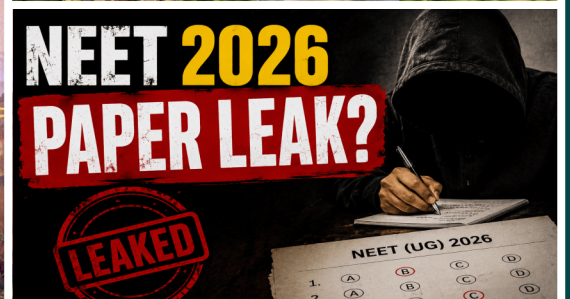


CURRENT AFFAIRS

For Integrated Preparation of CSE Prelims + Mains + Interview



Special Feature

Monthly MCQs

MAY

from

THE  HINDU



The Indian **EXPRESS**
JOURNALISM OF COURAGE

*MCQs on Prelims Latest Pattern

- India–Italy Relations
- Kaziranga National Park
- Bundibugyo Virus Outbreak
- TARA Glide Weapon System
- Sugarcane FRP Hike 2026-27
- Coal Gasification Scheme 2026
- DRDO Successfully Tests UPLGGM-V3 Missile

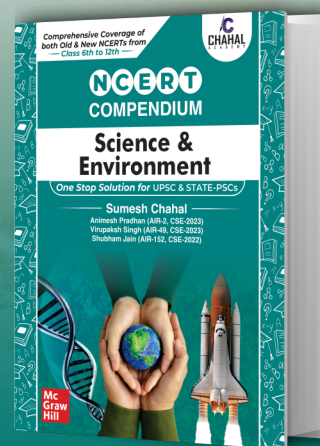
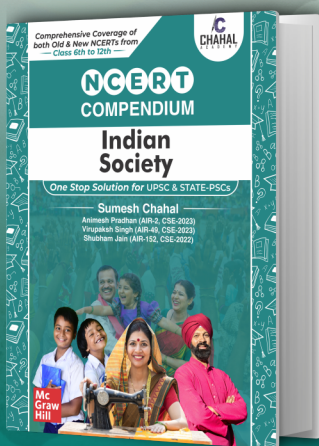
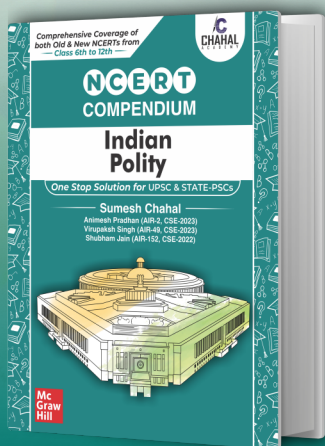
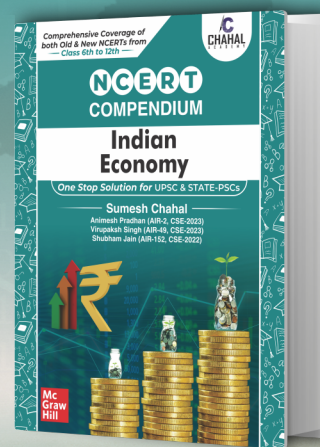
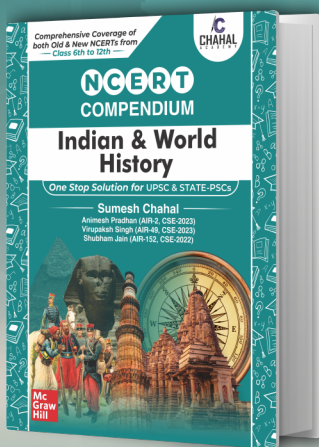
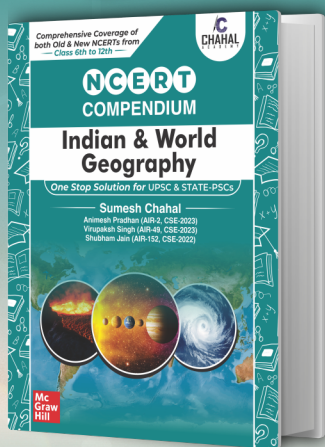
- NEET-UG 2026 Paper Leak
- Maharana Pratap Jayanti
- Bhojshala Temple Dispute
- NCRB Crime in India Report 2024
- Acid Attack Victims under RPwD Act, 2016
- NFHS-6: Rising Burden of Obesity and Diabetes in India
- School Management Committee (SMC) Guidelines, 2026

NCERT Compendium

By Chahal Academy

“Our NCERT Compendium Series addresses the problem of reading multiple NCERT books of different classes for the same subject. This Compendium Series will help students in covering the NCERTs in less time and also in assessing their performance by providing practice questions after each unit.”

