Fund for Innovation and Technology (FIAT)**, which operates under the PMFBY. The FIAT has a total outlay of Rs 825 crore designated for various technology innovations within crop insurance schemes.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

- Q. Which of the following ministries is responsible for launching the CROPIC initiative?
- Ministry of Statistics and Programme Implementation
 - Ministry of Electronics and Information Technology
 - Ministry of Information and Broadcasting
 - Ministry of Agriculture and Farmers Welfare

Answer: (d)

STATE AND TRENDS OF CARBON PRICING 2025

Why in News: Countries are increasingly adopting carbon pricing, which now represents almost two-thirds of global Gross Domestic Product, according to a new World Bank report titled State and Trends of Carbon Pricing 2025.

Key Highlights of the Report

- **Rise in Carbon Pricing Instruments:** The number of operational carbon pricing instruments **has grown significantly, from 5 in 2005 to 80 today**, with India, Brazil, and Türkiye actively developing them.
- **Carbon Pricing as a Revenue Tool:** Governments, according to the World Bank, view carbon pricing not only as a tool to reduce emissions, but also as a **potential source of revenue for fiscally constrained governments**.
- **Global Emission Coverage:** Carbon pricing instruments **now cover approximately 28 per cent of global GHG emissions**. The report noted that most new and planned instruments are Emissions trading systems (ETS).
 - In 2024, **the Indian government established regulations for its planned ETS**, which will target emissions intensity reductions in India's industrial sector. India's ETS, however, will be rate-based, meaning emissions are not capped. Instead, emitters are allocated a performance benchmark that serves as a limit on their net emissions.
- **Sectoral Coverage of Carbon Pricing:** Among the different sectors, **carbon pricing coverage was highest in the power sector**, followed by industry, mining and extractives sector, buildings, land transport and aviation. However, **waste and agriculture are largely not covered by carbon pricing**.
- **Carbon Credit Markets and Private Finance:** Carbon credit markets, the report stated, can **attract private finance to development projects that reduce or remove emissions** from the atmosphere. Of these projects, nature-based carbon removal projects received the highest share of the estimated \$14 billion raised in Q1-Q3 of 2024.

Understanding Carbon Pricing and Its Mechanisms

- Carbon pricing instruments **capture the external costs of greenhouse gas (GHG) emissions**. These external costs—such as damage to crops, healthcare expenses from heat waves and droughts, and property loss from flooding and sea level rise—are typically borne by the public. Carbon pricing mechanisms

tie these costs to their sources, usually through a price on emitted carbon dioxide (CO₂).

- The report covers three types of carbon pricing instruments: **Emissions trading system (ETS), carbon taxes and carbon credit trading mechanisms**.
 - An ETS involves governments setting a limit, or cap, on the amount or intensity of GHG emissions generated by emitters. Companies are allowed to trade emission units to meet their targets. If they implement internal measures to lower their emissions, they can sell these units to other emitters.
 - A **carbon tax** explicitly prices carbon by defining a tax rate on GHG emissions or the carbon content of fossil fuels. Governments can levy this fee on companies for their GHG emissions.
 - A **crediting mechanism** allows the trading of credits (each representing 1 tonne of carbon equivalent) generated through activities that reduce emissions (e.g., capturing methane from landfills) or remove them (e.g., sequestering carbon through afforestation). Companies can then purchase these credits to offset their own emissions.

STATE OF WORLD POPULATION (SOWP) REPORT

Why in News: Recently, the United Nations Population Fund (UNFPA) published the State of World Population (SOWP) Report, titled 'The Real Fertility Crisis.'

Key Highlights of the Report

- **Population Size & Growth**
 - India's population is estimated to reach **1.46 billion in 2025**, continuing to be the highest in the world, while the **Total Fertility Rate (TFR) declined to 1.9**, falling below the replacement level of 2.1.
 - **The population is projected to reach 170 crores in the next 40 years before beginning to decline.**
- **Fertility crisis**
 - One in three adult Indians (**36%**) **face unintended pregnancies**, while **30% experience an unfulfilled desire for having either more or fewer children**.
 - Nearly **4 in 10 people** said **financial limitations** are stopping them from having the families they want.
 - Job insecurity (21%), housing constraints (22%), and the lack of reliable childcare (18%) are making parenthood feel out of reach.

- **Healthcare**
 - Health barriers like **poor general well-being (15%), infertility (13%), and limited access to pregnancy-related care (14%)** add further strain.
 - Many are also holding back due to **growing anxiety about the future**—from climate change to political and social instability—whereas 19% faced partner or family pressure to have fewer children than they personally wanted.
- **Adolescent fertility rates**
 - India’s adolescent fertility rate remains high at **14.1 per 1,000 women aged 15–19** in comparison to countries like China (6.6), Sri Lanka (7.3), and Thailand (8.3).
 - This high rate of fertility amongst adolescents **endangers both maternal and child health** and affects education and employment outcomes.
- **Regional variations**
 - **In 31 states and UTs, fertility has dropped below the replacement level (2.1);** however, it is **still high in Bihar (3.0), Meghalaya (2.9), and Uttar Pradesh (2.7).**
 - Seven states have not yet achieved replacement TFR in rural areas, and **urban-rural gaps still exist.**
 - State-level differences in **Total Fertility Rate (TFR) and Total Wanted Fertility Rate (TWFR)** for two high fertility states—**Bihar (TFR 3.0; TWFR 2.2) and Meghalaya (TFR 2.9; TWFR 2.2)**—show gaps between wanted and actual fertility. In contrast, states with low fertility, like **Sikkim, have a relatively smaller variation (TFR 1.0 and TWFR: 0.91.0).**

Key Recommendations of the Report

- **Healthcare:** Expanding sexual and reproductive health services with **universal access to contraception, safe abortion, maternal health, and infertility care.**
- **Structural reforms:** Removing structural barriers by **investing in childcare, education, housing, and workplace flexibility.**
- **Inclusivity:** Promoting inclusive policies extending services to **unmarried individuals, LGBTQIA+ persons, and other marginalised groups.**

United Nations Population Fund (UNFPA)

- The United Nations agency for **sexual and reproductive health**, UNFPA, was founded in 1967.
- The **goal of UNFPA** is to create a world in which every young person’s potential is realised, every pregnancy is desired, and every delivery is safe.
- The United Nations Population Fund was formally renamed the United Nations Fund for Population Activities (UNFPA) in 1987. The original UNFPA acronym was kept, though.
- The **headquarters** of UNFPA is located in **New York City, USA.**

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding State of World Population (SOWP) Report:

1. It was published by United Nations Publication Fund (UNFPA)
2. As per report, India’s population is highest in the world
3. Total Fertility Rate (TFR) for India declined to 1.9, falling below the replacement level of 2.1.

How many of the statements given above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Answer: (c)

GLOBAL TRENDS REPORT

Why in News: The United Nations High Commissioner for Refugees (UNHCR) recently published its Global Trends Report.

Key details of the report

- At the end of 2024, an estimated **123.2 million (around 49 million children) people worldwide were forcibly displaced** due to persecution, conflict, violence, human rights violations and events seriously disturbing public order.
- Among those, the number of **internally displaced people jumped by more than 9% to 73.5 million** at the end of last year.
- Around **36.8 million are refugees, 8.4 million are asylum-seekers and 5.9 million are other people** in need of international protection.
- **69% refugees originate from** just five countries, namely **Venezuela, Syria, Afghanistan, Ukraine, and South Sudan.**
- **37% refugees are hosted in** five countries, namely **Iran, Turkey, Colombia, Germany, and Uganda.**
- Between 2018 and 2024, an average of **337,800 children were born as refugees per year.**
- **More than 1.6 million refugees returned to their countries of origin** during 2023 while 188,800 were resettled (with or without UNHCR’s assistance).
- **Low- and middle-income countries host 73% of the world’s refugees** and other people in need of international protection. The Least Developed Countries provide asylum to 23% of the total.

Educational Attainment, Health and Survival, and Political Empowerment.

- The index uses a **score between 0 and 1**, where 1 denotes complete parity.
- The 2025 edition, the 19th iteration of the report, covers 148 economies.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. The Global Gender Gap Index 2025 is released by which of the following?

- (a) UN Women
- (b) World Economic Forum (WEF)
- (c) World Bank
- (d) International Monetary Fund (IMF)

Answer: (b)

SIPRI REPORT 2025

Why in News: Nearly all of the nine nuclear-armed countries, including India and Pakistan, continued intensive nuclear modernisation programmes in 2024, upgrading existing weapons and adding newer versions, the Stockholm International Peace Research Institute (SIPRI), a global think tank, says in its 2025 report.

Overview of Nuclear Arsenals (SIPRI Report 2025)

- **Global Warheads:** As of January 2025, the SIPRI report estimated the total global nuclear warhead inventory at 12,241, with approximately 9,614 in military stockpiles for potential use.
- **Dominant Powers:** The United States and Russia collectively possess about 90% of the world's nuclear warheads. Russia has the largest military stockpile at 5,459, followed by the US with 5,177, including retired warheads.
- **Modernization Trend:** All nine nuclear-armed states (United States, Russia, United Kingdom, France, China, India, Pakistan, North Korea, and Israel) are heavily investing in modernizing their nuclear forces, upgrading existing systems, and introducing new technologies in 2024.
- **Reversal of Reduction:** Since the end of the Cold War, Russia and the US had generally dismantled more warheads than they deployed, leading to a slow reduction in global nuclear stockpiles. However, this trend may be reversing, with dismantlement slowing down and deployment of new warheads increasing.

- **China:** Has 600 nuclear warheads, with 24 deployed on missiles or operational bases.
- **India:** Possesses 180 nuclear warheads, an increase of eight from the previous year, showing a slight expansion in 2024.
- **Pakistan:** Has an estimated 170 nuclear warheads.

Global Arms Import Trends

- **Major Arms Recipients (2020–2024):** 162 states received major arms.
- **Top Five Importers:** Ukraine, India, Qatar, Saudi Arabia, Pakistan.
 - These five accounted for 35% of global arms imports.

Stockholm International Peace Research Institute (SIPRI)

- SIPRI is an **independent international institute** dedicated to research into conflict, armaments, arms control and disarmament.
- **Established in 1966**, SIPRI provides data, analysis and recommendations, based on open sources, to policymakers, researchers, media and the interested public.
- Based in Stockholm, SIPRI is regularly ranked among the most respected think tanks worldwide.
- **Vision:** SIPRI's vision is a world in which sources of insecurity are identified and understood, conflicts are prevented or resolved, and peace is sustained.
- **Mission**
 - To undertake research and activities on security, conflict and peace
 - To provide policy analysis and recommendations
 - To facilitate dialogue and build capacities
 - To promote transparency and accountability
 - To deliver authoritative information to global audiences
- **Statutes:** The Statutes are the guiding principles of SIPRI's work. They were adopted by the Swedish Government.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the Stockholm International Peace Research Institute (SIPRI):

1. SIPRI is an independent international institute dedicated to research into conflict, armaments, arms control, and disarmament.
2. SIPRI is primarily funded by the United Nations and is headquartered in Sweden.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Answer: (a)

PERFORMANCE GRADING INDEX (PGI) 2.0

Why in News: Chandigarh has been adjudged the best performer in school education for the academic year 2023-24, while Meghalaya appears in the lowest rung of the Performance Grading Index (PGI) 2.0 report released by the Union Ministry of Education.

About the Performance Grading Index (PGI) 2.0

- The Performance Grading Index (PGI) is an **evaluation framework developed by the Ministry of Education** to assess the quality of school education across States and Union Territories.
- It uses a **set of indicators** to measure performance and generates an index for in-depth analysis.
- The PGI 2.0 is **completely aligned with the Unified District Information System for Education Plus (UDISE +)**, National Achievement Survey (NAS), PM POSHAN portal, PRABAND portal, and Vidyanjali Portal data.
- It now enables automatically filling values of 65 indicators directly from the UDISE+ / NAS report so that States/UTs can focus on verifying values rather than repeating the data-filling exercise.
- The PGI structure comprises **total weightage of 1000 points across 73 indicators**, which are grouped under 2 Categories viz., Outcome and Governance & Management.
- The PGI 2.0 is constructed based on 73 indicators from 2 Categories containing **6 Domains**.
 - Learning Outcomes (LO) Domain
 - Access (A) Domain
 - Infrastructure & Facilities (IF) Domain
 - Equity (E) Domain
 - Governance Processes (GP) Domain
 - Teacher Education & Training (TE&T) Domain

Categories	Domain	Indicators	Total Weight
1. Outcomes	Learning Outcomes and Quality (LO)	12	240
	Access (A)	7	80
	Infrastructure & Facilities (IF)	15	19
	Equity (E)	16	260
1. Governance Equity (E) Management (GM)	Governance Processes (GP)	15	130
	Teacher Education & Training (TE&T)	8	100
Total		73	1000

Scores (% of total points)	Score range	Grade	Names of States/ UTs attaining the respective Grades	Total number of States/UTs
91% to 100%	941-1000	Daksh	None	NIL
81% to 90%	881-940	Utkarsh	None	NIL
71% to 80%	821-880	Atti-Uttam	None	NIL
61% to 70%	761-820	Uttam	None	NIL
51% to 60%	701-760	Prachesta -1	Chandigarh	1
41% to 50%	641-700	Prachesta -2	None	NIL
31% to 40%	581-640	Prachesta -3	Punjab, Delhi, Gujarat, Odisha, Kerala, DNH&DD, Haryana, Goa, Maharashtra & Rajasthan	10
21% to 30%	521-580	Akanshi-1	Puducherry, Himachal Pradesh, A&N Islands, Andhra Pradesh, Tamil Nadu, Karnataka, Lakshadweep, West Bengal, Madhya Pradesh, Sikkim, Uttar Pradesh, Jammu & Kashmir, Uttarakhand & Ladakh	14
11% to 20%	461-520	Akanshi-2	Telangana, Assam, Jharkhand, Tripura, Manipur, Chhattisgarh, Bihar, Nagaland, Mizoram & Arunachal Pradesh	10
Up to 10%	401-460	Akanshi-3	Meghalaya	1

Significance of Performance Grading Index (PGI) 2.0

- **Foundational for Improvement:** PGI 2.0 acts as a foundational assessment tool for intervention and mid-course correction in school education across States/UTs. It helps identify specific interventions needed for transformational changes, aligning with National Education Policy (NEP) recommendations and Sustainable Development Goals (SDGs). Its architecture supports regular monitoring of indicators to develop a quick response system for course correction.
- **Enhanced Comparability:** It addresses the previous difficulty in comparing state performances by converting complex assessments into a simple system with a common grading scale.
- **Qualitative Measurement & Equity Focus:** PGI 2.0 assigns significant weight (600 points) to qualitative indicators such as Learning Outcomes, Equity, and Teacher Education & Training, allowing for a more qualitative measurement of school performance. It has also contributed to a reduction in inter-State performance disparity over the years, decreasing the maximum deviation in scores from 51% in 2017-18 to 41% in 2023-24.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. The Performance Grading Index (PGI) 2.0, which assesses the performance of school education systems across States and Union Territories, is released by which of the following?

- Department of School Education & Literacy
- Pratham Foundation
- National Council of Educational Research and Training (NCERT)
- Central Board of Secondary Education (CBSE)

(a) Answer

RBI ANNUAL REPORT

Why in News: Driven by strong income growth, particularly on account of robust earnings from foreign sources, the Reserve Bank of India's (RBI) balance sheet expanded by 8.2% to Rs 76.25 lakh crore in the year 2024-25.

Highlights of the Report

- **RBI's Balance Sheet Expansion and Key Drivers (FY24–FY25):** The RBI's balance sheet grew by 11.08% to ₹70.48 lakh crore as of March 31, 2024. It also normalised to pre-pandemic levels and constituted 24.1% of India's GDP at the end of March 2024, up from 23.5% in March 2023. The balance sheet further expanded by 8.20% year-on-year, reaching ₹76.25 lakh crore as of March 31, 2025.

- The increase on the assets side was primarily due to a **significant rise in gold holdings (52.09%), domestic investments (14.32%),** and foreign investments (1.70%).
- Expansion on the liabilities side was attributed to increases in notes issued (6.03%), revaluation accounts (17.32%), and other liabilities (23.31%).
- **Global Economic Trends (2024–25):** The global economic expansion steadily continued in 2024, although growth was uneven amidst geopolitical tensions, geoeconomic fragmentation, heightened trade tensions and elevated public debt.
 - Inflation moderated with softening commodity prices, improved supply conditions, and delayed effects of 2022 monetary tightening.
 - Global growth in 2025 is expected to fall below the historical average of 3.7% and also below 2024's 3.3%, driven by policy uncertainty and protectionism.
- **India's Economic Performance:** Amidst challenging global economic environment, the Indian economy exhibited resilience during 2024-25, supported by robust macroeconomic fundamentals and proactive policy measures.
 - The Indian economy is poised to sustain its position as the fastest growing major economy during 2025-26, supported by pickup in private consumption, healthy balance sheets of banks and corporates, easing financial conditions and the government's continued thrust on capital expenditure.
- **External Trade:** India's merchandise exports grew marginally by 0.1 per cent in 2024-25 as against a contraction of 3.1 per cent a year ago.
 - On the other hand, merchandise imports grew by 6.2 per cent during this period as against a contraction of 5.3 per cent a year ago.
 - Consequently, India's merchandise trade deficit widened to US\$ 282.8 billion during 2024-25 from US\$ 241.1 billion a year ago

Indian Economy Outlook: FY25 Performance

- **Consumption:** Private consumption rose by 7.6%, largely driven by rural India (e.g. two-wheelers, tractors) due to a good farming season, while city spending cooled.
- **Government Spending:** Government spending grew by 3.8%, which was slower than the 8.1% growth observed in the previous year.
- **Investments:** The share of investment in GDP slightly decreased from 32.6% in FY23 to 31.4% in FY24, mainly due to foreign investor pullbacks. Investment growth also slowed further in FY25, with spending on infrastructure and machinery rising only 6.1% (down from 8.8%).
- **Savings:** Households saved approximately 30% of their disposable income, with net household financial savings increasing to 5%.