All Books in Chahal NCERTs Compendium Series



Contents

POLITY & GOVERNANCE	3
Legal Status of Vande Mataram and National Symbols.....	4
FCRA Amendment Bill, 2026 and Regulation of Foreign Funding.....	6
Federalism in India – Building Consensus for Reform	7
How B. R. Ambedkar Shaped India's Modern Labour Laws.....	8
Labour Codes Fully Operationalised.....	9
INTERNATIONAL RELATIONS	11
Strait of Hormuz Crisis and India's Energy Security	11
India–Italy Relations.....	12
India–Norway Relations.....	14
India–Vietnam Relations	16
India-Nepal Border Row Resurfaces	19
India–Norway Relations.....	21
India–South Korea Defence Ties	23
11th Quad Foreign Ministers' Meeting (FMM) .	25
UAE's Exit from OPEC.....	27
India's Diplomatic Summer	29
Maritime Security in an Era of West Asian Conflict.....	31
ECONOMY & AGRICULTURE	34
Fiscal Health and Electoral Outcomes	34
RBI Promotion Policy.....	36
Mission for Cotton Productivity.....	37
Periodic Labour Force Survey (PLFS) 2025	39
Coal Gasification Scheme 2026	41
RBI's Intervention to Defend the Rupee.....	43
PM-WANI Gets Citizen-Friendly Upgrade	46
Two New Special Economic Zones (SEZs) in Puducherry	48
Union Finance Minister Flags '3F' Concerns – Fuel, Fertiliser and Foreign Exchange	50
Mission Arunachal Kiwi.....	52
ILO Complaint by Tea Workers and Labour Rights Protection	53
Sugarcane FRP Hike 2026-27	54
Roadmap for Fertiliser Reforms.....	54
ENVIRONMENT & GEOGRAPHY	57
AMOC Collapse and Its Implications for India's Climate Security.....	57
Changing Air Pollution Patterns – Rise of Ground-Level Ozone	58
Water Budgeting in Rural India	60
Ecocide and International Law.....	62
SO ₂ Mitigation from Coal-Based Power Plants	64
India's Abstention on UNGA Climate Resolution.....	66
Illegal Sand Mining in National Chambal Sanctuary.....	67
World Metrology Day 2026	70
Kaziranga National Park	72
India's Invasive Species Crisis	72
New Evergreen Tree Species Discovered in Kerala.....	74
Barn Swallow	74
Supreme Court Review of Wetland Conservation Rules, 2017	75
Wetlands (Conservation and Management) Rules, 2017	75
SCIENCE & TECHNOLOGY	76
Hantavirus Outbreak.....	76
India's First Orbital Data Centre Satellite: Pathfinder	78
Bundibugyo Virus Outbreak.....	79
Fractional Quantum Hall Effect (FQHE).....	81
Synthetic “Learning” Metamaterials	83
DEFENCE & SECURITY	85
TARA Glide Weapon System	85
DRDO Successfully Tests ULPGM-V3 Missile	87

BSF's First All-Women Everest Expedition	88
I4C Alert on Apple iPhone Phishing Scam	89
Oreshnik Missile	90
Captagon and Himachal Pradesh's Anti-Heroin Model	90
SOCIAL ISSUES	93
Supreme Court Expands Definition of Acid Attack Victims under RPwD Act, 2016.....	93
School Management Committee (SMC) Guidelines, 2026	94
NITI Aayog's Roadmap for Quality Education	96
NEET-UG 2026 Paper Leak	98
NFHS-6: Rising Burden of Obesity and Diabetes in India	100
PMOS (Earlier PCOS)	102
HISTORY & CULTURE	103
Bhojshala Temple Dispute and Heritage Conservation	103
GOVERNMENT SCHEMES	105
JANANI	105
PM-AJAY Portal & AJAY Mobile App	106
SARTHAK-PDS Scheme.....	107
PMGSY-IV – Transforming Rural Connectivity in India	108
Bharat Audyogik Vikas Yojna (BHAVYA)	109
IMPORTANT REPORTS	112
NCRB Crime in India Report 2024	112
International Big Cat Alliance (IBCA) Summit 2026	113
Personalities in News	116
Rabindranath Tagore Jayanti 2026.....	116
Maharana Pratap Jayanti	117
Raja Rammohan Roy	118
MISCELLANEOUS.....	121
Padma Awards – India's Civilian Honours System	121
Daily MCQs from The Hindu & Indian Express (May 2026).....	123
Daily MCQs Practice.....	123

POLITY & GOVERNANCE

Budget Session 2026

Why in News: The Budget Session 2026 (28 January–18 April) concluded with the passage of six Bills out of ten introduced, while three important Bills remained pending or were negatived, raising questions about legislative scrutiny and parliamentary productivity.

Key Details

- **Six Bills were passed during the session:** These covered social justice, labour reforms, insolvency, decriminalisation, and administrative reforms.
- **Three major Bills remain on the backburner:** These include the Corporate Laws (Amendment) Bill, FCRA Amendment Bill, and the Constitution (131st Amendment) Bill on Delimitation.
- **The session witnessed substantial legislative output:** However, concerns have been raised over inadequate debate time and limited committee scrutiny.
- **Parliamentary productivity needs to balance quantity with quality:** Legislative efficiency should not come at the cost of detailed examination and stakeholder consultation.

Legislative Process in Parliament

- **A Bill becomes law after passage by both Houses and Presidential assent.**
 - The process ensures deliberation, accountability, and democratic participation.
- **Standing Committees examine Bills in detail.**
 - They provide expert inputs and improve the quality of legislation.
- **Joint Committees are constituted for complex Bills when necessary.**
 - These committees facilitate broader political consensus and scrutiny.
- **Money Bills follow a special procedure under Article 110.**
 - The Rajya Sabha has limited powers with respect to Money Bills.

Major Bills Passed During Budget Session 2026

- **Transgender Persons (Protection of Rights) Amendment Bill, 2026.**
 - It strengthens safeguards provided after the NALSA judgment and expands anti-discrimination provisions.
- **Jan Vishwas (Amendment of Provisions) Bill, 2026.**
 - It extends decriminalisation to several minor offences and promotes ease of doing business.
- **Industrial Relations Code (Amendment) Bill, 2026.**
 - It clarifies labour code provisions and strengthens dispute resolution mechanisms.
- **IBC (Amendment) Bill, 2025.**

- It improves insolvency resolution timelines and introduces stronger cross-border insolvency provisions.