- **Agriculture:** FY25 was a recovery year for agriculture, thanks to a timely and generous monsoon that helped refill reservoirs. This led to increased planting areas for foodgrains and oilseeds, resulting in record foodgrain output. The government also supported farmers by hiking Minimum Support Prices (MSPs) to ensure at least 50% more than the cost of production.
- **Industrial and Services Sectors:** Industrial growth slowed to 4.3% from 11% due to cooling manufacturing. The services sector also lost some momentum initially, although it improved later in the year.
- **Inflation**
 - Headline inflation dropped to 4.6% in FY25 from 5.4% the year before.
 - However, food inflation remains vulnerable to recurring supply shocks, which is hindering a quicker alignment of headline inflation with the target.
 - The RBI expresses greater confidence in the durable alignment of headline inflation to the 4% target over a 12-month horizon, aided by easing supply-chain pressures, softening global commodity prices, and higher agricultural production due to above-normal southwest monsoon.
- **Job Market:** The Labour Force Participation Rate (LFPR) and Worker Population Ratio (WPR) reached record highs, partly due to increased women's participation in the workforce. Urban unemployment dipped, although rural joblessness saw a slight increase.

growing risk of drought, as **rising temperatures alter rainfall patterns and accelerate evaporation, reducing freshwater availability.** With 4°C of warming, droughts could become up to seven times more frequent and intense compared to pre-industrial times.

- **Growing risk to ecosystem:** By degrading land, droughts also accelerate desertification and contribute to biodiversity loss. **Since 1980, 37% of global land has experienced significant soil moisture loss,** while water levels in many rivers and aquifers globally are in decline. Agriculture is the most vulnerable sector, with crop yields falling by up to 22% in particularly dry years.
- **Economic toll:** As droughts intensify, their economic toll is rising. The cost of a drought episode today is **at least twice as high as in 2000,** and costs are projected to increase by 35% to 110% by 2035.
- **Community risks:** Droughts are responsible for **34% of disaster-related deaths and exacerbate poverty, inequality, and displacement.**

Key Policy Recommendations

- **Investing in drought resilience:** Every dollar invested in drought resilience can yield up to ten dollars in economic returns. This means that, with the right policies and investments, governments can reduce the immediate impacts of drought while also delivering long-term returns.
- **Water management:** Strengthening the resilience of water supply and storage systems and protecting ecosystems that serve as vital water sources is key to ensuring lasting water security in a changing climate.
- **Forest conservation:** Healthy ecosystems and sustainable land management play a critical role in retaining soil moisture, regulating water cycles, and enhancing resilience at the landscape level. For example, conserving forests and wetlands supports groundwater recharge and helps buffer against drought impacts.
- **Climate-resilient farming:** Shifting from traditional surface irrigation to more **efficient sprinkler or drip systems could reduce global water use by 54% and 76%,** respectively. Drought-tolerant crops, such as the resilient maize varieties used in parts of sub-Saharan Africa, further reduce water demand while protecting yields and reducing vulnerability even in dry years.

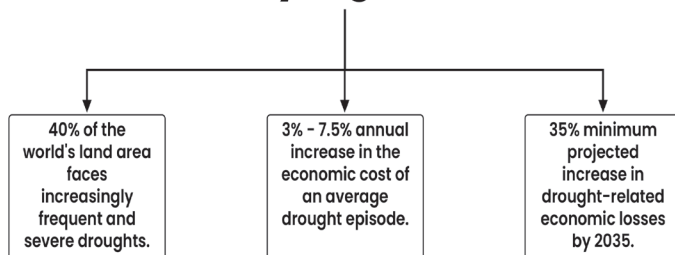
GLOBAL DROUGHT OUTLOOK

Why in News: The OECD's Global Drought Outlook assesses how countries can strengthen drought management to adapt to a changing climate.

Key Details

- The report provides new insights into the rising human, environmental, and economic impacts of droughts and offers practical policy solutions to minimise losses, build long-term resilience, and support adaptation to a drier future.

Key Figures



Key Challenges

- **Climate change:** Climate change is a key driver of this

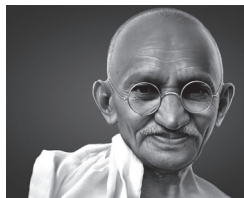
Key Global Initiatives

- **UNCCD's Drought Initiative:** This initiative focuses on shifting drought management from a reactive to a proactive approach by prioritizing prevention and preparedness. It aims to develop tools to boost drought resilience and help countries create strategic frameworks.

PERSONALITIES IN NEWS

MAHATMA GANDHI'S PHILOSOPHY IN TODAY'S WORLD

Why in News: An all-party delegation from India, during its visit to London, highlighted the continued relevance of Mahatma Gandhi's principle of non-violence, especially in the context of rising cross-border terrorism sponsored by Pakistan.



Satyagraha: The Core Philosophy of Mahatma Gandhi

- **Meaning:** Satyagraha is a compound of two Sanskrit words: "satya" (truth, from "sat" meaning being) and "agraha" (firm grasping, devotion to, or unwavering search for). Thus, it means **devotion to truth**, remaining firm on truth, and actively but nonviolently resisting untruth.
- **Purpose and Aim:** Satyagraha is a **moral weapon** that emphasises soul force over physical force. Its primary aim is to **win over an opponent through love and patient suffering, converting and healing them** rather than crushing, punishing, or seeking revenge.

Three Pillars of Satyagraha

- **Truth (Satya)**
 - **Gandhi's Definition:** Gandhi defined truth as "**what the Voice within tells you**" and "what a pure heart feels at a particular time," which can be understood as **obedience to one's conscience**.
 - **Relativity of Truth:** Gandhi acknowledged that "what may be truth for one may be untruth for another" due to differing human evolution and understanding. Therefore, **mutual toleration is the "golden rule of conduct"**. Despite this, he believed in a ceaseless effort to discover the absolute truth, which he equated with God.
 - **Pursuit of Truth:** For Gandhi, discovering truth required patient endeavour and silent prayer, and a consuming conviction burnished by the fire of a pure life. The true Satyagrahi must be **free from self-interest, prejudice, or momentary emotion**, deeply convicted after long and humble self-searching. The experiment leading to the right to speak of one's truth includes vows of truth, purity, non-violence, poverty, and non-possession.

Non-Violence (Ahimsa)

- **Total Non-Violence:** Ahimsa means more than just the avoidance of physical violence; it implies **total non-violence, encompassing words and even thoughts**. The intention never to do violence must be controlling.
- **Non-Violence of the Strong:** Gandhi emphasised that non-violence is for the strong, not the weak or cowardly. Non-violence presupposes the ability to strike. It is a conscious, deliberate restraint put upon one's desire for vengeance. **Cowardice, for Gandhi, was "the greatest violence"**. He believed true non-violence is **impossible without unadulterated fearlessness**, and that violent resistance is preferable to cowardly submission in the face of injustice.
- **Distinction Between Evil and Evildoer:** A Satyagrahi must always distinguish between evil and the evildoer, **harbouring no ill-will or bitterness against the latter**. They should not use needlessly offensive language or attack character, as the purpose is always to convince, correct, and reconcile, not to coerce. Gandhi's non-cooperation was rooted in love, not hatred, with the belief that there is no one so fallen in this world but can be converted by love.
- **Self-Suffering (Tapasya)**
 - **Voluntary and Ennobling:** It involves voluntarily accepting suffering without inflicting it on others. Gandhi saw it **not as valuing life low, but as noble and morally enriching**, leading to the "least loss of life" in the long run.
 - **Purpose:** Self-suffering **demonstrates sincerity and aims to melt the opponent's heart, awakening their conscience**. It is an active instrument of resistance, not passive. For Gandhi, suffering is infinitely more powerful than the law of the jungle for converting the opponent and opening his ears, which are otherwise shut to the voice of reason.

Satyagraha in Practice (Methods and Applications)

- **Civil Disobedience and Non-Cooperation:** These were direct methods to challenge unjust laws and authorities. For instance, Gandhi initiated civil disobedience campaigns against the Rowlatt Acts and the Salt Act. He emphasised that such disobedience must be open and nonviolent.
- **Constructive Service:** Gandhi's program was more than

just resisting British rule; it encompassed numerous constructive movements within Indian life, which he viewed as essential for winning freedom.

- **Abolition of Untouchability:** He relentlessly fought against untouchability, considering it a “curse” and believing that India could not achieve freedom (“Swaraj”) with its “poison” corroding the national body.
- **Hindu-Muslim Unity:** Gandhi deeply valued Hindu-Muslim friendship as vital for India’s freedom. He sympathised with the Khilafat movement, mobilising non-cooperation on behalf of Muslim concerns, seeing it as a step towards reconciliation and national unity.
- **Prohibition Movement:** He strongly opposed alcoholic beverages, encouraging women to agitate against their sale and to offer loving service to those struggling with drink.
- **Swadeshi and Khadi:** Swadeshi referred to the use of all home-made goods, especially those industries vital to prevent India’s pauperisation. Khadi was the homespun cloth, and Gandhi urged every Indian to spin their own, placing it at the centre of the Satyagraha program.
- **Renunciation:** The principle of renunciation involves reducing oneself to zero in material matters. Gandhi adopted a life of extreme austerity, embracing poverty, minimal clothing and food, and physical comforts.
- **Exaltation of Means:** For Gandhi, means and ends were convertible terms; “As the means so the end”. There was no wall of separation between means and ends, and the realisation of the goal is in exact proportion to that of the means.

Relevance of Gandhi’s Satyagraha in Today’s World

- **Combating Violence and Terrorism**
 - Gandhi’s non-violence philosophy is extremely important today as the world grapples with terrorism and other forms of violence.
 - Satyagraha offers a **moral alternative to conflict**, aiming to resolve disputes by addressing their underlying causes, such as exploitation.
 - Given the prevalence of religious fundamentalism and racism, non-violent techniques are immediately needed.
- **Addressing Global Issues:** Satyagraha provides a practical technique to overcome **untruth with truth and violence with non-violence**. Gandhian ideology, particularly Satyagraha, offers solutions for a range of contemporary global issues, including:
 - Human rights
 - Sustainable development and environmental concerns such as global warming, climate change, and resource depletion
 - Socio-political upheaval and instability

- War and peace
- Terrorism
- Political and administrative corruption

- **Promoting Social Change and Justice**

- Satyagraha serves as a powerful method for direct action in modern politics.
- It functions as an instrument for fighting evil and injustice, promoting positive objectives, and driving fundamental societal change.
- It can act as a crucial check on the abuse of power and an effective medium for educating public opinion.

- **Promoting Peace and Reconciliation**

- **Post-Conflict Healing:** Satyagraha can play an important role in healing after conflict. It encourages forgiveness, understanding, and rebuilding trust between people or communities that have been divided.
- **Interfaith Harmony:** Gandhi believed in respecting all religions. His ideas help promote peace and unity in today’s diverse and multicultural societies, where religious tolerance is more important than ever.
- **Youth Engagement:** Satyagraha teaches young people the value of truth, discipline, and peaceful ways to bring about change. It inspires them to become responsible and active citizens who work for a better society.

Conclusion

Gandhi’s ideas and philosophies continue to guide and inspire leaders and ordinary people worldwide. The world, facing numerous complex issues, **stands to benefit greatly from incorporating Gandhian philosophy into all aspects of life and administration**. The core Gandhian ideologies are essential for a **happy, prosperous, healthy, peaceful, and sustainable future** for every individual. Modern initiatives in India, such as **Swachh Bharat Abhiyan and AtmaNirbhar Bharat**, reflect Gandhi’s emphasis on sanitation and Swadeshi. The world increasingly needs tolerant individuals who accept diverse faiths and religions, a principle central to Gandhism.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. What are the key pillars of Satyagraha? How does Gandhian Satyagraha provide an alternative to violence for resolving contemporary global conflicts? [250 words] [15 marks]

JUSTICE ABHAY S. OKA

Why in News: Justice Abhay Sreenivas Oka recently retired from the Supreme Court after serving a tenure of 3 years and 9 months.

Career as a Judge

- He was appointed as an Additional Judge of the Bombay High Court in August 2003.
- He became a **Permanent Judge in May 2005 and served at the Bombay High Court for over 13 years.**
- He was appointed Chief Justice of the Karnataka High Court in May 2019, serving until August 2021.
- He was **elevated as a Supreme Court Judge in August 2021.**
- His elevation was a hard-won victory for judicial merit, coming after a prolonged standoff led by former Supreme Court judge Justice Rohinton Fali Nariman, who insisted on his elevation.

Key Contributions and Notable Judgments

- **High Court Tenure**
 - He passed numerous orders **related to environmental protection and improving living conditions in Bangalore and Bombay.**
 - In a case pertaining to vaccinations, he authored a judgment directing the state government to prioritise individuals with disabilities according to **Section 25 of the Rights of Persons with Disabilities Act, 2016**, and provided guidelines to authorities
 - The Karnataka High Court, under Chief Justice Oka, **took suo moto cognisance of monkey deaths in Belur Taluk**, emphasising the need for guidelines to prevent animal cruelty.
- **Supreme Court Tenure**
 - **Desertion by Spouse:** In *Debananda Tamuli v. Kakumoni Katakya*, with Justice Ajay Rastogi, he concluded that desertion depends on specific facts and evidence of each case.
 - **Gratuity for Anganwadi Workers/Helpers:** In *Maniben Maganbhai Bhariya v. District Development Officer Dahod*, with Justice Ajay Rastogi, he emphasised the importance of their grassroots work and held that **Anganwadi workers/helpers are entitled to gratuity under the Payment of Gratuity Act, 1972.**
 - **Excommunication Rights (Dawoodi Bohra Community):** A Constitution bench he was part of referred the matter of the Dawoodi Bohra community's right to excommunicate members to a nine-judge bench hearing the Sabarimala reference.



- **Validity of All India Bar Examination (AIBE):** His bench upheld the validity of the AIBE in *Bar Council of India v. Bonnie Foi Law College*, stating that conducting the AIBE is within the 'parameters of law'. They also recommended guidelines for law students and graduates appearing for the exams.
- **J&K Delimitation:** A Division Bench comprising Justices S.K. Kaul and A.S. Oka dismissed the petition challenging the notifications for the delimitation of assembly constituencies in the Union Territory of Jammu and Kashmir (J&K). The judgment clarified it did not concern the validity of the Jammu & Kashmir Reorganisation Act, 2019.

Values Highlighted by Justice Oka

- **Judicial Integrity and Professional Honesty:** His integrity was evident even as an advocate. In *Chandrakant Govind Sutar v. M.K. Associates (2002)*, then-**Advocate Oka brought relevant precedents that went against his own client's case to the judge's attention**, leading to the petition's dismissal. Justice Khanwilkar praised his "sense of detachment" and duty to the court.
- **Upholding Constitutional Principles with Firmness:** He explicitly stated on his final day on the bench, "I always believed that a judge has to be very firm; a judge has to be very strict. And a judge should not hesitate to offend anyone. But I was harsh only for one reason. I wanted to uphold the principles laid down by our Constitution". This demonstrated his **commitment to constitutional fidelity over popularity or political accommodation.**
- **Commitment to Justice and Public Service:** He believed that the law must serve justice rather than perpetuate institutional convenience. This was exemplified by his decision to deliver 11 verdicts on his final working day, despite attending his mother's last rites just the day before.
- **Safeguarding Personal Liberty and Procedural Fairness:** Justice Oka consistently expressed concern about the judiciary's role in safeguarding liberty. He lamented that people were not getting bail even in magistrate-triable cases and had to approach the Supreme Court. He criticised the "protracted ritual" of bail hearings and warned that "a democratic country must not function like a police state".
- **Institutional Honesty and Self-Critique of the Judiciary:** He was one of the few sitting Supreme Court judges to openly critique the judiciary's institutional failures.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Justice Abhay S. Oka's career reflects values such as judicial integrity, constitutional fidelity, and commitment to justice over convenience. Discuss the key values demonstrated by him and examine how these can serve as guiding principles for public servants in a democracy. [150 Words] [10 Marks]

DEENDAYAL UPADHYAYA

Why in News: Recently the Union Minister of Agriculture and Farmers Welfare, Shri Shivraj Singh Chouhan addressed the National Memorial Symposium organized at the NDMC Convention Centre in New Delhi on the occasion of the 60th anniversary of Pandit Deendayal Upadhyaya Ji's philosophy of 'Integral Humanism'.

About Deendayal Upadhyaya

- Born on **25th September 1916 in Mathura, Uttar Pradesh**, Pandit Deendayal Upadhyaya was a **distinguished Indian politician, thinker, and ideologue**. He was closely associated with the Rashtriya Swayamsevak Sangh (RSS), **which he joined in 1937**, dedicating his life to the organisation's vision of national service.
- He gained early recognition when **he appeared for the civil services examination dressed in traditional dhoti-kurta and cap**, earning him the respectful title of "Panditji."
- In 1951, when **Shyama Prasad Mukherjee founded the Bharatiya Jana Sangh (BJS)**, the precursor to today's Bharatiya Janata Party (BJP), the RSS deputed Upadhyaya to help build and strengthen the new party.
- His exceptional organisational skills quickly elevated him to the **position of General Secretary of the party's Uttar Pradesh unit**, and eventually to the role of All-India General Secretary.
- **Following Mukherjee's death in 1953**, Upadhyaya emerged as the principal architect of the BJS, leading its expansion across the country. He served as General Secretary for over 15 years, shaping its ideological foundation and political strategy.
- A visionary who left a lasting imprint on Indian political thought, **his life was tragically cut short when he was assassinated on 11th February 1968**.



Theory of Integral Humanism

- At its core, Deendayal Upadhyaya's philosophy of **Integral Humanism emphasizes the unity and harmony between the different aspects of an individual, body, mind, intellect, and soul**, as well as the balance between the individual and society. It advocates holistic development that nurtures all these dimensions for true human fulfillment.
- A key element of this doctrine is the concept of the **four Purusharthas**, or fundamental goals of human life: Dharma (righteousness), Artha (economic well-being), Kama (desire), and Moksha (liberation). Integral

Humanism seeks a balanced pursuit of all four, rooted in ethical and cultural values.

- The underlying principle of Integral Humanism is the belief in a **single, unified consciousness**, which connects all beings and forms the spiritual foundation of human existence.

Relevance of Pandit Deendayal Upadhyaya's Integral Humanism in Contemporary Times

- **Need for a Holistic Development Model:** Despite decades of global development, poverty and inequality persist. Existing models have often been unsustainable or one-dimensional. Integral Humanism offers a balanced framework focused on both individual dignity and societal welfare, rooted in Indian cultural and ethical values.
- **Sustainable Use of Resources:** The philosophy advocates using natural resources at a rate that allows for replenishment, promoting harmony between humans and nature—a principle highly relevant in the era of climate change and ecological degradation.
- **Rights, Duties, and Social Harmony:** Integral Humanism balances individual rights with responsibilities toward society and the nation. It extends the scope of democracy beyond politics to include social and economic spheres, encouraging inclusive and duty-conscious citizenship.
- **Indian Ethos vs. Western Individualism:** Western models often emphasise extreme individualism, leading to social fragmentation. In contrast, Integral Humanism upholds traditional institutions like family and community, fostering social cohesion and moral responsibility.
- **Spiritual Ecology and Cultural Consciousness:** The Indian tradition of revering rivers, mountains, and natural elements reflects the need for spiritual and ecological harmony. Integral Humanism aligns material development with spiritual growth, making it uniquely suited to India's civilisational values.
- **Path to Inner and Societal Balance:** By integrating the self (Vyasthi), society (Samasthi), nature (Srishti), and the divine (Parameshti), Integral Humanism offers a roadmap for a development model that is not just economic, but ethical and spiritual.

Conclusion

Pandit Deendayal Upadhyaya's philosophy of **Integral Humanism offers a timely and indigenous alternative** to the dominant development paradigms. Rooted in Indian ethos, it provides a balanced framework that integrates economic growth with social harmony, ecological sustainability, and spiritual well-being. In a world grappling with fragmentation and materialism, this holistic vision remains deeply relevant **to shaping inclusive and ethical governance** in contemporary India.

- **Arya Samaj:** At a young age, Bismil was drawn to the teachings of the Arya Samaj and became a staunch follower. He joined the Arya Samaj Youth Association and actively spread the teachings of Swami Dayanand.
- His **ideals of freedom and revolution** were further ingrained after reading the death sentence of Bhai Parmanand, leading him to write his poem **Mera Janm** at just 18 years old.
- **Revolutionary Activities and Organisations**
 - He was involved in the **Mainpuri Conspiracy** of 1918, where police found him and other young people selling government-proscribed books. He managed to escape and go underground during the British crackdown.
 - In 1924, Bismil, along with Sachindranath Sanyal, Ashfaqullah, and Chatterjee, founded the **Hindustan Republican Association (HRA)**, which later became the Hindustan Socialist Republican Association (HSRA). The objective of the HSRA was to fight British colonial rule and achieve independence through armed rebellion if necessary.
- **Kakori Train Action**
 - Bismil was the mastermind behind the infamous Kakori Train Action, also known as the Kakori Conspiracy.
 - This **train robbery took place on August 9, 1925, near Lucknow**, with the aim of collecting funds to support their revolutionary activities.
 - During the action, Bismil, along with companions like **Ashfaqulla Khan, Sachindra Bakshi, and Rajendra Lahiri**, subdued the guard and looted cash meant for the treasury.
 - More than 40 people were arrested in connection with the incident.
 - After a trial, Bismil and his associates were found guilty of waging war against the British Empire and were sentenced to death.
 - Ram Prasad Bismil was hanged on December 19, 1927, at the age of 30, in Gorakhpur jail.

Contributions of Ram Prasad Bismil

- **Architect of Revolutionary Movements:** He was a key figure in forming and reorganising revolutionary organisations like the Hindustan Republican Association (HRA).
- **Strategic Planner:** He masterminded critical actions like the Kakori Train Action, which aimed to fund the revolutionary cause.
- **Inspirational Leader:** He inspired countless youth to join

the national movement through his courageous actions and leadership.

- **Profound Poet and Writer:** His patriotic poems and writings, under pen names like 'Bismil', 'Ram', and 'Agyat', instilled nationalist fervour and revolutionary spirit in people. His verses continue to inspire generations.

Values and Lessons from the Life of Ram Prasad Bismil

- **Unwavering Patriotism and Dedication:** Bismil's entire life was devoted to the cause of Indian independence.
- **Courage and Fearlessness:** Bismil was a fearless patriot who courageously participated in revolutionary activities and faced the consequences without flinching. He challenged colonial rule head-on, even if it meant risking his life.
- **Inspirational Leadership:** His actions and words inspired countless others to join the fight for freedom. He was a leader who motivated and rallied people towards a common goal.
- **Conviction in Ideals:** Bismil held strong convictions, even reportedly stating that "independence would not be achieved by means of non-violence," which contrasted with Mahatma Gandhi's approach. This demonstrates his firm belief in his chosen path for freedom.
- **Sacrifice and Selflessness:** Ultimately, Bismil's life culminated in his martyrdom, highlighting the ultimate sacrifice he made for the nation's freedom.

Conclusion

Ram Prasad Bismil was not just a revolutionary but a **symbol of fearless resistance, intellectual depth, and unwavering patriotism**. His contributions to India's freedom struggle through the formation of revolutionary organisations, bold actions like the Kakori Train Conspiracy, and inspiring literary works have left an indelible mark on India's history. His life serves as a reminder that the path to freedom often demands not only action but also conviction, courage, and sacrifice.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. Discuss the contributions of Ram Prasad Bismil to the Indian freedom struggle. In what ways did his revolutionary ideology and actions differ from the mainstream nationalist movement of the time? [150 Words] [10 Marks]

LOKMATA DEVI AHILYA BAI HOLKAR

Why in News: The 300th birth anniversary of Lokmata Devi Ahilya Bai Holkar was celebrated in Bhopal.

About Birsa Munda

- Birsa Munda, born on November 15, 1875, led a **movement known as 'Ulgulan' (The Great Rebellion) among the tribals of Jharkhand**. During this uprising in 1899, thousands of his followers proclaimed in their native language: "Diku Raj Tuntu Jana – Abua Raj Ete Jana", meaning "**The rule of outsiders is over, our own rule has begun.**" The British, threatened by this movement, resorted to brutal suppression.
- Revered today as Bhagwan (Lord) Birsa Munda, he was an **exceptional leader who recognised the impact of British rule on tribal traditions**. According to Vivek Aryan, a researcher at the Tribal Research Institute in Ranchi, Birsa Munda realised the erosion of tribal rights as a school student. His activism led to his **expulsion from school in 1890**. Determined, he began raising awareness among tribal communities, rallying them for their rights.
- By 1895, Birsa Munda had become a significant threat to the British, leading to his arrest on August 24, 1895, from Chalkad village. Historical records show that he **was sentenced to two years of rigorous imprisonment on November 19, 1895, under Section 505 of the Indian Penal Code**. After his release on November 30, 1897, the Munda tribes once again rallied under his leadership, setting the stage for a large-scale rebellion.



- The British, tipped off by informants, surrounded the hill with heavily armed forces. In the violent clash that followed, **around 400 tribals were killed, and the nearby Tajna River reportedly ran red with blood**. Though the British crushed the uprising, Birsa Munda managed to escape.
- However, **on February 3, 1900, he was arrested from the forests of Chaibasa** while asleep. He was secretly taken to Ranchi, tried in a mock trial, and imprisoned in Ranchi Jail, where he was subjected to brutal torture. On June 9, 1900, he died under mysterious circumstances, with British officials attributing it to cholera. His body was discarded near today's Distillery Bridge in Ranchi, where a memorial now stands.
- The Ranchi Jail has since been converted into the **Birsa Munda Smriti Sangrahalaya**, commemorating his martyrdom and contribution to India's tribal resistance movement.

Conclusion

Birsa Munda remains a powerful symbol of tribal resistance and indigenous assertion against colonial exploitation. His Ulgulan was not merely a revolt but a visionary struggle for tribal identity, land rights, and cultural dignity. Revered as Bhagwan by millions, his legacy continues to inspire movements for social justice, self-rule, and the empowerment of marginalised communities in India.

Ulgulan Movement and Birsa Munda's Revolt

- On December 24, 1899, Birsa Munda **launched the Ulgulan (meaning "Great Tumult") to assert tribal rights over jal, jungle, and zameen** (water, forest, and land). By January 1900, the rebellion had spread across the Chotanagpur region.
- The uprising reached its peak on January 9, 1900, **when thousands of Munda tribals, armed with traditional weapons, assembled at Dombari Buru hill**.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

- Q. Birsa Munda's Ulgulan was a significant tribal movement that challenged colonial rule and asserted indigenous rights. Discuss the socio-political impact of the movement and its relevance in contemporary India. [150 Words] [10 Mark]

ARTICLES FROM YOJANA (JUNE 2025)

OPERATION SINDOOR - INDIA'S STRATEGIC CLARITY AND CALCULATED FORCE

I. Background and Trigger for Operation SINDOOR

- **The Pahalgam Attack – April 22, 2025**
 - Pakistan-backed terrorists stormed a village in Pahalgam.
 - Attackers asked villagers their religion and killed 26 people.
 - The goal was to incite communal violence, marking a shift from typical cross-border terrorism to internal destabilization.
- **Religious Site Attacks**
 - Pakistan escalated through drone and artillery attacks on religious sites:
 - ◆ Shambhu Temple in Jammu
 - ◆ Gurdwara in Poonch
 - ◆ Christian convents
 - These were deliberate, coordinated attempts to fracture India's communal harmony.

II. India's Response – Operation SINDOOR Launched

- **Nature of Operation**
 - Declared on May 7 as a measured, non-escalatory, focused military response.
 - Targeted terror infrastructure, not civilian or unrelated military assets.
 - Reiterated that any attack on Indian military targets would invite decisive response.
- **Retaliatory Air Strikes**
 - **Key targets destroyed:**
 - ◆ Radar installations in Lahore
 - ◆ Radar facilities near Gujranwala
- **Ceasefire Announcement – May 10, 2025**
 - Pakistan's DGMO requested a ceasefire.
 - Both sides agreed to halt firing across land, air, and sea from 1700 hrs IST.
- **Post-Ceasefire Drone Incursions**
 - Despite the ceasefire, Pakistan sent UAVs into Indian civilian/military areas.

- Indian defence systems intercepted all intrusions.
- Field commanders were authorised to respond to any violations.

III. The Information Warfare Dimension

- **Pakistan's Propaganda Offensive**
 - Aggressive misinformation campaign launched by Pakistan post-attack.
 - **Intent:** Mislead international community, shift narrative, and justify aggression.
- **India's Digital Response**
 - Transparent communication of facts.
 - Exposed manipulative social media accounts from Pakistan.
 - Launched media literacy campaigns to help citizens identify fake news.
 - Maintained strategic calm and digital vigilance.

IV. Non-Military Measures and Strategic Diplomacy

(i) Water as Leverage – Suspension of Indus Waters Treaty

- **Termination of Treaty Signed in 1960**
 - Suspended until Pakistan irrevocably stops supporting cross-border terrorism.
- **Impact on Pakistan**
 - **Indus basin critical for:**
 - ◆ 80% of cultivated land
 - ◆ 93% of water use
 - ◆ Supports 237 million people, 25% of GDP
 - **Vulnerabilities:**
 - ◆ Mangla & Tarbela dams have only 10% live storage.
 - ◆ Disruption could lead to food shortages, power cuts, and industrial paralysis.
 - **Benefits for India**
 - ◆ Removes restrictions on Jhelum & Chenab.
 - ◆ Enables dam and reservoir construction in J&K, Ladakh, Punjab, and Haryana.
 - ◆ Boosts irrigation and hydroelectricity.
 - ◆ **Reinforces the national message:** "Blood and water cannot flow together."

(ii) Trade and Mobility Restrictions

- **Closure of Attari-Wagah Border**
 - Check post shut; crossings allowed only until May 1.
- **Trade Suspension**
 - Exports like onions stopped.
 - Imports of cement, textiles were banned.
 - Severely disrupted Pakistan’s fragile economy.
- **Deportation and Visa Revocation**
 - All Pakistani nationals deported.
 - SVES (SAARC Visa Exemption Scheme) suspended for Pakistanis.
- **Cultural Isolation**
 - Ban on Pakistani artists and content.
 - Streaming platforms barred from hosting Pakistani media.

(iii) Diplomatic and Intelligence Pressure

- **Pakistan’s Isolation on Global Forums**
 - Terror links publicly exposed.
 - Support gained from several countries.
- **Reduction of Diplomatic Presence**
 - Pakistan’s military advisors in India declared Persona Non Grata.
 - Embassy staff reduced from 55 to 30.

V. Strategic Leadership and Doctrine Shift

(i) Prime Minister Modi’s Leadership

- **Swift, Composed Decision-Making**
 - PM Modi, on a foreign visit, took immediate control.
 - Avoided emotional retaliation; emphasized strategic unpredictability.
- **Clarity of Objective**
 - Terrorism = war. No separation between terror groups and their state sponsors.
 - Decisive, ethical, and India-centric doctrine adopted.
- **Doctrine of Response**
 - Terror attack = Act of war
 - Nuclear blackmail won’t deter response
 - No distinction between state and non-state actors
 - Terror & talks / Terror & trade / Water & blood — cannot coexist
- **Public Address – May 12**
 - Operation SINDOOR represents justice and unity.
 - “We have always defeated Pakistan; this operation adds a new dimension.”

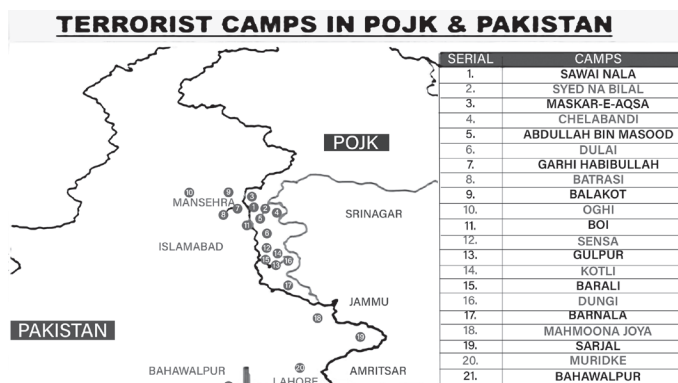
VI. Achievements of Operation SINDOOR

OPERATION SINDOOR

- Purpose of Operation SINDOOR**
 - Conceived to punish perpetrators and planners of terror.
 - Aimed to destroy terror infrastructure across the border.
- Intelligence and Target Selection**
 - Carried out a microscopic scan of the terror landscape.
 - Identified numerous terror camps and training sites.
- Operational Ethics and Restraint**
 - Operated under self-imposed restraint to avoid collateral damage.
 - Only terrorist targets were to be neutralized, avoiding civilian harm.

• **Nine Terror Camps Destroyed**

- In PoJK and Pakistan; over 100 terrorists were eliminated.



• **Deep Cross-Border Strikes**

- Targets hit in Lahore, Bahawalpur, Punjab, etc. New Strategic Red Line
- Terror as state policy = invites direct and forceful retaliation.

• **Dual Targeting**

- Both terrorists and their sponsors neutralised.

• **Exposed Pakistan’s Air Defence Flaws**

- Indian Rafale jets, SCALP and HAMMER missiles dodged Chinese-supplied defences.

• **India’s Air Defence Superiority**

- Hundreds of drones neutralised by the Akashteer system and other indigenous technologies.

• **Surgical Precision without Escalation**

- Avoided civilian and non-terror targets.

• **Elimination of High-Value Terror Commanders**

- **Targets included:**
 - ◆ Yusuf Azhar (IC-814 hijack)
 - ◆ Abdul Malik Rauf
 - ◆ Mudassir Ahmad (Pulwama links)

- **Airstrikes on 11 Pakistani Military Bases**
 - Destroyed 20% of Pakistan's air assets in 23 minutes.
 - Bholari Air Base suffered major losses.
- **Tri-Service Coordination**
 - Army, Navy, and Air Force functioned in synchronised strikes.
- **Strategic Autonomy**
 - India did not seek international approval; asserted right to self-defence.
- **Global Support**
 - Widespread international backing – a shift from usual calls for restraint.
- **Narrative Shift on Kashmir**
 - Global framing focused solely on counter-terrorism, not Kashmir politics.

VII. Conclusion: A Paradigm Shift in India's National Security Posture

- Operation SINDOOR was not just retaliation—it was a redefinition of India's strategic clarity.
- Showed zero tolerance, yet measured restraint.
- Combined military, diplomatic, economic, digital, and informational tools.
- **Sent an unambiguous message:**
 - "India will hit back – swiftly, surgically, and with complete moral clarity."
- The operation established a new deterrence doctrine, aligning India's internal unity with global leadership.

RISE OF ATMA NIRBHAR INNOVATION IN NATIONAL SECURITY

I. Context and Background: Operation SINDOOR as a Turning Point

- **Nature of Threat:**
 - A new pattern of asymmetric warfare is emerging, where terrorists now target civilians along with the military.
 - The Pahalgam attack in April 2025, which killed 26 people, marked a shift from cross-border attacks to communal destabilization tactics.
- **India's Strategic Response:**
 - Operation SINDOOR was a precise and calculated retaliation without crossing the LoC or international borders.
 - Emphasis was placed not just on tactical superiority, but also on self-reliant technological warfare capabilities.
- **Significance of the Operation:**
 - A landmark in indigenous defence capabilities, integrating advanced tech systems like drones, air defence networks, and electronic warfare.

II. Air Defence Capabilities: First Layer of Protection

- **Attack and Defence (May 7–8, 2025):**
 - Pakistan launched drones and missiles at key Indian military locations: Awantipora, Jammu, Srinagar, Amritsar, Chandigarh, Phalodi, Bhuj, and more.
 - These attacks were neutralised by India's Integrated Counter-UAS Grid and Air Defence systems.
- **Air Defence Mechanisms:**
 - Involved use of radars, control centres, artillery, and missile systems – both airborne and ground-based.
 - Indian forces retaliated by neutralising Pakistani Air Defence systems, including one in Lahore.

III. Performance of Air Defence Systems: Indigenous + Legacy Mix

- **Systems in Action:**
 - Battle-proven weapons: Pechora, OSA-AK, and LLAD guns.
 - **Indigenous highlight: Akash Missile System:**
 - ◆ Short Range Surface-to-Air Missile (SAM).
 - ◆ Engages multiple targets in autonomous/group mode.
 - ◆ Equipped with Electronic Counter-Counter Measures (ECCM).
 - ◆ Fully mobile weapon platform.
- **Synergized Operations:**
 - Army, Navy, and primarily Air Force integrated systems created a multi-domain, impenetrable defence shield.
 - Supported by IACCS (Integrated Air Command and Control System) for net-centric warfare.

IV. Offensive Precision: Surgical, Calibrated, and Indigenous

- **Targeted Strikes:**
 - **Hit Pakistani air bases:** Noor Khan and Rahim Yar Khan.
 - Used loitering munitions ('kamikaze drones') to destroy high-value assets.
- **Effectiveness of Offensive Measures:**
 - No loss of Indian assets.
 - Operation was completed in just 23 minutes.
 - Bypassed Chinese-origin air defence systems in Pakistan using advanced jamming and surveillance systems.