Important Bills Passed in Budget Session 2026

- **Transgender Persons Amendment Bill, 2026** – Social Justice
- **Jan Vishwas Amendment Bill, 2026** – Decriminalisation and Ease of Doing Business
- **Industrial Relations Code Amendment Bill, 2026** – Labour Reforms
- **IBC Amendment Bill, 2025** – Insolvency Framework
- **CAPF (General Administration) Bill, 2026** – Administrative Reforms
- **Andhra Pradesh Reorganisation (Amendment) Bill, 2026** – Cooperative Federalism

Committee System and Parliamentary Scrutiny

- **Department-related Standing Committees improve legislative quality.**
 - They enable detailed examination beyond political debates in Parliament.
- **Committee referral has declined in recent years.**
 - This raises concerns regarding transparency and stakeholder participation.
- **Debate time per Bill averaged around three hours.**
 - Such limited discussion may affect the quality of law-making.
- **Parliamentary committees act as mini-Parliaments.**
 - They strengthen legislative oversight and democratic accountability.

Pending and Negatived Bills

- **Corporate Laws (Amendment) Bill, 2026 is under Joint Committee scrutiny.**
 - It seeks to modernise corporate governance and disclosure norms.
- **FCRA Amendment Bill, 2026 remains pending.**
 - The Bill aims to further regulate foreign funding and NGO activities.
- **Constitution (131st Amendment) Bill on Delimitation was negatived.**
 - This has delayed progress on delimitation-related reforms.
- **Several key reforms are expected to return in future sessions.**
 - Broader political consensus will be crucial for their passage.

Decriminalisation as Governance Reform

- **Jan Vishwas reforms aim to reduce unnecessary criminal provisions.**
 - This helps improve ease of doing business and reduces judicial burden.

- **Minor offences are increasingly being converted into civil penalties.**
 - This reflects a shift towards trust-based governance.
- **Decriminalisation supports economic efficiency.**
 - It encourages compliance rather than punitive enforcement.
- **The reform aligns with global best practices.**
 - It promotes regulatory simplification and investor confidence.

Federalism and Cooperative Governance

- **The Andhra Pradesh Reorganisation Amendment addresses post-bifurcation issues.**
 - It deals with revenue deficits and institutional arrangements.
- **Centre-State cooperation remains essential for balanced development.**
 - Federal harmony is necessary for effective implementation.
- **Delimitation remains a politically sensitive issue.**
 - It affects representation and the balance between states.
- **Consensus-building is critical for constitutional reforms.**
 - Broad-based consultations enhance legitimacy and acceptance.

Parliament and Committee System – Key Facts for Prelims

- ✓ **Article 107** – Introduction and passage of Bills.
- ✓ **Article 110** – Money Bills.
- ✓ **Article 111** – President’s assent to Bills.
- ✓ **Department-related Standing Committees** – Established in 1993.
- ✓ **Joint Parliamentary Committee (JPC)** – Ad hoc committee for specific matters.

Way Forward

- **Committee scrutiny should become the norm for major Bills.**
 - This will improve legislative quality and stakeholder participation.
- **Minimum debate time may be prescribed for important legislation.**
 - Adequate discussion strengthens parliamentary democracy.
- **Pre-legislative consultations should be institutionalised.**
 - Public participation increases transparency and acceptability.
- **Parliamentary productivity should focus on quality as well as quantity.**
 - Effective law-making requires both speed and scrutiny.

Conclusion

Budget Session 2026 demonstrated strong legislative throughput but highlighted concerns regarding

parliamentary scrutiny and debate quality. Strengthening the committee system and ensuring wider consultations are essential for improving the effectiveness and credibility of the legislative process.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the legislative process in India, consider the following statements:

1. Every Bill introduced in Parliament must necessarily be referred to a Department-related Standing Committee.
2. Money Bills are defined under Article 110 of the Constitution.
3. A Bill becomes law only after receiving the assent of the President.

How many of the above statements are incorrect?

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

Answer: (a)

Legal Status of Vande Mataram and National Symbols

Why in News: The Union Cabinet has approved granting **Vande Mataram** legal protection equivalent to **Jana Gana Mana**, bringing it under the ambit of the Prevention of Insults to National Honour Act, 1971.

Key Details

- **Legal parity granted:** Disrespect to Vande Mataram will attract penalties similar to those applicable to the National Anthem. This removes the long-standing distinction between the national song and the national anthem.
- **Constituent Assembly intent codified:** The 1950 declaration by Dr. Rajendra Prasad is now backed by statutory protection. It resolves a legal ambiguity that existed since Independence.
- **Constitutional significance:** The move reinforces respect for national symbols under Fundamental Duties. It also revives debates on patriotism and freedom of conscience.

Historical Evolution of Vande Mataram

- **Origin:** Vande Mataram was composed by Bankim Chandra Chattopadhyay in 1875 and later included in *Anandamath* (1882). It became an important symbol of India's national movement.
- **Political significance:** Rabindranath Tagore first sang it at the 1896 Calcutta session of the Indian National Congress. The song inspired nationalist sentiments during the freedom struggle.
- **Limited adoption:** In 1937, the Congress Working Committee accepted only the first two stanzas for

national use. This was done to address concerns regarding the later verses.

the song. Implementation should remain inclusive and sensitive.

National Symbols and Constitutional Framework

- **Constituent Assembly Declaration (1950):** Jana Gana Mana was adopted as the National Anthem and Vande Mataram as the National Song. Both were intended to enjoy equal honour and dignity.
- **Article 51A(a): Fundamental Duty:** Citizens are required to respect the Constitution, National Flag and National Anthem. The provision promotes constitutional patriotism and national unity.
- **Prevention of Insults to National Honour Act, 1971:** The Act penalises disrespect towards the National Flag, Constitution and National Anthem. The recent move extends similar protection to the National Song.

National Anthem vs National Song

National Anthem: Jana Gana Mana	National Song: Vande Mataram
Adopted on 24 January 1950	Recognised on 24 January 1950
Written by Rabindranath Tagore	Written by Bankim Chandra Chattopadhyay
Protected under Prevention of Insults to National Honour Act, 1971	Similar legal protection proposed
Symbol of national unity	Symbol of freedom movement

Fundamental Duties (Part IVA)

- Added by the **42nd Constitutional Amendment Act, 1976**.
- Derived from the Constitution of the former USSR.
- Enumerated under **Article 51A**.
- Promote constitutional values, patriotism and civic responsibility.
- Non-justiciable but important for governance and citizenship.