V. Evidence of Neutralised Enemy Technology

- **Technologies Recovered:**
 - Chinese-origin PL-15 missiles
 - Turkish-origin UAVs (Yiha/YEEHAW)
 - Long-range rockets, quadcopters, commercial drones

- **Implication:**
 - India successfully countered foreign-origin advanced weaponry through homegrown systems.

VI. Multi-Layered Defence: Coordination and Preparedness

- **Anticipated Retaliation:**
 - India expected Pakistan's reaction and activated layered defence systems across the border.
- **Defensive Configuration:**
 - **A mix of:**
 - ◆ Counter Unmanned Aerial Systems (CUAS)
 - ◆ Shoulder-fired weapons
 - ◆ Legacy and modern Air Defence Systems
- **Outcome:**
 - Pakistan's attempts to strike logistic installations and airfields on May 9-10 failed.
 - No significant civilian/military infrastructure damage occurred in India.
- **Government's Role:**
 - These systems were developed over a decade of sustained investment in defence indigenisation.

VII. ISRO's Strategic Role in National Security

- **Satellite Surveillance:**
 - ISRO operates at least 10 satellites for 24x7 monitoring of national security zones.
- **Geospatial Monitoring:**
 - Coverage of 7,000 km coastal areas and the entire northern region.
 - Satellites and drones are now essential to national defence and surveillance.

VIII. Rise of India's Indigenous Drone Industry

- **Drone Federation of India (DFI):**
 - Represents over 550 drone firms and 5,500 pilots.
 - Aims to make India a global drone hub by 2030.
- **Market Size:**
 - The Indian drone market is projected to reach \$11 billion by 2030, comprising 12.2% of the global market.
- **Government Incentives:**
 - PLI scheme launched in Sept 2021 for drones and components.
 - Budget of ₹120 crore, covering FY 2021–22 to FY 2023–24.
- **Future Direction:**
 - Focus on AI-driven autonomous drones.

- Integration of AI-based decision-making into drone warfare.

IX. India's Defence Manufacturing Revolution

- **Export and Production Growth:**
 - Defence exports in FY 2024–25 reached ₹24,000 crore.
 - **Target:** ₹50,000 crore by 2029.
 - **Indigenous production in FY 2023–24:** ₹1.27 lakh crore.
- **'Make in India' Success Stories:**
 - **Platforms developed:**
 - ◆ **Artillery:** Dhanush, ATAGS
 - ◆ **Armour:** Arjun MBT
 - ◆ **Aircraft & UAVs:** LCA Tejas, ALH, LUH
 - ◆ **Missile Systems:** Akash
 - ◆ **Naval Vessels:** Destroyers, Submarines, IACs, OPVs
- **Government Backing:**
 - iDEX (Innovations for Defence Excellence)
 - SRIJAN initiative (Indigenisation)
 - Defence Industrial Corridors (Uttar Pradesh & Tamil Nadu)
 - Major procurements like LCH Prachand and ATAGS.
- **Vision 2047:**
 - **Goal:** World's largest defence exporter by 2047.
 - **Intermediate target:** ₹3 lakh crore production and ₹50,000 crore exports by 2029.

X. Conclusion: From Tactical Strike to Strategic Transformation

- **Operation SINDOOR as a Milestone:**
 - Not just a military success, but a validation of India's defence innovation and Atma Nirbhar Bharat policies.
- **Technology at Core of National Security:**
 - Indigenous systems in air defence, drones, counter-UAS, and net-centric operations played a decisive role.
- **Fusion of Sectors:**
 - Collaboration between private innovation, public execution, and military leadership formed the backbone of this operation.
- **India's Future-Ready Posture:**
 - Operation SINDOOR demonstrates that India is prepared for modern warfare.
 - Equipped with homegrown technology, political will, and a vision for global leadership in defence.

ARTICLES FROM KURUKSHETRA (JUNE 2025)

COOPERATIVES AND FOOD SECURITY – A GAME CHANGER FOR INDIA

I. Introduction: India's Unique Food Security Challenge

India's Demographic and Agricultural Contrast

- India has **11% of the world's cultivable land** (16 crore hectares) but needs to feed **18% of the global population** (140 crore people out of 790 crore globally).
- This indicates an **imbalance between food production capacity and consumption needs**.

Current Production and Storage Scenario

- **Food grain production in India (2021):** 311 million metric tonnes (MMT).
- **Storage capacity:** Only 145 MMT.
- **Deficit:** 166 MMT (a 47% shortfall in storage infrastructure).
- Countries elsewhere can store up to 131% of their food production;
- India struggles with post-harvest losses and poor distribution systems.

Government's Response (2023)

- Launch of the **World's Largest Grain Storage Plan in the Cooperative Sector**.
- **PACS (Primary Agricultural Credit Societies)** identified as **key enablers**.
- Plan aims to **diversify PACS functions** and empower them with services like inputs, credit, and infrastructure.

II. The Untapped Potential of the Cooperative Sector

Presence and Reach

- India has over **1.1 lakh PACS**.
- They represent around **130 million farmers**.

Cooperatives as Service Providers

- **Provide services in:**
 - Input delivery
 - Market access
 - Storage
 - Training and technology
- **Notable examples:**
 - **Tamil Nadu:** 94% of PDS shops run by cooperatives.

- **Amul:** Transformed India into the largest milk producer.
- **Mother Dairy:** Ensures affordable dairy and vegetables.
- **Maharashtra:** Grain banks by Academy of Development Studies provide loans in grain form.

Buffer Stock Management

- **NAFED** maintains buffer stocks of onions, pulses, etc.
- Cooperatives can help create **centralized procurement and storage systems**.

Operational Gaps

- **Issues with PACS:** Poor management of storage, limited technical expertise.
- **Government response:** Vision of 'Sahakar-se-Samridhi' (Prosperity through Cooperation).
- Plan for PACS diversification and modernization.

III. Food Storage in India – A Broken Backbone



Infrastructural Issues

- **Food Corporation of India (FCI) godowns suffer from:**
 - Poor maintenance
 - Grain deterioration

- High costs
- Over-targeting of grains
- **Estimated losses:** 10-15% of total grain, equating to ₹90,000 crores annually.

Need for Cooperative-led Storage Governance

- **A cooperative-based model offers:**
 - Risk mitigation
 - Reduced losses
 - Community ownership

IV. PACS & Food Security: The New Roadmap

New Storage Initiative (2023)

- **Investment:** ₹1.25 lakh crore
- **Target:** 700 lakh tonnes of storage over 5 years
- **Reach:** 67,000 functional PACS to be involved.

Strategic Goals

- Reduce **post-harvest losses**
- Address **transportation inefficiencies**
- Enable **local storage**
- Empower PACS as **direct procurement agencies**
- Improve **MSP procurement access** and **farmer income**

Progress Indicators

- **Godown construction** began in **11 PACS** across **11 states**.
- **Foundation stones** laid in **500 more PACS**.
- **576 PACS** initiated construction under specifications.
- **Computerization** done in **67,930 PACS**; **43,658** fully operational.

Scheme Convergence

- **Merging support from:**
 - AIF
 - AMI
 - SMAM
 - PMFME
- **Additional support from:**
 - **PM-KISAN:** income support
 - **PMFBY:** crop insurance
 - **e-NAM:** digital market access

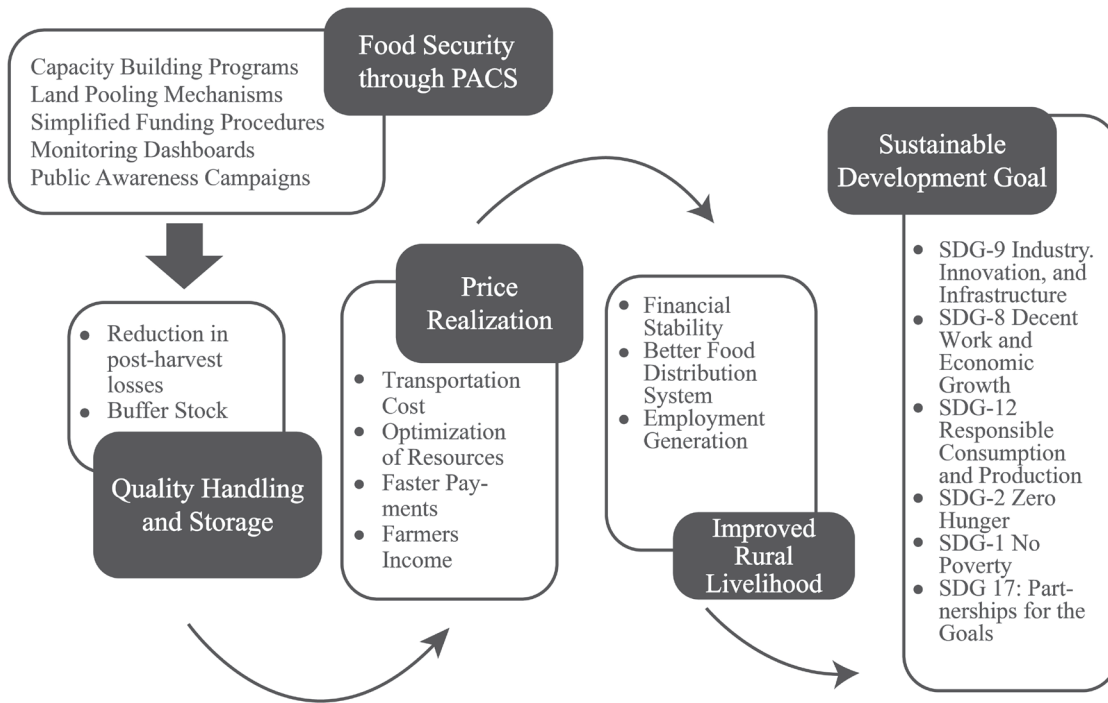
V. Governance and Institutional Framework for PACS

Supporting Schemes and Institutions

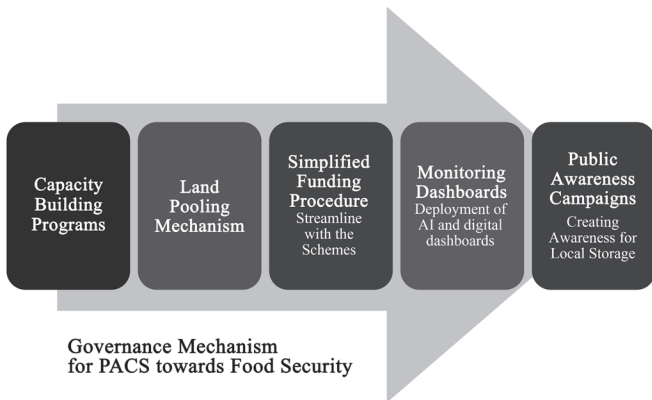
- **AIF (Agricultural Infrastructure Fund):**
 - **Launched:** May 2020
 - **Outlay:** ₹1 lakh crore
 - Offers 3% interest subvention up to ₹2 crore for 7 years.
- **AMI:** 33% subsidy for PACS storage buildings.
- **NABARD:** Additional 1% interest subvention for PACS.
- **Other stakeholders:**
 - National Cold Chain Scheme
 - NCDC
 - Grameen Bhandaran Yojana

Implementation Challenges

- **Coordination bottlenecks** among government agencies, cooperatives, and banks.
- Issues with **timely fund disbursement** and **land availability**.
- Requires a **single-window mechanism** under the **Ministry of Cooperation**.



VI. Capacity Building and Land Pooling



Training Needs

- Focus on:**
 - Inventory management
 - Digital procurement
 - Grain quality
 - Regulatory compliance
- Objective:** Build a cadre of professional community-level managers.

Land Pooling

- Vital in densely populated areas.
- Land for godowns must be pooled via **Panchayats** for smooth construction and expansion.

VII. Financial Planning and Risk Management

Assessing Absorption Capacity

- PACS must prepare **financial roadmaps** to ensure **sustainability after government support ends.**

Simplified Funding Instruments

- Tools provided:**
 - Subsidies
 - Interest subvention
 - Credit guarantees
- PACS must also manage:**
 - Governance risks
 - Operational uncertainties
 - HR and accountability mechanisms

VIII. Monitoring via Digitalisation and AI

Use of Technology

- Computerization ensures dashboard-based monitoring of:**
 - Storage capacity
 - Procurement data
 - Financial tracking
- AI tools support **data-driven governance** and **smart storage management.**

Institutional Monitoring Mechanism

- Inter-Ministerial Committee (IMC):** Central-level oversight.
- State Cooperative Development Committees:** State-level implementation.
- District Cooperative Committees:** Grassroots monitoring.

IX. Farmer Participation and Awareness

Need for Engagement

- Farmers must be **aware of their roles** in storing and managing grain.
- **Public awareness campaigns** are crucial to ensure maximum engagement.

X. Impact on Food Security

Core Elements of Food Security

- **Buffer stock** maintenance
- **Public Distribution System (PDS)** management

Anticipated Outcomes

- Reduced **post-harvest losses**
- Better **quality handling** and **price realization**
- Improved **rural livelihood**
- **Achievement of SDGs:**
 - Zero Hunger
 - Sustainable Agriculture
 - Economic Empowerment

Technological Integration

- Use of **online procurement platforms** by PACS.
- Creation of **community-level, quality-controlled storage networks**.

XI. Conclusion and Way Forward

Transformational Potential

- The **World's Largest Grain Storage Plan** is a **game changer** in food security policy.
- By decentralizing storage, it brings **storage closer to farmers** and reduces reliance on centralized systems.

Role of PACS

- PACS to evolve into **multifunctional cooperatives**.
- They will
 - Manage procurement
 - Reduce grain losses
 - Enhance farmer income
 - Promote rural entrepreneurship

Challenges and Solutions

- **Land pooling, fund disbursement, and stakeholder coordination** must be resolved.
- Strong **institutional support** and **timely interventions** are crucial.

Vision for the Future

- With continued **government backing**, enhanced **technology integration**, and active **community participation**, this initiative has the potential to:
 - Revolutionize food grain storage
 - Enhance India's food security
 - Uplift farmers' livelihoods in a sustainable and inclusive manner

BUILDING A RESILIENT COOPERATIVE SECTOR

I. Introduction: The Dual Mandate of Cooperatives

- **Cooperatives are ambidextrous institutions, balancing two roles:**
 - **Protecting member interests:** Generally small equity holders facing livelihood stress.
 - **Competing in the market:** Must function as competitive business units.

Cooperatives link capitalism (business operation) and socialism (member welfare).

- **Serve as aggregators of:**
 - Small assets
 - Traditional skills
 - Inherited production processes
 - Local services
- Governed by members themselves (user-owned firms), not external investors.
- Need to develop entrepreneurial, governance, leadership, managerial, and technical skills.
- Must become globally competitive while leveraging local inputs.

2. Global Perspectives on Cooperatives and Skill Development

International Cooperative Alliance (ICA) and World Data

- 12% of the world population is part of **3 million cooperatives**.
- Top 300 cooperatives report turnover of USD 2,409.41 billion (World Cooperative Monitor 2023).
- 280 million people employed through cooperatives (10% of global workforce).

International Labour Organization (ILO) Perspectives

- 50% of global agricultural output is marketed via cooperatives.
- **ILO Recommendation 193:** Promote cooperatives through education and training.
- **ILO emphasizes:**
 - Job creation
 - Poverty reduction
 - Social inclusion
 - Decent work environment
- Supports green jobs (sustainable agriculture, eco-tourism, etc.).
- **Advocates:**
 - Vocational training
 - Upskilling/reskilling
 - Tools like THINK.COOP, START.COOP, MANAGE.COOP, MY.COOP

Committee for the Promotion and Advancement of Cooperatives (COPAC)

- Multi Stakeholder partnership supporting sustainable cooperatives.
- Advocates skill investment across cooperative ecosystems.
- Works with ILO, FAO, ICA to support skill-based cooperative development.
- Champions 2025 as **International Year of Cooperatives (IYC)**.

United Nations Skill Policy and SDGs



- **Skilling supports SDGs:**
 - SDG 1 (Poverty reduction)
 - SDG 4 (Quality education)
 - SDG 8 (Decent work)
 - SDG 10 (Reduced inequality)
 - SDG 12 (Sustainable consumption)
- **Focus areas:**
 - Literacy
 - Youth employment
 - Innovation
 - Entrepreneurship

ICA(International Cooperative Alliance)'s Role

- **in Skill Promotion** Founded in 1895, ICA represents 1 billion members across 107 countries.
- ICA-AP promotes cooperative development in Asia-Pacific.
- **ICA initiatives:**
 - Coopathons (youth and women involvement)
 - ICA CCR (cooperative research)
 - ICA ICEI (education integration)
- Holds consultative status with UN ECOSOC.



3. Emerging Global Challenges in Cooperative Skilling

- **Skill mismatch:** Member skills vs. market demand.
- **Technological disruption:** Automation, AI.
- Digital literacy gaps.
- Relevance in Industry 4.0 standards.
- **Soft skill gaps:** Governance, leadership.
- Need for lifelong learning.
- Most members are marginal producers with livelihood stress, limited awareness.
- **Calls for:**
 - Awareness programs
 - Skilling infrastructure
 - Collective production asset base
 - Professional management in cooperatives

Educational Gaps Globally

- Cooperative education lacks global standardization.
- **Notable institutions:**
 - Mondragon University (Spain)
 - Cooperative universities in **Kenya, Tanzania, Africa**
 - University of Colombia (circular economy focus)
 - Agricultural cooperative universities in South Korea, India

4. Indian Cooperative Sector and Skilling Framework

Skill Policies and Programs

- **Key policies:**
 - National Policy on Skill Development (2009)
 - National Policy for Skill Development and Entrepreneurship (2015)
 - National Skill Development Mission (NSDM, 2015)

- **Institutions:**
 - Ministry of Skill Development and Entrepreneurship (MSDE)
 - NSDC, NSDA, DGT
 - Sector Skill Councils (SSCs)
- **Schemes:**
 - PMKVY
 - Skill India Mission
 - NAPS
 - JSS
 - SANKALP
 - STRIVE
 - PM-YUVA
 - India International Skill Centres (IISCs)

NEP 2020: Integrating Skill Development

- **Promotes:**
 - Multidisciplinary HEIs
 - Entrepreneurial learning
 - Skill integration
 - Social mobility and job-readiness

5. Institutional Innovation: Tribhuvan Sahkari University

- Introduced in 2025 via Bill to transform IRMA into a national cooperative university.
- **Objective:** Promote cooperative education, training, research.
- **Vision aligned with:**
 - “Sahkar Se Samridhi”
 - “Viksit Bharat”
- First specialized university for cooperatives in India.

Importance and Roles

- Address fragmented training ecosystems.
- Set national and global education standards.
- Enable multidisciplinary learning.
- Encourage youth through incubation and entrepreneurship.
- Guide digital transformation in cooperatives.

Legacy of IRMA

- Founded in 1979 by **Dr. Verghese Kurien**.
- Pioneered rural development, **dairy revolution (White Revolution)**.
- **Partnered with:**
 - NDDB
 - GCMMF (Amul)
 - NCDFI
 - Tribhuvandas Foundation
- **Known for:**
 - Research rigour
 - Consultancy
 - Rural development pedagogy.

Future Opportunities

- Support from MoC and other ministries
- Use of Cooperative Education Fund
- Access to IRMA’s pedagogy and networks
- Opportunity to be global hub for cooperative education

6. Challenges and Opportunities Ahead

Opportunities

- Institutional standardization
- Grassroots capacity building
- Public-private partnerships
- Youth engagement in cooperatives

Challenges

- Cooperatives as state subject
- Heterogeneity across states/sectors
- Professionalizing cooperatives
- Attracting youth and professionals.

Sectoral Imbalance

- 8.5 lakh cooperatives with 29 crore members
- **Concentration in:**
 - Housing
 - Dairy
 - PACS, credit, thrift
- Low-skill employment in trade, hospitality, education, transport.

Government Initiatives

- National Cooperation Policy
- **Formation of:**
 - National Cooperative Organics Limited (NCOL)
 - National Cooperative Exports Ltd (NCEL)
 - Bhartiya Beej Sahkari Samiti Limited (BBSSL)
 - Digitalization of M-PACS

7. Conclusion

- Renewed national focus on cooperatives and education institutions is timely.
- **A systemic approach is needed:**
 - Policy alignment (centre and state)
 - Lifelong learning
 - Stakeholder partnerships
- **Skill is a strategic enabler:**
 - Builds cooperative resilience
 - Strengthens governance
 - Promotes economic and social sustainability
- Investing in skill development will unlock the potential of cooperatives and lead India to a more inclusive and self-reliant economic future.

ARTICLES FROM DOWN TO EARTH (JUNE 2025)

REGULATING GENE-EDITED CROPS

Context: India should establish an independent biosafety institute to assess merits of farm products developed through modern biotechnology.

Gene-Edited Rice Varieties: DRR Dhan 100 (Kamala) and Pusa Rice DST1

- India has unveiled its first gene-edited rice varieties — DRR Dhan 100 (Kamala) and Pusa Rice DST1 — developed by **Indian Council of Agricultural Research (ICAR) laboratories**.
- These varieties are claimed to be **high-yielding, drought- and salinity-tolerant, and require lower doses of fertilisers and water**. They also **emit less methane and are considered non-transgenic**, as no foreign DNA was introduced using the CRISPR-Cas technique.
- According to ICAR, **editing a novel allele of a cytokinin oxidase/dehydrogenase gene** led to increased grain numbers per panicle, resulting in higher yields. Field trials across multiple agro-ecological zones reportedly showed a 19% yield increase over Samba Mahsuri, along with earlier maturity.

Genome editing, also known as gene editing, refers to a set of techniques that enable scientists to modify an organism's DNA. These methods allow for the precise addition, deletion, or alteration of genetic material at specific locations within the genome.

Plant Biotechnology: A Broader Perspective

- Plant biotechnology goes beyond GM or gene editing and includes core technologies such as **tissue culture, genome sequencing, gene mapping, and molecular markers** for trait identification.
- ICAR's integration of genome sequencing and mapping with conventional breeding has led to **high-yielding, disease- and pest-resistant crop varieties**.
 - These have significantly contributed to India's food self-sufficiency. In **2024–25, India produced 14.9 million tonnes of rice**, surpassing China (14.4 million tonnes) as the world's top rice producer.
- Without modern science and biotechnology, particularly in agriculture, this success would not have been possible. The application of modern technology in agriculture is vital, but it should **remain accessible to small farmers**,

safe for the environment and human health, and, above all, it should raise the incomes and livelihoods of the millions of small farmers and the rural poor.

Concerns Related to Gene-Edited Crops

- The **Environment Ministry's exclusion of gene-edited crops from regulatory checks applicable to GM crops** (under the Department of Biotechnology and other environment agencies) since April 2022 raises concerns.
- The developers **have not disclosed technical details about the genes altered, field trial procedures, or data** such as irrigation levels, fertiliser doses, and pest resistance. Environmental and biosafety standards followed during development also remain undisclosed.
- CRISPR-Cas technology is **patented and monopolised by global firms such as CRISPR Therapeutics, Editas Medicine, and the Broad Institute**. ICAR acquired an academic licence for this technology from the Broad Institute in 2016.
 - There are concerns over ICAR's potential partnership with private seed companies for large-scale seed production, raising issues about commercial use of academic licences, seed pricing, and farmer accessibility—similar to past issues with Bt cotton.
- Site-Directed Nucleases (SDN1 and SDN2) used in gene editing are **mutagenic tools for gene knockout or trait enhancement**. However, traits like high yield or drought tolerance are polygenic, involving multiple genes across chromosomes.
- **Unintended effects of residual CRISPR-Cas9 enzymes in plant genomes are not fully understood**. ICAR laboratories have not published peer-reviewed data or released their technical findings publicly.

Need for an Independent Biosafety Institute

- India should establish an independent biosafety institute **to evaluate the risks and benefits of biotechnology-based farm products**. Regulatory authorities must assess each case thoroughly to ensure biosafety, ecological sustainability, and protection of farmers' interests.
- The application of modern biotechnology, including gene-edited crops, is essential but must be aligned with local agro-ecosystems to be truly effective and sustainable.

Way Forward

- To ensure long-term effectiveness, gene-editing approaches **must move beyond single-gene manipulation, which has**

shown limited durability—as seen in the case of Bt cotton. Improving polygenic traits like yield and salinity tolerance requires targeting multiple genes related to root traits, mineral absorption, photosynthesis, and more.

- The adoption of advanced tools like improved CRISPR-Cas9, capable of precise multiplex gene editing, **should be paired with ecological approaches that preserve biodiversity** and account for complex interactions within the agro-ecosystem.
- **Addressing safety concerns is critical**, as the unintended effects of gene-editing tools remain poorly understood.
- **Public institutions like ICAR, which focus on region-specific, farmer-centric innovations, must be supported.** At the same time, a robust, transparent regulatory framework is essential to ensure biosafety, accountability, and sustainability in the use of gene-editing technologies.

Conclusion

Gene-edited crops hold significant potential for improving agricultural productivity and sustainability in India. However, without transparent data, rigorous regulation, and public accountability, their long-term impact remains uncertain. A science-driven, **independent biosafety framework is essential to ensure these innovations are safe, inclusive**, and aligned with the needs of Indian farmers and ecosystems.

INDIA'S WIND ENERGY SECTOR

Context: India's Wind Energy Surpasses 51 GW, but Faces Headwinds in Meeting 2030 Targets

Introduction

- As the world marked World Wind Day 2025 on June 15, India has crossed a significant milestone, **with wind power capacity surpassing 51 gigawatts (GW)** as of May, consolidating its position as the fourth-largest wind energy market globally.
- **Gujarat has emerged as the national frontrunner**, with installed capacity rising to 12,677 MW by March 2025 from 11,722 megawatts (MW) in March 2024 — an annual growth of 8.14 per cent. Tamil Nadu, long seen as India's wind energy pioneer, maintained its second-place status, registering a steady 10.71 per cent growth to 11,739 MW from 10,603 MW.
- **Karnataka, however, stood out as the fastest-growing state**, recording a striking 22.13 per cent increase to 7,351 MW from 6,019 MW, underscoring its rise as a key player in India's wind sector.

Key Challenges Hindering India's Wind Energy Growth

- **Manufacturing capacity severely underutilized:** India's wind turbine manufacturing sector is marked by a striking paradox: While domestic capacity stands at a robust 18 GW annually across 14 original equipment manufacturers (OEM), only 4.15 GW was installed in

2024-25, less than a quarter of available capacity.

- **Grid bottlenecks are a growing threat:** India's inadequate transmission infrastructure now poses one of the most pressing threats to its renewable energy expansion. Tamil Nadu offers a cautionary tale; in a single week, 70 million units of renewable power could not be evacuated due to grid curtailment.
 - The government has proposed expanding grid capacity to 111 GW by 2030, with 94 GW targeted by 2027 through initiatives such as the Green Energy Corridor and high-voltage direct current networks. However, grid development continues to lag behind the pace of renewable installations, creating a bottleneck that could stall the energy transition.
- **Import dependency, cost pressures and cybersecurity concerns:** Despite India's manufacturing potential, the wind sector remains hamstrung by import dependency and cost competitiveness challenges.
 - **Import Dependency and Cost Pressures:** Indian-made turbines are estimated to be 30-60 per cent more expensive than their Chinese counterparts, largely due to higher input costs and continued reliance on imported components. Key parts such as special bearings, gearboxes, yaw mechanisms and turbine controllers are still imported, often from China, which supplies half of India's hub castings and 90 per cent of gearbox castings.
 - **Cyber Security Concerns:** An emerging challenge facing India's wind energy sector involves cybersecurity risks associated with imported equipment and foreign-operated systems. According to apex central think tank NITI Aayog's report on Domestic manufacturing capacity and cybersecurity challenges, imports from countries like China raise significant data security concerns, including OEMs' data collection servers located outside India and vulnerabilities in power system network operations.

Opportunities

- Amid these challenges, **wind repowering offers a viable opportunity** for enhancing generation without acquiring additional land. By **replacing older, low-capacity turbines with newer, high-efficiency models**, output can potentially double or triple from the same site.
- States like Tamil Nadu, Maharashtra and Gujarat, home to India's oldest wind farms, many with sub-1.5 MW turbines, are ripe for repowering.
- Repowering initiatives have the **potential to significantly increase energy output, lower operational costs and deliver over 25 years of consistent power generation**, all without the need for additional land. By leveraging existing grid connections and infrastructure, repowering enables more efficient use of ageing wind sites.

However, **policy support for repowering remains nascent** and must be made economically attractive to drive adoption. Without clear incentives or streamlined procedures, developers remain hesitant to invest in upgrading older sites, many of which operate with turbines below 1.5 MW capacity.

What Needs to be Done?

- India's wind sector has long been affected by policy uncertainty and abrupt regulatory shifts. The move from feed-in tariffs to competitive bidding slashed tariffs, squeezed margins for manufacturers and shifted project development from OEMs to independent power producers. While **this transition aimed to drive efficiency, it introduced volatility** that continues to unsettle investor confidence.
- In 2023, the MNRE unveiled a roadmap for 50 GW of annual renewable energy tenders, with 10 GW earmarked specifically for wind. Yet, consistent execution of this tendering schedule remains elusive. A recent overhaul in the bidding process, **moving from reverse**

auctions to a single-stage, two-envelope competitive system, is intended to curb unrealistic pricing. Still, predictable and transparent implementation will be key to restoring trust in the sector.

- As India marked World Wind Day 2025, the wind energy sector stood at a crossroads. With manufacturing capacity vastly underutilised, transmission networks falling behind generation growth and import dependencies eroding cost competitiveness, the road to the 2030 target of 140 GW is anything but smooth.

Conclusion

Achieving this goal will require **urgent and coordinated action across several fronts.** Accelerating grid infrastructure upgrades, introducing targeted PLI schemes for key components, maintaining policy consistency and fostering a stable domestic market are essential steps. Only by addressing these core challenges can India unlock the full potential of its wind energy sector and position itself as a global leader in the transition to clean, renewable power.



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(JUNE 2025)

A WEAKENED CONSTITUTIONAL GUARANTEE TO FREE SPEECH

Context: The article critiques the Supreme Court's cautious approach to upholding the Constitution's Article 19(1) (a) guarantee of the right to free speech and expression, particularly in politically delicate situations. It highlights a concerning lack of coherence in the Court's interpretation and application of constitutional principles by contrasting two recent Supreme Court rulings, one of which protects free speech and the other of which dilutes it.

Key cases triggering debate

Ali Khan Mahmudabad Case, 2025

- Recently, a professor from Ashoka University was arrested for his social media posts on Operation Sindoor.
- He was **charged under several BNS 2023 provisions** for, encouraging religious animosity between groups, making claims that were detrimental to national integration, and committing acts that endangered India's sovereignty, unity, and integrity.
- Supreme Court's response: **The court refused to halt the investigation while granting bail**, and it also issued a **comprehensive gag order that prevented Mahmudabad from discussing the social media posts and further prohibited him from "expressing any opinion in relation to the terrorist attack on Indian soil."**
- In order to "holistically understand the complexity of the phraseology employed" and to allow for a "proper appreciation" of the expressions used in two social media posts, **the Court mandated the creation of a special investigation team (SIT).**
- While the **listed grounds may be important, they are also vague and open to interpretation.**
- Therefore, it is necessary to define precisely what poses a threat to public order, state security, or Indian sovereignty.

Contrasting case

Imran Pratapgarhi vs. State of Gujarat, 2025

- Striking down criminal proceedings against a member of Parliament for reciting and sharing a poem on social media.
- The SC emphasized that **free expression cannot be suppressed just because it makes some people uncomfortable or insecure.**

Differences in above two cases

- In Pratapgarhi, the Supreme Court assessed the poem in question and found no link between the speech and any imminent threat to public order.
- **However, the court in Mahmudabad did not address the connection between the expression and the purported danger to public order**, national sovereignty, or intercommunal harmony. Rather, it was "satisfied that no case for staying the investigation is made out," the Court declared categorically.
- In both these cases, **the provisions invoked are not only broad and vaguely worded but also routinely and arbitrarily enforced to have a chilling effect on free speech.**
- For instance, the requirement of "outraging religious feelings" under **Section 299 of the BNS** (formerly Section 295A of the IPC), "promoting disharmony or feelings of enmity" under **Section 196(1)(b) of the BNS** (formerly Section 153A of the IPC), or expressions prejudicial to "national integration" and "sovereignty, unity, and integrity of India" under **Sections 197(1)(c) and 152 of the BNS**, respectively, are all **exceptionally vague and susceptible to misuse.**

Evolution of Freedom of Speech and Expression Through Various Judgements

- **State of Madras v. Romesh Thapar (1950):** Established the framework for a limited interpretation of free speech restrictions, holding that **only speech that poses a threat to public order may be curtailed.**
- **State of Bihar v. Ram Manohar Lohia (1960):** Established the "proximity test," which states that speech restrictions must be directly and immediately related to public disorder.
- **Shreya Singhal v. Union of India (2015):** Section 66A of the IT Act was overturned for being ambiguous and sweeping; it was decided that **only incitement, not just advocacy or discussion, could be restricted.**
- **Patricia Mukhim v. State of Meghalaya (2021):** It was reaffirmed that **social commentary is protected speech and is not illegal unless there is actual disturbance and criminal intent (mens rea).**

Conclusion

It is essential that constitutional courts act as steadfast guardians of liberty, ensuring that reasonable restrictions

do not become a tool for suppressing dissent. A principled, consistent, and transparent approach will not only strengthen public faith in the judiciary but also preserve the democratic ethos enshrined in the Constitution.

BOUNTIFUL HARVESTS

Context: According to the **Third Advance Estimates of Foodgrain Production for 2024–2025**, foodgrain production reached a record high of **354 million tonnes in May 2025, up 6.5% and continuing a nine-year upward trend**. This demonstrates how resilient India's agriculture is in spite of underlying structural problems, climate change, and unpredictable monsoons.

Deeper structural concern: Diversification is a significant challenge because the **policy environment still favours cereals despite the growing demand for high-value and nutritious products** like dairy products, millets (nutri-cereals), pulses, and horticulture.

Trends in Production, Acreage, and Yields

- With the exception of the first year, **foodgrain production has risen consistently over the last ten years**.
- **Acreage Expansion:** Although there were variations among crop types, **the area planted under food grains grew gradually**.
- **Productivity Growth:** Improvements in yield outpaced increases in acreage by a factor of three.

Fluctuation in Acreage (Last 10 Years)

- **Wheat:** Highest fluctuation; output declined in 5 years.
- **Nutri-cereals and Pulses:** The area fell in 4 years each.
- **Rice:** Most stable; area declined in only 3 years.
- Overall acreage declined only 3 times, and only marginally (less than 2%).

Trends in Yield

- The yield per hectare of rice, wheat, and nutri-cereals only decreased once in ten years.
- The yield of pulses decreased for two years.
- Productivity growth was not substantially hampered by these slight decreases.

The fluctuation of production

- **Production declined for only one year for each of the major cereal crops.**
- With four years of decline, **pulses displayed greater volatility**, which increased reliance on imports.

Structural Challenges in Cropping Patterns

- The makeup of foodgrain production has not changed much in spite of overall growth.
- Among the **130 million hectares of foodgrain acreage that have grown over the past ten years, the expansion of rice and wheat was responsible for 86 million hectares, or two-thirds**.
- The area for nutri-cereals stayed essentially unchanged.
- About one-fifth of the total increase was due to the notable **40 million ha increase in pulses**.
- **Cereals' percentage of total foodgrain production** stayed at **about 93%**, essentially unchanged from 2014 to 2015, suggesting a rigid cropping pattern.
- **Nutrition:** The sustained dominance of cereals is **not in line with dietary requirements**.
- **Inflation:** Food inflation is fuelled by insufficient production of high-value crops.
- **Policy Distortion:** **Nutritious crops receive insufficient support due to government incentives that favour cereals**.

State-Level Trends

- The **top five states**—Uttar Pradesh, Madhya Pradesh, Punjab, Rajasthan, and Bihar—**make up about half of the output**.
- The top ten states produce almost 80 percent of the country's output.
- These trends demonstrate the **regional concentration of production** and the different strategies employed by states, some relying on expanding land, others on increasing productivity.

Conclusion

The foodgrain sector in India has grown and produced with remarkable stability. A more diversified, balanced, and sustainable cropping system must be supported by agricultural policy to move away from reliance on rice and wheat and achieve the future goals of price stability, climate resilience, and nutrition security.