Way Forward

- **Clear legal definitions:** The meaning of "insult" should be narrowly defined. This will prevent misuse and unnecessary criminalisation.
- **Protect freedom of conscience:** Implementation should respect Supreme Court rulings. Patriotism must remain voluntary and constitutional.
- **Promote constitutional values:** Awareness and civic education should be prioritised. Respect for national symbols should emerge from understanding rather than compulsion.

Judicial Perspective on Patriotism

- **Bijoe Emmanuel v. State of Kerala (1986):** The Supreme Court held that citizens cannot be compelled to sing the National Anthem. Freedom of conscience under Article 19 and Article 25 must be respected.
- **Shyam Narayan Chouksey Case (2017):** The Court emphasised that patriotism cannot be enforced through coercion. Respect for national symbols should arise from constitutional values rather than compulsion.

Conclusion

Granting legal protection to Vande Mataram fulfils the spirit of the Constituent Assembly's declaration and recognises its role in India's freedom struggle. However, balancing constitutional patriotism with individual freedoms will be essential for harmonious implementation.

Arguments in Favour

- **Constitutional intent fulfilled:** The move gives statutory backing to the Constituent Assembly's declaration. It removes the anomaly between equal honour and unequal legal protection.
- **Recognition of freedom struggle heritage:** Vande Mataram played a significant role in India's nationalist movement. Granting equal status acknowledges its historical importance.
- **Strengthening civic duties:** Legal protection reinforces citizens' responsibility towards national symbols. It promotes a shared sense of identity and nationhood.

Concerns and Challenges

- **Compulsion versus respect:** Legal protection should not result in forced singing or coercive patriotism. Constitutional freedoms must remain safeguarded.
- **Possibility of misuse:** Broad interpretations may lead to unnecessary litigation or vigilante actions. Clear definitions are required to avoid misuse.
- **Cultural sensitivities:** Certain sections have historically expressed reservations regarding parts of

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to Vande Mataram and national symbols, consider the following statements:

1. Vande Mataram was originally composed by Bankim Chandra Chattopadhyay and later included in *Anandamath*.
2. Article 51A(a) of the Constitution deals with Fundamental Duties relating to respect for national symbols.
3. In the Bijoe Emmanuel case, the Supreme Court held that citizens can be compelled to sing the National Anthem in the interest of national unity.

How many of the above statements are incorrect?

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

Answer: (a)

FCRA Amendment Bill, 2026 and Regulation of Foreign Funding

Why in News: The **Foreign Contribution (Regulation) Amendment Bill, 2026** remains pending in Parliament. It seeks to further shape India's framework governing foreign funding of NGOs and civil society organisations.

Key Details

- The proposed amendment comes after significant changes introduced through the FCRA Amendment Act, 2020. It reflects India's continued focus on balancing national security concerns with the functioning of civil society.
- More than 16,000 NGOs have lost FCRA registration since 2020 due to cancellations or non-renewal. This has raised concerns regarding shrinking civic space and regulatory overreach.
- The framework is also linked to India's commitments under the Financial Action Task Force (FATF). The objective is to prevent money laundering and terror financing through non-profit entities.

Foreign Contribution Regulation Act (FCRA): Evolution and Objectives

- **FCRA, 1976:** Enacted to regulate foreign contributions to individuals and associations. The Act aimed to safeguard national sovereignty and prevent external influence in domestic affairs.
- **FCRA, 2010:** Replaced the 1976 Act and introduced mandatory registration renewal every five years. It prohibited foreign contributions to election candidates, judges, government servants and political parties.
- **FCRA Amendment Act, 2020:** Introduced stricter provisions to enhance transparency and accountability. It prohibited sub-granting, reduced the administrative expense limit and centralized FCRA accounts.

Important Provisions of FCRA Amendment, 2020

- **Ban on Sub-Granting:** FCRA-registered organisations cannot transfer foreign funds to another organisation. This was aimed at improving traceability of foreign contributions.
- **Administrative Expense Cap:** Administrative expenditure was reduced from 50% to 20%. The provision intends to ensure that a larger share of funds reaches beneficiaries.
- **Single SBI Account Requirement:** All FCRA funds must be received through SBI Main Branch, New Delhi. This facilitates centralized monitoring and better regulatory oversight.
- **Mandatory Identification:** Aadhaar identification for office bearers was made compulsory. The objective is to improve transparency and prevent misuse.

Persons Prohibited from Receiving Foreign Contributions
<ul style="list-style-type: none"> • Section 3 of FCRA, 2010 <ul style="list-style-type: none"> ✓ Election candidates

<ul style="list-style-type: none"> ✓ Members of Parliament and State Legislatures ✓ Political parties and office-bearers ✓ Judges and government servants ✓ Organisations of political nature

Need for Regulation of Foreign Funding

- **National Security Concerns:** Foreign funding can potentially be misused for activities affecting sovereignty and public order. Regulation helps prevent terror financing and illicit financial flows.
- **Compliance with FATF Standards:** FATF recommends risk-based monitoring of the non-profit sector. Strong regulations improve India's global credibility and financial integrity.
- **Transparency and Accountability:** Proper disclosure mechanisms ensure effective utilisation of foreign contributions. They also reduce possibilities of misuse and diversion of funds.

Concerns Associated with the Existing Framework

- **Shrinking Civic Space:** Restrictions have adversely affected grassroots organisations and advocacy groups. Many NGOs dependent on collaborative funding mechanisms face operational challenges.
- **High Compliance Burden:** Minor procedural lapses have resulted in cancellation of registrations. This has raised concerns regarding proportionality and ease of compliance.
- **Impact on Research and Development Activities:** Think tanks and research institutions have faced funding constraints. This may affect independent policy research and developmental initiatives.

Financial Action Task Force (FATF) and India

- **FATF** is an intergovernmental body established in 1989 to combat money laundering and terror financing. It develops international standards to safeguard the global financial system.
- India became a member of FATF in 2010. The 2024 Mutual Evaluation Report emphasised a risk-based approach towards the non-profit sector.

Constitutional Dimensions

- **Article 19(1)(c)** guarantees the right to form associations and unions. Reasonable restrictions can be imposed in the interest of sovereignty and integrity of India.
- Regulation should strike a balance between security concerns and democratic freedoms. An excessive compliance framework may affect the functioning of civil society institutions.

Way Forward

- **Risk-Based Regulation:** Differentiate between high-risk and low-risk entities instead of imposing blanket restrictions. This will improve efficiency without hampering genuine developmental work.

- **Restoration of Controlled Sub-Granting:** Allow fund transfers with robust audit mechanisms. This would strengthen grassroots organisations and local implementation capacity.
- **Independent Appellate Mechanism:** Separate regulatory and adjudicatory functions. This will improve transparency and ensure procedural fairness.

Conclusion

FCRA remains a crucial instrument for regulating foreign funding and safeguarding national security. However, the challenge lies in maintaining a balance between financial integrity and preserving the autonomy of civil society institutions.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the Foreign Contribution (Regulation) Act (FCRA), consider the following statements:

1. The FCRA Amendment Act, 2020 prohibited transfer of foreign contributions from one FCRA-registered organisation to another.
2. Members of Parliament are prohibited from receiving foreign contributions under the FCRA, 2010.
3. India became a member of the Financial Action Task Force (FATF) in 2020.

How many of the above statements are incorrect?

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

Answer: (a)

Federalism in India – Building Consensus for Reform

Why in News: Recent debates over delimitation and constitutional reforms have revived concerns regarding the changing nature of Indian federalism and the need to balance representation, fiscal equity, and cooperative governance.

Key Details

- **Federalism in India is dynamic and evolving.** It combines a strong Centre with autonomous States, adapting to changing political and economic realities.
- **Growing concerns over democratic representation have emerged.** Population changes and the freeze on parliamentary seats have intensified debates over fair representation.
- **Regional economic disparities are shaping Centre-State relations.** Variations in development and revenue generation have increased demands for greater fiscal and political autonomy.

Federalism in India

- **Constitutional Basis:** India follows a quasi-federal structure with unitary features. The Seventh Schedule divides powers between the Union and States through Union, State, and Concurrent Lists.
- **Cooperative Federalism:** It promotes collaboration between different levels of government for policy formulation and implementation. Institutions like the GST Council embody this principle.
- **Competitive Federalism:** States compete to attract investment and improve governance. This encourages innovation and economic efficiency.
- **Emerging Challenges:** Increasing political polarization and centralization have led to concerns regarding the erosion of cooperative federalism.

Democratic Deficit and Delimitation

- **Meaning:** Democratic deficit refers to the mismatch between population share and parliamentary representation. The freeze based on the 1971 Census has widened this gap.
- **Regional Concerns:** States with successful population control fear losing representation. Faster-growing states seek greater political representation in Parliament.
- **Constitutional Provision:** Delimitation is carried out under Articles 81 and 82 after every Census. The next exercise is expected after 2026.
- **Need for Balance:** Any reform should ensure fairness without discouraging demographic achievements.

Delimitation in India

- ✓ **Article 82:** Provides for readjustment of Lok Sabha seats after each Census.
- ✓ **42nd Constitutional Amendment (1976):** Froze seat allocation till 2001 to promote family planning.
- ✓ **84th Constitutional Amendment (2001):** Extended the freeze till 2026.
- ✓ **Delimitation Commission:** Independent body whose orders have the force of law and cannot be challenged in court.

Fiscal Federalism

- **Resource Sharing:** Fiscal transfers are aimed at reducing regional inequalities. The Finance Commission recommends tax devolution between the Centre and States.
- **Rising Tensions:** Economically stronger states often express concerns regarding disproportionate redistribution. They argue that better-performing states should not be penalized.
- **Vertical and Horizontal Imbalance:** States depend heavily on central transfers despite having major expenditure responsibilities. Balancing these asymmetries remains a challenge.
- **Need for Equity:** Fiscal federalism should promote both efficiency and inclusive development across regions.

Divergent State Performance

- **Economic Variations:** Southern and western states have generally recorded higher economic growth. Several northern states continue to lag in social and economic indicators.
- **Policy Implications:** Uneven development affects demands for representation and resource allocation. It also influences political discourse.
- **Governance Outcomes:** Better-performing states seek greater autonomy and incentives. Lagging states require enhanced support for balanced development.
- **Challenge to Unity:** Persistent disparities can intensify regional aspirations and political tensions.

Cooperative Federalism and Consensus Building

- **Democratic Sensibility:** Consultation, compromise, and trust are essential for maintaining federal harmony. Consensus-based governance strengthens national unity.
- **Role of Institutions:** Bodies like the Inter-State Council, Finance Commission, and GST Council facilitate dialogue and dispute resolution.
- **From Cooperation to Competition:** Excessive political confrontation may weaken collaborative governance and policy implementation.
- **Need for Trust:** Strong Centre-State relations are crucial for effective governance and inclusive growth.

Way Forward

- **Ensure balanced delimitation reforms** that protect both demographic achievements and democratic representation.
- **Strengthen institutions of cooperative federalism** through regular consultation and greater transparency.
- **Promote equitable fiscal transfers** while rewarding efficiency and good governance.
- **Encourage consensus-based decision-making** to preserve India's unity in diversity.