QUICK REVISION

IMPORTANT EVENTS/SUMMITS/CONFERENCES IN JUNE 2025

	Event/Summit/Conference	Details
1.	Bonn Climate Change Conference	<ul style="list-style-type: none"> It is an annual mid-year meeting that takes place under the United Nations Framework Convention on Climate Change (UNFCCC) — an international agreement, signed in 1992, that has provided a basis for climate negotiations.
2.	G7 Summit	<ul style="list-style-type: none"> The 2025 G7 Leaders' Summit was held in Kananaskis, Alberta, from June 15 to 17, 2025.
3.	International Telecommunication Union (ITU-T) Focus Group on AI-Native for Telecommunication Networks (FG-AINN)	<ul style="list-style-type: none"> India took centre stage in global telecom innovation by hosting the 3rd International Telecommunication Union (ITU-T) Focus Group on AI-Native for Telecommunication Networks (FG-AINN) in New Delhi from June 11–13, 2025. The meeting, organised by the Telecommunication Engineering Centre (TEC) under the Department of Telecommunications (DoT), aimed to redefine how future telecom networks operate using Artificial Intelligence (AI) as a core, rather than an auxiliary, component.
4.	Agri Stack Conference	<ul style="list-style-type: none"> The Ministry of Agriculture convened a national-level conference in New Delhi, to drive forward the implementation of Agri Stack. The event served as a critical platform for States and Central authorities to align on using technology to enhance transparency.
5.	First Assembly of the International Big Cat Alliance	<ul style="list-style-type: none"> India demonstrated its leadership in global wildlife protection by convening the first-ever International Big Cat Alliance (IBCA) Assembly in New Delhi. It laid the groundwork for an international alliance dedicated to the protection of seven major big cat species — Tiger, Lion, Leopard, Snow Leopard, Cheetah, Jaguar, and Puma.
6.	Indian Conservation Conference (ICCON) 2025	<ul style="list-style-type: none"> The Indian Conservation Conference (ICCON) 2025, India's flagship biodiversity event, took place from June 25 to 27 at the Wildlife Institute of India (WII) in Dehradun. Hosted by the Ministry of Environment, Forest and Climate Change (MoEFCC), the event aims to unite over 500 participants

IMPORTANT DAYS IN JUNE 2025

Date	Day	Significance / Remark / Detail
5 June	World Environment Day	<ul style="list-style-type: none"> Led by the United Nations Environment Programme (UNEP) and held annually on 5 June since 1973, World Environment Day is the largest global platform for environmental public outreach and is celebrated by millions of people across the world. In 2025, it was hosted by the Republic of Korea.

7 June	World Food Safety Day	<ul style="list-style-type: none"> World Food Safety Day on 7 June aims to draw attention and inspire action to help prevent, detect and manage foodborne risks, contributing to food security, human health, economic prosperity, agriculture, market access, tourism and sustainable development. The World Health Organisation (WHO) and the Food and Agriculture Organisation of the United Nations (FAO) jointly facilitate the observance of World Food Safety Day, in collaboration with Member States and other relevant organisations.
8 June	World Oceans Day	<ul style="list-style-type: none"> Theme: Wonder: Sustaining what sustains us World Oceans Day reminds every one of the major role the oceans have in everyday life. They are the lungs of our Planet and a major source of food and medicine and a critical part of the biosphere.
11 June	International Day of Play	<ul style="list-style-type: none"> Theme: Choose Play – Every Day International Day of Play is a time to celebrate the power of play. It's a time to raise awareness about how central play is to every child's development and well-being.
12 June	World Day against Child Labour	<ul style="list-style-type: none"> Every 12 June, the International Labour Organisation joins forces with ILO constituents and partners around the world to commemorate the World Day Against Child Labour. This year's theme reflects both the progress achieved and the urgency to intensify action to meet global targets.
14 June	World Blood Donor Day	<ul style="list-style-type: none"> The event serves to raise awareness of the need for safe blood and blood products and to thank voluntary, unpaid blood donors for their life-saving gifts of blood.
20 June	World Refugee Day	<ul style="list-style-type: none"> Theme: Solidarity with Refugees World Refugee Day is a moment to honour the courage and resilience of refugees, listen to their stories, and advocate for lasting solutions to displacement. It reminds us that welcoming refugees strengthens societies, fosters innovation, and builds communities where everyone belongs.
21 June	International Day of Yoga	<ul style="list-style-type: none"> This year marks the 11th International Day of Yoga with the theme "Yoga for One Earth, One Health", which echoes a vital truth that personal wellness and planetary health are inseparably linked.
23 June	United Nations Public Service Day	<ul style="list-style-type: none"> The UN Public Service Day intends to celebrate the value and virtue of public service to the community; highlight the contribution of public service in the development process; recognise the work of public servants, and encourage young people to pursue careers in the public sector.
27 June	Micro-, Small and Medium-sized Enterprises Day,	<ul style="list-style-type: none"> Theme: Enhancing the role of Micro-, Small and Medium-sized Enterprises (MSMEs) as drivers of Sustainable Growth and Innovation
29 June	International Day of the Tropics	<ul style="list-style-type: none"> The International Day of the Tropics celebrates the extraordinary diversity of the tropics while highlighting unique challenges and opportunities nations of the Tropics face.
30 June	International Asteroid Day	<ul style="list-style-type: none"> In 2016, the United Nations General Assembly adopted resolution A/RES/71/90, declaring 30 June International Asteroid Day in order to "observe each year at the international level the anniversary of the Tunguska impact over Siberia, Russian Federation, on 30 June 1908, and to raise public awareness about the asteroid impact hazard.

TERMS IN NEWS: JUNE 2025

Term	Meaning and Details
Black Box	<ul style="list-style-type: none"> Black boxes are flight recorders. Aircraft are required to be equipped with two kinds of recorders — the cockpit voice recorder (CVR) and the flight data recorder (FDR) — which together provide a complete picture of what happened in the lead up to a crash.

OBITUARIES IN JUNE 2025

	PERSON	IMPORTANT INFORMATION
1.	Daji Panshikar	<ul style="list-style-type: none"> He was a renowned scholar, author, and literary commentator, also known as Narahari Vishnu Shastri. He was widely revered for his scholarly interpretations of: <ul style="list-style-type: none"> ➤ Mahabharata ➤ Eknaathi Bhagwat ➤ Bhavarth Ramayan Played a vital role in Natyasampada Natya Sanstha, a noted theatre organisation in Maharashtra.
2.	Vijay Rupani	<ul style="list-style-type: none"> Former Gujarat Chief Minister Vijay Rupani tragically died in the Air India Flight 171 crash in Ahmedabad.
3.	Ustad Ghulam Nabi Shah	<ul style="list-style-type: none"> Known as Hamle Bulbul, he was revered for his soulful voice, exceptional mastery over the sarangi, and contributions to preserving Kashmiri lok sangeet.
4.	Nellai Su. Muthu	<ul style="list-style-type: none"> He was a celebrated scientist formerly with ISRO and an influential Tamil writer.
5.	Maruti Chitampalli	<ul style="list-style-type: none"> He was an environmental guardian and Padma Shri awardee, revered as Aranya Rishi. A former forest officer and conservationist par excellence, Chitampalli was a revered figure in India's environmental movement, known for blending scientific research, wildlife preservation, and regional literature to inspire generations.

AWARDS AND PRIZES IN JUNE 2025

	Award	Awarded to	Details
1.	World's Best School Prize 2025	-	<ul style="list-style-type: none"> A Zilla Parishad (ZP) school in Pune district's Jalindarnagar village has been shortlisted among global finalists for the World's Best School Prize 2025 in the category of Community Collaboration in education. Three other Indian schools – one each from Karnataka, Haryana, and Uttar Pradesh – have also been shortlisted under various categories for the award organised by UK-based international education platform T4 Education.
2.	2025 Bloomberg Philanthropies Awards for Global Tobacco Control	-	<ul style="list-style-type: none"> India is among the six countries that received 2025 Bloomberg Philanthropies Awards for Global Tobacco Control for prioritising tobacco cessation approaches to reach a significant number of tobacco users in the country. India was presented the 'O' category award for promoting tobacco cessation. The 'O' is the MPOWER policy package of the World Health Organisation (WHO) that stands for 'Offer help to quit tobacco use.'

3.	Sahitya Akademi Yuva Puraskar	-	<ul style="list-style-type: none"> The Sahitya Akademi on June 18, 2025, announced the names of 23 writers for its 'Yuva Puraskar'. No award is given in the Dogri language this year. The awardees include Advait Kottary in English, Parvati Tirkey in Hindi, Neha Rubab in Urdu, Latshmihar for Tamil and Prasad Suri for Telugu.
4.	Sahitya Akademi Bal Puraskar	-	<ul style="list-style-type: none"> The Akademi announced the names of 24 authors for its Bal Sahitya Puraskar. In English, Nitin Kushalappa MP won the award. Similarly, for Hindi and Urdu, the award was given to Sushil Shukla and Ghazanfar Iqbal, respectively.
5.	Miss World 2025	Opal Suchata Chuangsri	<ul style="list-style-type: none"> Thailand's Opal Suchata Chuangsri wins Miss World 2025 in Hyderabad, marking Thailand's first-ever victory. Ethiopia's Hasset Dereje Admassu named runner-up.
6.	National e-Governance Awards 2025	-	<ul style="list-style-type: none"> National e-Governance Awards are presented annually to recognise best practices in e-governance initiatives across the country. Rohini Gram Panchayat, a fully tribal village in Dhule district, Maharashtra, has achieved national prominence by securing the Gold Award in the National e-Governance Awards 2025. Silver: West Majlishpur Gram Panchayat, Tripura Jury Awards: Palsana (Gujarat) & Suakati (Odisha)
7.	Digital Payments Award 2024-25	India Post Payments Bank (IPPB)	<ul style="list-style-type: none"> India Post Payments Bank (IPPB), a government-owned digital banking entity under the Ministry of Communications, has been awarded the prestigious Digital Payments Award 2024-25 by the Ministry of Finance's Department of Financial Services.
8.	Champion of Digital Media Awards South Asia 2025	The Hindu	<ul style="list-style-type: none"> At the WAN-IFRA Digital Media Awards in Chennai, The Hindu was honoured with the title Champion of Digital Media Awards South Asia 2025, after securing an impressive total of 10 awards.

JUNE 2025 - DAILY MCQs FROM THE HINDU & INDIAN EXPRESS

DAILY MCQs PRACTICE

Q1. Consider the following statements with respect to the Hoyle-Narlikar theory of gravitation:

1. The theory modifies Einstein's General Theory of Relativity by proposing that gravitational attraction propagates at a finite speed, rather than instantaneously.
2. The Hoyle-Narlikar theory introduces the concept of a "creation field" to explain the continuous creation of matter in the universe.
3. This theory successfully explains the accelerated expansion of the universe by incorporating the concept of dark energy.

How many of the above statements is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q2. What is the main objective of the Broadband India Forum (BIF)?

- (a) To regulate internet tariffs in India
(b) To promote the development and adoption of broadband and digital infrastructure in India
(c) To provide free internet to all rural households
(d) To manufacture telecom equipment in India

Q3. Which of the following is not a part of Pakistan Occupied Jammu and Kashmir?

- (a) Mirpur (b) Muzaffarabad
(c) Srinagar (d) Poonch (Pakistan-administered part)

Q4. Consider the following with reference to 'The UN Environment Programme (UNEP)':

1. UNEP is the leading global environmental authority that sets the environmental agenda and promotes sustainable development.

2. It was established after the Paris Agreement was signed in 2015.
3. UNEP coordinates the annual World Environment Day celebrated on June 5th.
4. It operates under the United Nations and works closely with other UN bodies and governments worldwide.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q5. Consider the following with reference to Lions species in cat family:

1. The Asiatic lion is found primarily in the Gir Forest of Gujarat, India.
2. African lions live in various habitats across Sub-Saharan Africa including savannas and grasslands.
3. Male lions have a mane which varies in colour and size depending on their age and region.
4. Lions are the only cats that live in social groups called prides.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q6. Consider the following with reference to the Ajanta paintings:

1. Ajanta paintings are ancient Buddhist mural paintings dating back to the 2nd century BCE to about 480 CE.
2. They primarily depict scenes from the Jataka tales, illustrating the previous lives of the Buddha.
3. The paintings are done on the walls and ceilings of rock-cut caves in Maharashtra.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

- Q7. What is the primary difference between B cells and T cells in the immune system?
- B cells produce antibodies, while T cells directly attack infected cells
 - B cells destroy viruses, while T cells produce antibodies
 - Both B cells and T cells only work outside the bloodstream
 - B cells are part of the nervous system, while T cells are part of the immune system

- Q8. With reference to the Securities and Exchange Board of India (SEBI), consider the following statements:
- SEBI is a statutory body established by an Act of Parliament
 - It regulates both the primary and secondary markets in India.
 - SEBI has the authority to impose penalties on companies for violating securities laws.

Which of the statements given above is/are correct?

- 1 and 2 only
- 2 and 3 only
- 1 and 3 only
- 1, 2 and 3

- Q9. What is the primary role of the Indian Army's White Knight Corps?
- Guarding India's eastern coastline
 - Conducting naval operations in the Arabian Sea
 - Safeguarding the Line of Control (LoC) in Jammu and conducting counter-insurgency operations
 - Managing India's missile defense systems

- Q10. With reference to Rights of Persons with Disabilities Act 2016, consider the following statements:
- Thalassemia is one of the 21 disabilities recognised under the act.
 - It empowers both State and Central government to notify any other category of specified disability.
 - India ratified the United Nations Convention on the Rights of Persons with Disabilities (UNCRPD) in 2016.

How many of the above statements is/are incorrect?

- Only one
- Only two
- All three
- None

- Q11. Which of the following statements are correct in respect of the economic effects of tariffs on AI innovation:
- Tariffs disrupt global supply chains, increasing costs and discouraging investment in innovation.
 - Empirical studies suggest a one standard deviation increase in tariffs reduces output growth by about 0.4% over five years.
 - Tariffs always increase consumer-level AI application costs immediately.

Select the answer using the code given below:

- 1 and 2 only
- 2 and 3 only
- 1 and 3 only
- 1, 2 and 3

- Q12. Which of the following statements best describes a United Nations Security Council (UNSC) Resolution under Chapter VII of the UN Charter?
- It is legally binding on all UN member states.
 - It is advisory in nature and requires General Assembly approval.
 - It applies only to the five permanent members of the UNSC.
 - It can be vetoed by a two-thirds majority in the General Assembly.

- Q13. With reference to EV's, consider the following statements
- They release substantially larger numbers of small plastic particles in the atmosphere than conventional ones.
 - Electric vehicles are significantly heavier than conventional petrol vehicles.
 - Road transport accounts for almost 10% of global GHG emissions.

How many of the above statements is/are incorrect?

- Only one
- Only two
- All three
- None

- Q14. With reference to K2-18b, consider the following statements:
- According to scientists, it is a habitable exoplanet.
 - It is 120 light years away from Earth.
 - Dimethyl sulfide (DMS) is a gas that, on Earth, is primarily produced by marine plankton.

How many of the above statements is /are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q15. Consider the following statements:

1. Maoism emphasizes the role of the peasantry as the main revolutionary force.
2. Maoism also focuses on the urban proletariat as the sole revolutionary class.

Which of the statements given above is /are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q16. Consider the following with reference to the use of non-kinetic tools in modern warfare:

1. Cyber warfare is considered a non-kinetic tool as it disrupts enemy communication without physical destruction.
2. Economic sanctions are a form of non-kinetic warfare aimed at weakening the opponent's economy.
3. Psychological operations (psy-ops) use misinformation to influence the morale of enemy troops and civilians.
4. Use of drones equipped with missiles is a non-kinetic method of warfare.

How many of the above is /are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q17. Consider the following with reference to the National Payments Corporation of India (NPCI):

1. NPCI developed the Unified Payments Interface (UPI), a real-time payment system.
2. NPCI has partnered with African countries like Namibia and Ghana to develop instant payment systems.
3. NPCI operates as a government-owned regulatory body for all digital payments in India.
4. NPCI's systems are proprietary and do not support open-source technology.

How many of the above is /are not correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q18. Consider the following with reference to the Digital Public Infrastructure (DPI):

1. DPI refers to open, scalable, and interoperable digital systems designed to deliver public services.
2. India's DPI platforms like Aadhaar, UPI, and CoWIN have been shared with several African countries through collaborative agreements.
3. DPI models promoted by India are proprietary, closed-source, and driven by surveillance mechanisms.

How many of the above is /are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q19. With reference to G7 Summit, consider the following statements

1. It was formed in the 1970s in response to global economic crises.
2. The upcoming G7 Summit will be held in Alberta.
3. The Partnership for Global Infrastructure and Investment (PGII) is a G7-led initiative.

How many of the above statements is /are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q20. With reference to Foreigners Tribunal (FT), consider the following statements

1. These are quasi-judicial bodies.
2. The FTs are currently exclusive to Assam.
3. Each FT is headed by a member drawn from judges, advocates, and civil servants with judicial experience.

How many of the above statements is /are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q21. With reference to the Madden-Julian Oscillation (MJO), consider the following statements:

1. MJO is a system of winds, clouds, and pressure that originates in the Indian Ocean.
2. It travels eastward around the globe and can influence weather patterns, including monsoon activity.
3. In its favourable phase, MJO enhances monsoon rainfall over India.

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. With reference to Red Teaming in military strategy, which of the following best describes its purpose?

- (a) It focuses on developing new combat technologies for frontline deployment.
(b) It is a method of conducting surprise military drills to test troop readiness.
(c) It involves simulating adversary behavior to identify weaknesses and challenge strategic plans.
(d) It is a strategy used to negotiate ceasefires through backchannel diplomacy.

Q23. Consider the following with reference to the National Quantum Mission:

1. The mission has a budget allocation of several thousand crores over five years to support R&D and infrastructure.
2. It exclusively targets quantum cryptography and does not cover quantum computing or sensing.
3. The mission promotes collaboration between academia, industry, and government research institutions.

How many of the above is/are not correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q24. Which of the following is true about GSDP compared to GDP?

- (a) GSDP is the total output of a country
(b) GSDP includes international trade of a country
(c) GSDP only measures agricultural output of a state
(d) GSDP is the total output of a specific state or region within a country

Q25. Which of the following is/are major drivers of agricultural imports in India?

1. Low per-acre yields of oilseeds and pulses.
2. Absence of minimum support price-based procurement for pulses.
3. Decline in cotton and rubber production.

4. Ban on domestic production of dry fruits

Select the correct answer using the code below:

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

Q26. What is the key difference between a Variant of Interest (VOI) and a Variant of Concern (VOC)?