Conclusion

Federalism is the cornerstone of India's democratic framework. Addressing issues of representation, fiscal equity, and regional disparities through dialogue and consensus is essential to strengthen cooperative federalism and ensure balanced national development.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to federalism in India, consider the following statements:

1. The Seventh Schedule of the Constitution divides powers between the Union and States.
2. The Delimitation Commission's orders can be challenged before the Supreme Court.
3. The 84th Constitutional Amendment extended the freeze on Lok Sabha seat allocation till 2026.

How many of the above statements are incorrect?

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

Answer: (a)

How B. R. Ambedkar Shaped India's Modern Labour Laws

Why in News: As India commemorates the birth anniversary of B. R. Ambedkar, his contributions to labour welfare and social security have gained renewed attention. His reforms laid the foundation for India's modern labour legislation and welfare state.

Key Details

- Dr. Ambedkar served as Labour Member of the Viceroy's Executive Council from 1942-46. His tenure witnessed several landmark labour reforms that continue to influence labour policy.
- He viewed labour as a means for human dignity and self-development, not merely economic survival. His approach combined economic justice with social empowerment.
- He introduced measures related to working hours, social security and industrial relations. These reforms significantly improved workers' rights and welfare.

Ambedkar's Vision for Labour

- **Labour as Human Development:** Ambedkar believed labour should enable cultural, intellectual and social progress. He emphasized dignity and equal opportunities for workers.
- **Social Justice Approach:** He advocated protection of vulnerable workers and reduction of inequalities. His ideas later influenced the Directive Principles of State Policy.

Major Labour Reforms Introduced

- **Eight-Hour Workday:** Working hours were reduced from 12 hours to 8 hours. This aligned Indian labour standards with international practices.
- **Social Security Measures:** Provisions for maternity benefits, provident fund and paid leave were introduced. These measures improved the welfare and economic security of workers.
- **Recognition of Trade Unions:** Ambedkar supported collective bargaining and workers' representation. This strengthened industrial democracy and labour rights.
- **Employment Exchanges:** Institutional mechanisms were created to facilitate employment opportunities. These helped connect job seekers with employers efficiently.

Tripartite Labour Conference, 1942

- **First Institutional Dialogue Mechanism:** It brought together government, employers and employees on a

common platform. This promoted consensus-based industrial relations.

- **Foundation of Social Dialogue:** The conference institutionalized consultation in labour policymaking. It continues through the Indian Labour Conference framework.

Labour Investigation Committee, 1944

- **First Comprehensive Labour Survey Body:** It studied wages, living conditions and labour welfare issues. Its recommendations guided future labour policies and reforms.
- **Coverage of Neglected Sectors:** The committee highlighted problems faced by unorganized and vulnerable workers. This expanded the scope of labour welfare in India.

Constitutional Provisions Reflecting Ambedkar's Vision

- **Article 39:** Provides for adequate livelihood and equal pay for equal work. It aims to reduce economic disparities and ensure social justice.
- **Article 43:** Directs the State to secure living wages and decent working conditions. It promotes a dignified standard of life for workers.
- **Articles 39(b) and 39(c):** Advocate equitable distribution of resources and prevention of wealth concentration.
- These provisions seek to establish an egalitarian economic order.

Labour Codes, 2020

- **Four Labour Codes**
 - ✓ **Code on Wages, 2019:** It consolidates laws relating to wages and aims at universal minimum wages.
 - ✓ **Industrial Relations Code, 2020:** It governs trade unions, industrial disputes and conditions for layoffs.
 - ✓ **Code on Social Security, 2020:** It extends social security benefits to organized and unorganized workers.
 - ✓ **Occupational Safety, Health and Working Conditions Code, 2020:** It seeks to ensure safe and humane working conditions across sectors.

Significance for Modern India

- Ambedkar's reforms laid the foundation for labour welfare and industrial peace. They continue to guide labour legislation and social security frameworks.
- His emphasis on dignity, representation and social justice remains relevant in the era of gig economy and informal employment. These principles are crucial for inclusive economic growth.

Conclusion

Dr. B. R. Ambedkar's contribution to labour rights extended beyond legislative reforms to the idea of social and

economic justice. His vision continues to shape India's labour governance and welfare policies.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the contributions of Dr. B. R. Ambedkar towards labour welfare in India, consider the following statements:

1. During his tenure as Labour Member, the working hours were reduced from 12 hours to 8 hours.
2. The Tripartite Labour Conference brought together the government, employers and employees for consultation on labour issues.
3. Article 43 of the Constitution provides for equal pay for equal work for both men and women.

How many of the above statements are incorrect?

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

Answer: (a)

Labour Codes Fully Operationalised

Why in News: The Union Government has operationalised the four Labour Codes by notifying final rules, replacing 29 existing labour laws. The move aims to simplify labour regulations, but has raised concerns regarding workers' rights and wage protection.

Key Details

- The four Labour Codes cover wages, industrial relations, social security, and occupational safety. They seek to create a unified and simplified labour law framework.
- The government argues that the reforms will improve ease of doing business and formalise employment. Trade unions and opposition groups have criticised them for weakening labour protections.
- The Codes seek to expand social security coverage to gig and unorganised workers. However, concerns remain regarding implementation and adequacy of benefits.

Labour Reforms in India

- **Constitutional Basis:** Labour falls under the Concurrent List, allowing both Centre and States to legislate. Articles 39, 41, 42, 43 and 43A of the Directive Principles promote social and economic justice for workers.
- **Need for Rationalisation:** Earlier, labour laws were fragmented across 29 legislations leading to compliance burdens. The Labour Codes seek to simplify regulations and improve labour administration.

Four Labour Codes

Labour Code	Key Objective
Code on Wages, 2019	Uniform wage framework and national floor wage

Industrial Relations Code, 2020	Regulation of trade unions, strikes and retrenchment
Code on Social Security, 2020	Social security for organised, unorganised and gig workers
OSH Code, 2020	Occupational safety, health and working conditions

Significance of Labour Codes

- **Ease of Doing Business:** Simplified compliance through digitisation and consolidation of laws. This is expected to reduce regulatory complexity and encourage investments.
- **Formalisation of Workforce:** Uniform rules aim to bring more workers into the formal economy. It can improve access to social security and legal protection.
- **Coverage of Gig Workers:** For the first time, gig and platform workers are recognised under social security provisions. This reflects changing employment patterns in the digital economy.

Major Concerns

- **Wage Determination Issues:** Experts have raised concerns over changes in minimum wage criteria. This may affect transparency and widen wage disparities across sectors and states.
- **Weakening of Collective Bargaining:** Provisions relating to strikes and retrenchment are viewed as favouring employers. Trade unions fear erosion of workers' negotiating power.
- **Implementation Challenges:** Labour being a Concurrent List subject may lead to varying standards across states. Differences in rules can create inconsistencies in labour welfare.

Social Security and Informal Sector

- **Dedicated Social Security Fund:** The Code on Social Security provides for schemes for unorganised and gig workers. This marks a shift towards inclusive labour welfare.
- **Coverage Challenges:** A large informal workforce and lack of comprehensive databases may hinder effective implementation. Ensuring portability and accessibility of benefits remains crucial.

Way Forward

- **Strengthen Tripartite Consultation:** Regular dialogue among government, employers and trade unions is

essential. This can ensure balanced reforms and greater consensus.

- **Uniform Minimum Standards:** States should maintain minimum labour protection standards. This will prevent disparities and ensure dignity of labour.
- **Effective Social Security Delivery:** Robust databases and digital platforms should be developed. This will improve coverage of informal and gig workers.

Conclusion

The operationalisation of the Labour Codes marks a major reform in India's labour governance. Their long-term success will depend on balancing economic efficiency with adequate protection of workers' rights and social security.

DPSPs Related to Labour Welfare

- **Article 39** – Adequate means of livelihood and equal pay for equal work.
- **Article 41** – Right to work, education and public assistance.
- **Article 42** – Just and humane conditions of work and maternity relief.
- **Article 43** – Living wage and decent standard of life for workers.
- **Article 43A** – Participation of workers in management of industries.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the Labour Codes in India, consider the following statements:

1. Labour is a subject under the Concurrent List of the Constitution.
2. The Code on Social Security, 2020 recognises gig and platform workers.
3. Article 43A of the Constitution provides for participation of workers in management of industries.

How many of the above statements are incorrect?

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

Answer: (d)

INTERNATIONAL RELATIONS

Strait of Hormuz Crisis and India's Energy Security

Why in News: The continuing instability in West Asia and disruptions in shipping through the Strait of Hormuz have once again highlighted the vulnerability of global energy supply chains.

The crisis has triggered volatility in crude oil markets, raised shipping and insurance costs, and renewed concerns about energy security among major import-dependent economies, including India. While recent diplomatic efforts have raised hopes of normalisation, experts caution that disruptions in oil and gas markets may persist for months.

The Strait of Hormuz: Why Does It Matter?

The Strait of Hormuz is a narrow maritime passage connecting the Persian Gulf with the Gulf of Oman and the Arabian Sea. It is widely regarded as the world's most important energy chokepoint.

Key Facts

- Nearly one-fifth of global oil trade passes through the Strait.
- A significant share of global LNG exports, particularly from Qatar, transit through this route.
- Major oil-producing countries such as Saudi Arabia, Iraq, Kuwait, the UAE, Qatar and Iran depend on it for exports.

Any disruption in this corridor has immediate consequences for global energy markets, freight costs, inflation and economic growth.

Impact on Global Energy Markets

The conflict in West Asia triggered one of the most severe energy supply disruptions in recent decades.

Key Consequences

Rising Crude Oil Prices

- Global benchmark crude prices witnessed sharp spikes due to fears of supply shortages.
- Energy markets experienced heightened volatility as traders assessed the duration of disruptions.

Increase in Shipping Costs

- Marine insurance premiums rose sharply.
- Many vessels were forced to take longer routes around Africa's Cape of Good Hope.
- Delivery schedules were extended by several weeks, increasing transportation costs.

Pressure on Global Gas Markets

- LNG supplies faced disruptions.

- Countries dependent on imported natural gas experienced higher energy costs.

Why Is India Particularly Vulnerable?

India is the world's third-largest consumer of crude oil and imports more than 85% of its petroleum requirements.

India's Dependence on Hormuz

- Approximately half of India's crude oil imports transit through the Strait of Hormuz.
- Around 60% of LNG imports are linked to this route.
- A substantial portion of LPG imports also depends on uninterrupted movement through the Strait.

Thus, any prolonged disruption directly affects India's energy security, import bill and inflation trajectory.

How Has India Responded?

1. Diversification of Energy Sources

Over the last few years, India has reduced excessive dependence on any single region by expanding imports from:

- Russia
- United States
- West Africa
- Latin America
- Atlantic Basin producers

This diversification has enhanced India's resilience against regional disruptions.

2. Strengthening Strategic Petroleum Reserves

India has expanded its strategic petroleum reserves (SPRs) to create buffers against temporary supply disruptions. These reserves provide critical breathing space during periods of geopolitical uncertainty.

3. Ensuring Domestic Energy Availability

The government adopted several emergency measures:

- Prioritisation of LPG supplies for households.
- Protection of gas supplies for fertilizer plants.
- Maintenance of refinery operations at high utilisation levels.
- Diplomatic engagement with energy-producing nations.
- Enhanced naval presence in the Arabian Sea and Gulf region.

These interventions helped avoid panic and ensured continuity of essential supplies.

The Hidden Cost: Pressure on Oil Marketing Companies

India's relative insulation from global energy shocks has come at a financial cost.