- (a) VOC is less transmissible than VOI
(b) VOC shows no impact on vaccine effectiveness
(c) VOI has limited impact, while VOC has proven impact on transmission or severity
(d) VOI spreads faster than VOC

Q27. Consider the following with reference to the Food Safety and Standards Act (FSSA), 2006:

1. FSSA consolidates various laws related to food safety and standards in India.
2. The Act covers regulations only for packaged foods and not for fresh produce.
3. FSSA mandates licensing and registration of all food business operators in India.

How many of the above is/are not correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q28. Which of the following statements are correct in respect of impact of the Street Lighting National Programme (SLNP):

1. It contributed to lowering India's peak power demand by over 1,500 MW.
2. It resulted in savings on electricity costs for local bodies.
3. It eliminated the need for any coal-based power plants in India.

Select the answer using the code given below:

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

Q29. Which of the following statements are correct in respect of the Lokpal:

1. It is a statutory body established by an Act of Parliament.

2. It has jurisdiction only over members of Parliament and not over government officials.
3. The Lokpal is appointed by the President on the recommendation of a selection committee.

Select the answer using the code given below:

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

Q30. Consider the following with reference to Zero Coupon Bonds:

1. Zero coupon bonds have higher interest rate risk compared to regular coupon bonds.
2. They are suitable for investors seeking regular income during the bond tenure.
3. The price of a zero coupon bond increases as it approaches maturity.
4. Zero coupon bonds do not involve reinvestment risk since no coupons are paid.

How many of the above is/are correct?

- (a) Only one (b) Only two
 (c) Only three (d) All four

Q31. What is the main objective of India's PRAGATI platform, which was recently praised by Oxford University?

- (a) To monitor agricultural production in real time
- (b) To promote private sector investment in education
- (a) To ensure e-transparency and accelerate delayed infrastructure projects
- (b) To regulate digital payments across rural India

Q32. Consider the following matches

1. Extended Fund Facility (EFF) - Emergency support during crises
2. Stand-By Arrangement (SBA) - Short-term balance of payments assistance
3. Rapid Financing Instrument (RFI) - Medium-term support with structural reforms

How many of the above is/are correctly matched?

- (a) Only one (b) Only two
 (c) All three (d) None

Q33. Consider the following statements with respect to Preamble to Indian constitution

1. The Congress party adopted a resolution to establish a socialist pattern of society in its Avadi session in 1955.
2. The word socialist is added by the 42nd amendment in 1976 in the Preamble of Indian constitution.
3. Preamble is a part of Indian constitution and is justiciable.

How many of the above is/are correctly matched?

- (a) Only one (b) Only two
 (c) All three (d) None

Q34. The Drake Passage is

- (a) a desert valley in southern Argentina.
- (b) a peaceful sea route between New Zealand and Australia.
- (c) a narrow and often stormy ocean passage between South America and Antarctica.
- (d) a mountain pass connecting Chile and Peru.

Q35. Which of the following statements are correct in respect of initiatives have been undertaken by Indian states to improve Early Childhood Education:

1. Uttar Pradesh has recruited nearly 11,000 ECE educators for Balvatikas.
2. Odisha has launched Shishu Vatikas in all government schools to prepare children aged 5-6 years for formal schooling.
3. Madhya Pradesh runs the monthly Bal Choupal programme to engage parents in play-based learning.

Select the answer using the code given below:

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

Q36. Consider the following with reference to the Heckman Curve and its implications:

1. The rate of return on investment in early childhood education is higher than that in later years of education.
2. Every dollar invested in ECE yields a return between \$7 and \$12.
3. Early childhood education has no significant impact on long-term earning potential.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q37. Consider the following statements regarding the body's response to inhaled pollutants:

1. At lower concentrations, the body can effectively cope with pollutants using its natural defence mechanisms.
2. Reactive Oxygen Species (ROS) are released by immune cells to neutralize foreign substances like pollutants.
3. In high concentrations, ROS can damage the body's own cells, especially in the respiratory system.
4. Antioxidants are produced by the body to protect cells from the harmful effects of excessive ROS.

How many of the above statements is/are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q38. Consider the following statements with reference to Dividends in Public Finance

1. A dividend refers to a portion of profits returned by a corporation or institution to its shareholders.
2. Dividends are a non-tax revenue source for the government and help in bridging fiscal deficits.
3. RBI dividends are governed by Ministry of Finance.

How many of the above statements is/are incorrect?

- (a) Only one (b) Only two
(c) All three (d) None

Q39. Consider the following with reference to devolution of funds to States:

1. Devolution refers to the transfer of powers and responsibilities from the Central government to the State governments.
2. The Constitution of India allows States to independently raise all their required revenues without any Centre interference.
3. States have full autonomy to decide the allocation of funds received from the Centre without any conditions.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q40. Consider the following with reference to the powers and functions of the Home Secretary:

1. The Home Secretary coordinates internal security matters of the country.
2. The Home Secretary has the authority to legislate laws related to public order.
3. The Home Secretary advises the government on matters related to disaster management.
4. The Home Secretary has the power to declare a state of emergency in any part of the country.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q41. Consider the following statements regarding Maintenance and Welfare of Parents and Senior Citizens Act, 2007

1. It is a legislation, initiated by Ministry of Social Justice and Empowerment.
2. This act provides an in-expensive and speedy procedure to claim monthly maintenance for parents and senior citizens.
3. This act also provides for the setting up of old age homes for providing maintenance to the indigent senior citizens and parents.

How many of the above statements is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q42. Consider the following statements with reference to National Cooperative Consumers Federation of India (NCCF)

1. It was established to function as the apex body of consumer cooperatives.
2. The management of NCCF vests in the Board of Directors.
3. NCCF operates under the Ministry of Finance, Government of India.

How many of the above statements is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q43. Consider the following with reference to 'Private Final Consumption Expenditure (PFCE)':

1. The PFCE refers to the total value of goods and services consumed by households within a country in a given period.

2. It includes both durable and non-durable goods, as well as services like education and healthcare.
3. PFCE forms a significant component of India's GDP, often contributing more than 55% to the total.
4. Expenditures by non-profit institutions serving households (NPISH) are also included under PFCE.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q44. Which of the following institutions initiated the establishment of the Financial Stability Board (FSB)?

- (a) International Monetary Fund (IMF)
(b) World Bank
(c) G20
(d) United Nations

Q45. Consider the following statements with reference to the country Paraguay

1. Paraguay is a landlocked nation in south-central North America.
2. Bordering Nations are Bolivia, Brazil, and Argentina.
3. Paraguay is among the top exporters of hydroelectricity.

How many of the above statements is/are incorrect?

- (a) Only one (b) Only two
(c) All three (d) None

Q46. Consider the following statements with reference to Sanchi Stupa

1. It was built by Ashoka in the third century BC.
2. Alexander Cunningham led the first formal survey and excavations at Sanchi.
3. It was designated a UNESCO World Heritage Site in 1989.

How many of the above statements is/are incorrect?

- (a) Only one (b) Only two
(c) All three (d) None

Q47. Consider the following statements:

1. The Leader of the Opposition in Lok Sabha must belong to the largest opposition party that has at least 15% of the total strength of the House.
2. The recognition of the Leader of the Opposition is made by the Speaker of the Lok Sabha.

Which of the statements given above is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q48. The primary difference between latent TB infection and active TB disease is:

- (a) Presence of viable bacteria vs. dead bacteria only
(b) Latent TB always progresses to active TB within 1 year
(c) Symptoms and transmissibility present in active TB but absent in latent TB
(d) Latent TB is resistant to all anti-TB drugs

Q49. Which of the following statements are correct in respect of electricity storage and hydrogen production:

1. Electricity storage and hydrogen production are currently treated as separate activities.
2. Combining hydrogen production with battery storage can improve the economic viability of both.
3. A policy recommendation is to rename green hydrogen as low-carbon hydrogen to include nuclear-based hydrogen.

Select the answer using the code given below:

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

Q50. Under Pradhan Mantri Ujjwala Yojana (PMUY), LPG connections are mainly provided to which category of beneficiaries?

- (a) Women from Below Poverty Line (BPL) families
(b) All rural households irrespective of income
(c) Senior citizens in urban areas
(d) Industrial workers in metropolitan cities

Q51. Consider the following statements with respect to Mount Etna

1. Etna's peak is the highest in Italy south of the Alps.

2. It is the largest of Europe's active volcanoes.
3. Etna has been a World Heritage Site since 2013, and according to UNESCO.

How many of the above statements is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q52. Consider the following statements with reference to District Legal Services Authority (DLSA)

1. It is a statutory body organized at the district level.
2. It is a body that shall be constituted by the State Government in consultation with the Chief Justice of the High Court.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q53. Which of the following statements are correct in respect of tribal communities of Arunachal Pradesh:

1. The Nyishi tribe is traditionally known for its distinct bamboo headgear adorned with hornbill beaks.
2. The Apatani tribe practices a unique form of sustainable wet rice cultivation without using animals or machines.
3. Both Nyishi and Apatani tribes share the same traditional religion and language.

Select the answer using the code given below:

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

Q54. Consider the following with reference to the Millet Missions in India:

1. The Millet Mission aims primarily to increase the use of millets for biofuel production.
2. The mission exclusively targets export promotion of millets to foreign countries.
3. Millet Missions aim to replace all traditional cereals with millets within five years.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q55. Which of the following is NOT a focus area of the 16th Finance Commission?

- (a) Equitable resource distribution
(b) Strengthening local governance
(c) Addressing tax evasion in the corporate sector
(d) Disaster management financing

Q56. Consider the following statements with respect to the census of 1931

1. The last nationwide caste census was conducted in 1931.
2. The Socio Economic and Caste Census (SECC) initiated in 2011 by the UPA government did not release specific caste data.

How many of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q57. Consider the following statements with reference to Brahmaputra River System

1. It rises in the Chemayungdung glacier in southwestern Tibet.
2. In Arunachal Pradesh, it is called the Dibang.
3. The Sankosh is a left bank tributary of the Brahmaputra and it forms the boundary between Assam and West Bengal.

How many of the above statements is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q58. The Yashpal Committee was concerned with:

- (a) School curriculum development
(b) Vocational training for youth
(c) Reforms in higher education in India
(d) Promotion of scientific research at the secondary level

Q59. In the Supreme Court case Anuradha Bhasin vs Union of India (2020), what was the primary legal issue?

- (a) Legality of the abrogation of Article 370 in Jammu & Kashmir
(b) Restrictions on freedom of speech and movement due to internet shutdowns in Jammu & Kashmir

- (c) Validity of the Citizenship Amendment Act (CAA)
- (d) Protection of fundamental rights during a public emergency

Q60. Consider the following with reference to grounds on which restrictions can be imposed under Article 19(2):

1. Security of the State
2. Protection of minority interests
3. Friendly relations with foreign states
4. Public health

How many of the above is/are not correct?

- (a) Only one (b) Only two
- (c) Only three (d) All four

Q61. Consider the following with reference to 'The Manila Declaration':

1. The Manila Declaration was adopted in 1992 during the International Conference on Water and the Environment.
2. The declaration was signed by all United Nations member states.
3. It focuses exclusively on water supply without addressing sanitation.

How many of the above is/are correct?

- (a) Only one (b) Only two
- (c) All three (d) None

Q62. Consider the following with reference to World Water Day:

1. It is observed annually on 22nd March.
2. The main theme for 2025 is Water and Climate Change.
3. UN-Water coordinates World Water Day activities globally.
4. It directly relates to Sustainable Development Goal 6 (Clean Water and Sanitation).

How many of the above is/are not correct?

- (a) Only one (b) Only two
- (c) Only three (d) All four

Q63. Consider the following matches

1. Indus River – Tibetan plateau

2. Brahmaputra – Kailash range
3. Ravi river – Kulu hills
4. Satluj river – Rakas lake
5. Chenab river – Himachal mountains

How many of the above are correctly matched?

- (a) Only two (b) Only three
- (c) Only four (d) All five

Q64. What is the primary impact of a reduction in the Cash Reserve Ratio (CRR) by the Reserve Bank of India?

- (a) It reduces government borrowing
- (b) It increases liquidity and promotes credit flow in the economy
- (c) It curbs inflation by absorbing excess money
- (d) It increases the reserve requirements of banks

Q65. Which of the following statements are correct in respect of the impeachment of a High Court judge:

1. It requires address supported by a special majority of each House of Parliament.
2. The procedure for impeachment of a High Court judge is the same as that for a Supreme Court judge.
3. A judge of a High Court can be removed on the grounds of proved misbehaviour or incapacity.

Select the answer using the code given below:

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

Q66. Consider the following statements with respect to PM MITRA scheme

1. It is inspired by the 5F vision i.e., - Farm to Fibre to Factory to Fashion to Foreign.
2. MITRA parks can be either Greenfield or Brownfield.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
- (c) Both 1 and 2 (d) Neither 1 nor 2

Q67. Where was the Global Investors Summit (GIS) 2025 organized?

- (a) Bhopal, Madhya Pradesh
- (b) Mumbai, Maharashtra

- (c) Kolkata, West Bengal
(d) Bengaluru, Karnataka

Q68. Consider the following with reference to United Nations Counter-Terrorism Committee (CTC):

1. The CTC was established by the UN Security Council Resolution 1373 in 2001.
2. Its main function is to monitor the implementation of measures to combat international terrorism by UN member states.
3. It reports directly to the UN General Assembly.
4. The CTC has the authority to impose sanctions on states that fail to comply with its recommendations.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q69. What does the term “cryptobiosis” mean?

- (a) A state of rapid growth in organisms
(b) A temporary suspension of metabolic activity to survive extreme conditions
(c) The process of photosynthesis in plants
(d) A form of communication between animals

Q70. With reference to Project ASMITA, consider the following statements

1. It is a collaborative effort of the UGC and the Bharatiya Bhasha Samiti to promote Indian languages in education.
2. A “Bahubhasha Shabdakosh”, is also a part of the project.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q71. Which of the following statements are correct in respect of ENACT (Enhancing Nature-based Solutions for an Accelerated Climate Transformation) initiative:

1. It is a collaborative initiative launched at the UNFCCC COP27 to scale up nature-based solutions for climate action.
2. The ENACT Partnership is jointly led by the United Nations Environment Programme (UNEP), the International Union for Conservation of Nature (IUCN), and the Government of Germany.

3. ENACT aims to deliver benefits for both biodiversity conservation and climate mitigation, but it excludes adaptation-related goals.

Select the answer using the code given below:

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

Q72. Consider the following with reference to National Family Health Survey (NFHS):

1. The NFHS is primarily conducted to collect data on health, nutrition, and family welfare indicators.
2. The Ministry of Health and Family Welfare is responsible for conducting the NFHS.
3. NFHS data is collected every 10 years to monitor long-term trends.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q73. The primary purpose of a Tariff Rate Quota (TRQ) is to:

- (a) Limit the total volume of imports to a country.
(b) Allow a specific quantity of a product to be imported at a reduced tariff rate.
(c) Apply a uniform tariff rate on all imports.
(d) Eliminate tariffs on agricultural products.

Q74. Which of the following statements are correct in respect of the Bar Council of India:

1. It is a statutory body established under the Advocates Act, 1961.
2. It prescribes standards of professional conduct and etiquette for advocates.
3. It has the power to appoint judges to the High Courts and Supreme Court.

Select the answer using the code given below:

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

Q75. Consider the following with reference to the Seventh Schedule of the Constitution of India:

1. It divides powers between the Union and the States through three lists — Union List, State List, and Concurrent List.

2. The Concurrent List allows both the Union and State governments to make laws, but in case of a conflict, State law prevails.
3. Subjects like police, public health, and law and order fall under the Union List.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q76. Consider the following statements with reference to The Viksit Krishi Sankalp Abhiyan

1. The primary objective of Abhiyan is to educate and empower farmers by increasing awareness about modern agricultural technologies, improved seed varieties, and efficient farming practices.
2. This campaign aligns with the government's vision of doubling farmers' income by 2025.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q77. Consider the following with reference to Child Labour (Prohibition and Regulation) Amendment Act, 2016:

1. It completely prohibits the employment of children below 14 years in all occupations and processes.
2. It allows children to help in family enterprises after school hours or during vacations, provided the work is non-hazardous.
3. The Act prohibits the employment of adolescents (14–18 years) in any occupation, including non-hazardous ones.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q78. Consider the following with reference to the Sustainable Development Goals (SDGs):

1. The SDGs were adopted in 2015 as part of the United Nations 2030 Agenda for Sustainable Development.
2. There are a total of 17 SDGs and 169 targets under the framework.
3. SDG 8 focuses on decent work and economic growth, which includes the aim to eliminate child labour by 2025.

4. The SDGs are legally binding on all United Nations member states.

How many of the above is/are not correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q79. Consider the following statements with reference to Pressurised Heavy Water Reactor (PHWR):

1. PHWRs can use natural uranium, avoiding reliance on enriched uranium imports.
2. RAPS-1 is India's first PHWR.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q80. Consider the following statements with reference to Swarm drones

1. They are autonomous or semi-autonomous UAVs that operate in coordinated groups.
2. Swarms are more resilient than traditional drones due to in-built redundancy.
3. Drone swarms are thus used to saturate air defences gathering intelligence, and attacking high-value targets.

How many of the above statements is/are incorrect?

- (a) Only one (b) Only two
(c) All three (d) None

Q81. Which of the following statements are correct in respect of PM e-Drive scheme?

1. It aims to support the procurement of electric vehicles such as e-buses, e-rickshaws, e-trucks, and e-ambulances.
2. It is focused only on metro cities and does not include rural or semi-urban regions.
3. It is part of the government's broader push towards cleaner and sustainable mobility through alternative fuels and technologies.

Select the answer using the code given below:

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

Q82. Consider the following with reference to 'India-South Korea Relations':

1. The Comprehensive Economic Partnership Agreement (CEPA) between India and South Korea was signed in 2009 and came into effect in 2010.
2. South Korea is a member of the Quadrilateral Security Dialogue (Quad) alongside India, Japan, Australia, and the United States.
3. India and South Korea have established a Special Strategic Partnership since 2015.
4. South Korea is collaborating with India on infrastructure projects under the "Korea Plus" initiative to promote Korean investment in India.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q83. The CAG (Comptroller and Auditor General) is known as friend, philosopher, and guide of the:

- (a) President (b) Prime Minister
(c) Finance Minister (d) Public Accounts Committee

Q84. What does the term "Mayday" signify in aviation and maritime communication?

- (a) A greeting used by pilots
(b) A signal for good weather
(c) A distress call indicating an emergency
(d) A command to change direction

Q85. Consider the following with reference to Ballistic Missiles:

1. Ballistic missiles follow a projectile path and are powered throughout their entire flight.
2. Agni-V, an Indian missile, is an intercontinental ballistic missile (ICBM) with a range exceeding 5,000 km.
3. Unlike cruise missiles, ballistic missiles typically exit the Earth's atmosphere during flight.
4. Submarine-launched ballistic missiles (SLBMs) like K-4 enhance second-strike capability.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q86. The "Rising Lion" operation marked a significant point in the historical trajectory of which ancient conflict?

- (a) Arab-Jewish conflict
(b) Israel-Palestine dispute
(c) Jewish-Persian conflict
(d) Sunni-Shia sectarian struggle

Q87. Consider the following statements with reference to Battle of Tallikota

1. It was fought between the Vijayanagara Empire and the Deccan Sultanates.
2. It was fought in Rakkasagi-Tangadigi and Bannihatti, all on the banks of river Krishna

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q88. Integral Human Development (IHD) is best described as:

- (a) A focus on economic growth and infrastructure development only
(b) A military and political strategy for national progress
(c) A model that promotes overall well-being—physical, economic, social, cultural, and spiritual—of individuals and communities
(d) A system to increase population and consumer demand

Q89. Consider the following with reference to the performance in the Global Gender Gap Index 2025:

1. India ranked 131 out of 148 countries, dropping two positions from the previous year.
2. The political empowerment subindex showed an improvement due to the passing of the Women's Reservation Bill.
3. India showed positive movement in the economic participation and opportunity subindex due to a rise in earned income parity.
4. Female representation in ministerial positions has increased since 2023.

Which of the statements given above are correct?

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

Q90. Consider the following with reference to 'Strait of Malacca':

1. The Strait of Malacca connects the Andaman Sea and the South China Sea.
2. It is one of the busiest maritime trade routes in the world, especially for oil and gas shipments.
3. The Strait lies between the Malay Peninsula and the Indonesian island of Sumatra.
4. The strait is entirely under the territorial waters of Malaysia.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) Only three (d) All four

Q91. Consider the following statements with reference to DNA identification

1. DNA from hard tissues like bones and teeth degrades faster than that from soft tissues.
2. Every human being, including identical twins, has a unique DNA.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q92. Consider the following statements

1. In *Swaraj Abhiyan v. Union of India* (2016), the Supreme Court ruled that lack of funds is no excuse for not fulfilling constitutional or statutory duties.
2. The MGNREGA recognises employment as a statutory right.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q93. The Sinai Peninsula forms a land bridge between which two continents?

- (a) Asia and Africa (b) Europe and Africa
(c) Asia and Europe (d) Africa and Australia

Q94. Consider the following with reference to the powers of the Election Commission of India w.r.t by-elections:

1. It can cancel an election in a constituency if it finds malpractices that vitiate the process at by-elections.

2. It has the power to de-register a political party if it violates the Model Code of Conduct in state by-elections.

3. It can advise the President or Governor on disqualifications under the Tenth Schedule.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q95. Consider the following statements

1. The Global Goal on Adaptation (GGA) was established under the Paris Agreement.

2. It is an attempt to identify a common global goal on adaptation, just like keeping temperatures below the 1.5 degrees Celsius threshold is a global goal on mitigation.

Which of the above statements are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q96. Consider the following statements:

Statement I: Obstructive Sleep Apnoea (OSA) leads to repeated interruptions in breathing during sleep.

Statement II: Warmer climate can worsen the symptoms of OSA.

Which of the following options is true?

- (a) Both statements are correct, and Statement II is the correct explanation for Statement I.
(b) Both statements are correct, but Statement II is NOT the correct explanation for Statement I.
(c) Statement I is correct, but Statement II is incorrect.
(d) Both statements are incorrect.

Q97. Consider the following statements with reference to Green India Mission

1. It is one of the eight Missions under the National Action Plan on Climate Change (NAPCC).

2. Activities under the Green India Mission are carried out together with MGNREGA, CAMPA, and the National Afforestation Programme (NAP).

Which of the above statements are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q98. Where was the largest automobile Gati Shakti Multi-Modal Cargo Terminal (MMCT) recently inaugurated?

- (a) Mumbai (b) Manesar
(c) Kolkata (d) Chennai

Q99. Which of the following statements are correct in respect of the Government e-Marketplace (GeM):

1. It is a one-stop online platform under the Ministry of Finance for public procurement in India.
2. GeM allows central and state government departments, PSUs, and autonomous bodies to procure goods and services.
3. The portal is designed to enhance transparency, efficiency, and speed in public procurement.

Select the answer using the code given below:

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

Q100. The International Civil Aviation Organization (ICAO) was established under which of the following international agreements?

- (a) Chicago Convention, 1944
(b) Paris Convention, 1919
(c) Montreal Protocol, 1987
(d) Geneva Convention, 1949

Q101. Consider the following with reference to the India-Croatia bilateral engagements:

1. Indian Naval ships have made port calls to Croatia, indicating growing defence ties.
2. Croatia is a member of the European Union and NATO.
3. India and Croatia have signed a Free Trade Agreement under the India-EU framework.

How many of the above is/are correct?

- (a) Only one (b) Only two
(c) All three (d) None

Q102. Which of the following initiatives is not associated with the Quad?

- (a) Indo-Pacific Maritime Domain Awareness (IPMDA)

- (b) Blue Dot Network
(c) Quad Fellowship Program
(d) AUKUS Security Pact

Q103. Consider the following statements with reference to The Aravali Range

1. The Range extends from Gujarat to Delhi through Rajasthan.
2. They are divided into two main ranges i.e. the Sambhar Sirohi Range and the Sambhar Khetri Range.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Q104. India launched Operation Sindhu to:

- (a) Provide humanitarian aid in Afghanistan
(b) Evacuate Indian nationals from Iran
(c) Conduct a military exercise with Canada
(d) Build a dam on the Chenab River.

Q105. Consider the following with reference to the Unlawful Activities (Prevention) Act (UAPA):

1. The Act empowers the central government to designate both organisations and individuals as terrorists.
2. Under the UAPA, an accused person can be detained up to 180 days without filing a charge sheet.
3. The National Investigation Agency (NIA) is the only agency authorised to investigate UAPA offences.
4. UAPA cases are tried in special courts established under the National Investigation Agency Act.

Which of the statements given above are correct?

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

Q106. Consider the following with reference to the Organisation of Islamic Cooperation (OIC):

1. The OIC is the world's second-largest intergovernmental organization after the United Nations.
2. The organisation was established in response to the 1969 arson attack on the Al-Aqsa Mosque in Jerusalem.
3. The OIC's official languages are Arabic, English, and French.

How many of the above is / are correct?

- (a) Only one (b) Only two
- (c) All three (d) None

Q107. Consider the following statements with reference to Critical Minerals

1. Cobalt comes almost exclusively from Congo.
2. Indonesia dominates the mining of nickel.
3. Sixty-six per cent of the processing of critical minerals takes place in China.

How many of the above statements is / are correct?

- (a) Only one (b) Only two
- (c) All three (d) None

Q108. Which factor most significantly affects the efficiency of geological carbon sequestration?

- (a) Surface temperature
- (b) Type of vegetation above the site
- (c) Porosity and permeability of the rock formation
- (d) Wind speed at the injection site

Answer Key

Q1.	b	Q2.	b	Q3.	c	Q4.	c	Q5.	d
Q6.	c	Q7.	a	Q8.	d	Q9.	c	Q10.	c
Q11.	a	Q12.	a	Q13.	d	Q14.	c	Q15.	a
Q16.	c	Q17.	b	Q18.	b	Q19.	c	Q20.	c
Q21.	d	Q22.	c	Q23.	a	Q24.	d	Q25.	c
Q26.	c	Q27.	a	Q28.	a	Q29.	c	Q30.	c
Q31.	c	Q32.	d	Q33.	b	Q34.	c	Q35.	d
Q36.	b	Q37.	d	Q38.	a	Q39.	a	Q40.	b
Q41.	c	Q42.	b	Q43.	c	Q44.	c	Q45.	b
Q46.	d	Q47.	b	Q48.	c	Q49.	d	Q50.	a
Q51.	c	Q52.	c	Q53.	a	Q54.	d	Q55.	c
Q56.	c	Q57.	a	Q58.	c	Q59.	b	Q60.	a
Q61.	a	Q62.	a	Q63.	c	Q64.	b	Q65.	d
Q66.	b	Q67.	a	Q68.	b	Q69.	b	Q70.	c
Q71.	a	Q72.	b	Q73.	c	Q74.	a	Q75.	a
Q76.	c	Q77.	b	Q78.	a	Q79.	c	Q80.	d
Q81.	c	Q82.	c	Q83.	d	Q84.	c	Q85.	c
Q86.	c	Q87.	c	Q88.	c	Q89.	a	Q90.	c
Q91.	d	Q92.	c	Q93.	a	Q94.	a	Q95.	a
Q96.	b	Q97.	c	Q98.	b	Q99.	b	Q100.	a
Q101.	b	Q102.	d	Q103.	c	Q104.	b	Q105.	c
Q106.	c	Q107.	c	Q108.	c				

For Detailed Explanation

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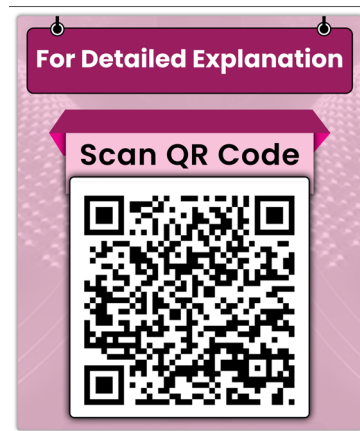


DAILY MAINS ANSWER WRITING PRACTICE

- Q1. What is Carbon Capture Usage and Storage (CCUS) technology and its various stages? Evaluate its feasibility in helping India achieve its net-zero emissions goal. (GS 3, 15 Marks, 250 Words)
- Q2. With China's asserting claims in the South China Sea leading to disputes around the South China Sea, how can India's Act East policy and outreach in the Indo-Pacific can influence regional stability and balance of power? (GS2, 10 Marks, 150 Words)
- Q3. How was the approach of Mahatma Gandhi different from that of Dr. Ambedkar towards caste and social reforms? How did their different philosophies shape their methods and visions for achieving social justice in India? (GS 1, 15 Marks, 250 Words)
- Q4. Discuss the interplay between demand-pull and cost-push inflation by explaining how both of them can influence each other and contribute to a continuous rise in prices. (GS 3, 10 Marks, 150 Words)
- Q5. Discuss various climate finance mechanisms under United Nations Framework Convention on Climate Change (UNFCCC). What is the significance of climate finance for climate action? (GS 3, 15 marks, 250 Words)
- Q6. Urban migration among educated, working women is challenging the traditional notions of womanhood and kinship in India. Comment. (GS 1, 15 Marks, 250 Words)
- Q7. What are the systemic factors that contribute to and perpetuate the gender gap in the judiciary? Discuss measures to effectively enhance inclusive and representative judicial participation in India. (GS 2, 15 Marks, 250 Words)
- Q8. ENSO is one of the most important climate phenomena on Earth due to its ability to change the global atmospheric circulation. Explain the phenomenon of El Niño Southern Oscillation (ENSO). Write a short note on Oceanic Nino index (ONI). (GS 1, 10 Marks, 150 Words)

- Q9. What is direct seeded rice and how does it compare to puddled transplanted rice? Highlight the advantages and constraints of direct seeding. (GS 3, 15 Marks, 250 Words)
- Q10. It is observed that the RBI generally remains sceptical on reducing the interest rates due to high food prices. What are the cause and implications of food inflation in India? Discuss the measures taken by government to control food inflation. (GS 3, 15 Marks, 250 Words)
- Q11. What is the census and its significance? Discuss the history, potential issues and benefits associated with a caste census in India. (GS 1, 15 Marks, 250 Words)
- Q12. Critically examine the office of National Security Advisor (NSA) in the current national security framework. (GS 3, 10 Marks, 150 Words)
- Q13. What are the main sources of anthropogenic methane emissions? Discuss how international climate change agreements address methane emissions and what are their limitations. (GS 3, 15 Marks, 250 Words)
- Q14. Highlight the significance of India-Middle East-Europe Economic Corridor for India. Write a note on the challenges that can hinder its success. (GS 2, 15 Marks, 250 Words)
- Q15. What are endangered languages, elucidate with examples in India? Discuss the national and international initiatives in place to protect such languages. (GS 1, 15 Marks, 250 Words)
- Q16. What is ozone layer depletion and why is the depletion to ozone layer harmful? Discuss the significance of Montreal Protocol in addressing the ozone layer depletion. (GS1, 15 Marks, 250 Words)
- Q17. How do human activities drive widespread ecological degradation and biodiversity loss globally? Discuss the challenges in implementing ecological restoration efforts worldwide. (GS 3, 15 Marks, 250 Words)
- Q18. The recent stampede in Bengaluru highlights the need for effective crowd management in India. Discuss the factors leading to stampedes and ways for effective crowd management during mass gatherings. (GS 1 and 3, 15 Marks, 250 Words)
- Q19. Discuss the role of oceans in sustaining life and regulating Earth's systems. How do global climate change and human activities threaten ocean health and sustainability? (GS 3, 15 Marks, 250 Words)

- Q20. How is a denial-of-service (DoS) attack different from a distributed denial of service (DDoS) attack? Discuss the ways in which DoS attacks are carried and ways to deal with such attacks. (GS 3, 10 Marks, 150 Words)
- Q21. Canada has invited India to the G7 summit. Discuss the need for Group of Seven (G7) to revamp itself in the contemporary world. What is the significance of G7 for India? (GS 2, 15 Marks, 250 Words)
- Q22. Describe Monetary Policy in India. What are the major instruments of monetary policy employed by the Reserve Bank of India? (GS 3, 15 Marks, 250 Words)
- Q23. What strategies can be adopted to facilitate adoption of sustainable practices by the Micro, Small & Medium Enterprises (MSMEs) in India? (GS 3, 15 Marks, 250 Words)
- Q24. What is the significance of Gulf region in India's energy security? Discuss the factors that contribute to the continued significance of the Gulf region in India's energy security. (GS 2, 15 Marks, 250 Words)
- Q25. How is India's defence strategy balancing its continental challenges with maritime ambitions in the Indian Ocean Region? (GS 2, 10 Marks, 150 Words)
- Q26. How has India's engagement strategy with Central Asia evolved in recent years? What are the key drivers behind India's shifting focus to development-centric cooperation? (GS 2, 15 Marks, 250 Words)
- Q27. Discuss the significance of space agriculture. What are the challenges and limitations associated with growing plants in space? (GS 3; 10 Marks; 150 Words)



Note



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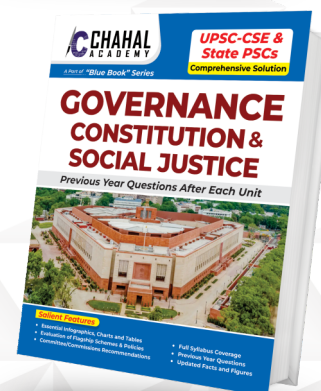
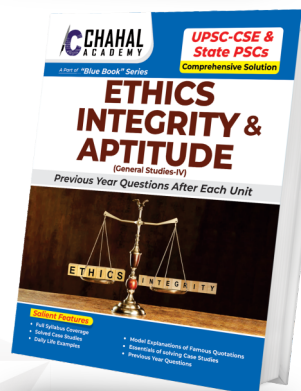
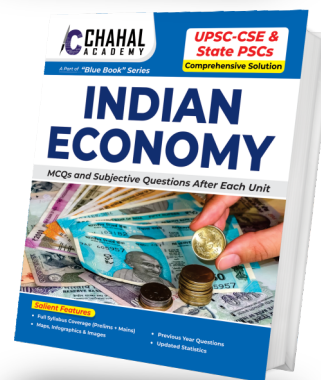
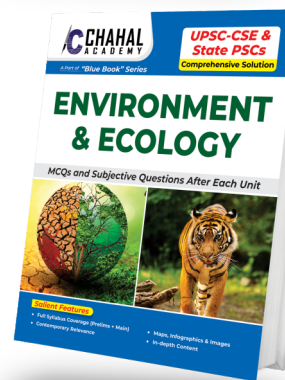
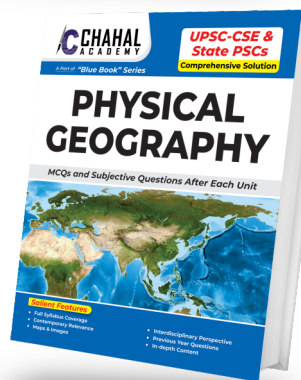
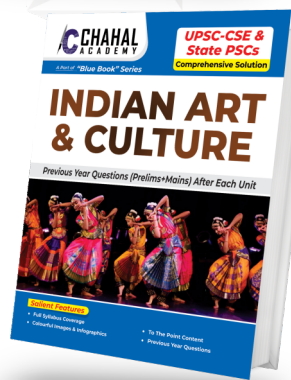
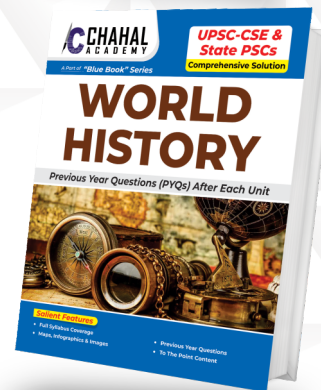
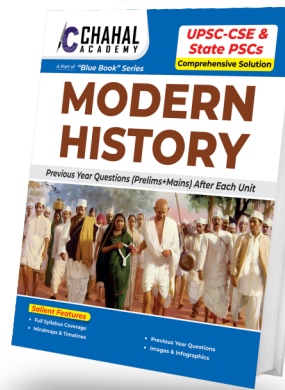
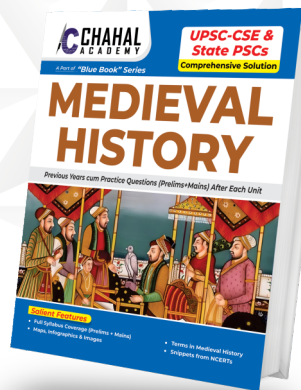
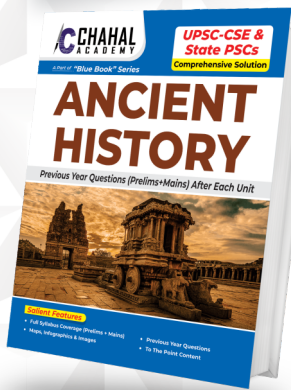
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