State-owned Oil Marketing Companies (OMCs) have absorbed a significant portion of rising international prices to prevent sudden increases in domestic fuel prices.

Consequences

- Rising under-recoveries for OMCs.
- Pressure on company balance sheets.

- Increased fiscal burden on the government.
- Distortion of market signals that encourage efficient energy use.

While such interventions protect consumers in the short term, they become difficult to sustain during prolonged crises.

Structural Challenges Before India

The Hormuz crisis has exposed a deeper reality:

India's Energy Vulnerability is Structural

Several sectors remain heavily dependent on imported fossil fuels:

- **Transportation**
- **Aviation**
- **Logistics**
- **Manufacturing**
- **Agriculture**
- **Fertilizer production**

Consequently, India cannot remain permanently insulated from global energy shocks.

Even a modest increase in crude oil prices significantly raises India's import bill, affects the current account balance and puts pressure on the rupee.

The Emerging Policy Debate

Should India Continue Shielding Consumers?

Policymakers face a difficult choice:

Option 1: Continue Price Protection

Advantages:

- Controls inflation.
- Protects household budgets.
- Supports economic recovery.

Challenges:

- Increases fiscal burden.
- Weakens OMC finances.
- Encourages inefficient consumption.

Option 2: Gradual Price Rationalisation

Advantages:

- Improves financial health of OMCs.
- Reduces subsidy burden.
- Encourages energy conservation.

Challenges:

- May contribute to inflation.
- Can generate political resistance.

The challenge lies in balancing economic stability with fiscal sustainability.

Towards Long-Term Energy Security

The Hormuz crisis reinforces the need for a comprehensive energy security strategy.

Key Priorities

- **Diversification of Import Sources:** Reducing concentration risk through wider sourcing networks.
- **Expansion of Strategic Reserves:** Increasing petroleum stockpiles to withstand longer disruptions.
- **Renewable Energy Transition:** Accelerating investments in:

- Solar energy
- Wind energy
- Green hydrogen
- Battery storage technologies

- **Energy Efficiency:** Promoting:

- Fuel-efficient transport systems
- Electric mobility
- Public transport
- Responsible energy consumption

- **Strengthening Maritime Security:** Protecting sea lanes and ensuring freedom of navigation through strategic partnerships and naval capabilities.

Conclusion

The Strait of Hormuz is no longer merely a geopolitical flashpoint; it has become a test of national resilience. India's success in maintaining stable supplies despite global disruptions demonstrates improved crisis-management capabilities and greater diversification of energy sources. However, the episode also reveals the limits of relying on imported fossil fuels in an increasingly uncertain world.

The future of India's energy security will depend not only on diplomacy and diversification but also on accelerating the transition towards cleaner energy, expanding strategic reserves and promoting responsible consumption. In the emerging global order, energy security is no longer just an economic issue—it is a core pillar of national security.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. The Strait of Hormuz remains one of the most critical maritime chokepoints for global energy trade. Examine its significance for India's energy security and discuss the measures required to reduce India's vulnerability to external energy shocks. (15 Marks, 250 Words)

India–Italy Relations

Why in News: Prime Minister Narendra Modi concluded his official visit to Italy with a significant upgrade in bilateral relations as India and Italy elevated their ties to a **Special Strategic Partnership**. The visit witnessed the signing of several strategic agreements covering defence, critical minerals, agriculture, law enforcement cooperation, and Africa-focused development initiatives.

Key Highlights of the Visit

Elevation of Bilateral Ties

India and Italy decided to upgrade their existing Strategic Partnership to a **Special Strategic Partnership**, reflecting growing convergence in political, economic, technological and security domains.

The partnership is expected to strengthen cooperation in:

- **Trade and investment**
- **Defence and security**
- **Critical technologies**
- **Artificial Intelligence (AI)**

- **Clean energy transition**
- **Innovation and research**
- **Skilled workforce mobility**
- **Maritime cooperation and connectivity**



- Renewable energy technologies
- Defence manufacturing

The agreement seeks to strengthen supply-chain resilience and reduce vulnerabilities arising from excessive dependence on a limited number of suppliers.

Cooperation in Agriculture and Research

The two sides signed an agreement on agriculture and agricultural research.

The agreement aims to promote cooperation in:

- Agricultural innovation
- Climate-resilient farming
- Research collaboration
- Food security
- Sustainable agricultural practices

It will facilitate collaboration between ministries, universities and research institutions of both countries.

Commitment to a Free and Open Indo-Pacific

India and Italy reaffirmed their support for:

- A free, open and inclusive Indo-Pacific.
- Respect for international law.
- Freedom of navigation.
- Peaceful resolution of maritime disputes.

Both countries specifically referred to adherence to the **United Nations Convention on the Law of the Sea (UNCLOS)** as the foundation of maritime governance.

Concern Over the Strait of Hormuz

Against the backdrop of tensions in West Asia, the two countries stressed the importance of:

- Freedom of navigation.
- Uninterrupted maritime commerce.
- Stability of global energy supply chains.

They called for the restoration of normal shipping flows through the **Strait of Hormuz**, one of the world's most critical energy chokepoints.

India-Italy Partnership in Africa

One of the most innovative outcomes of the visit was the decision to cooperate through **trilateral initiatives in Africa**.

Areas of Collaboration

India and Italy will work with African partners in:

- Digital Public Infrastructure (DPI)
- Agriculture
- Healthcare
- Education
- Artificial Intelligence
- Renewable energy
- Connectivity and infrastructure

The initiative combines India's development partnership experience in Africa with Italy's **Mattei Plan**, which seeks to deepen Italy's engagement with the African continent.

Why is it important?

This reflects the growing trend of development partnerships involving multiple stakeholders and highlights Africa's increasing strategic importance in global geopolitics.

The two countries also agreed to establish a Foreign Ministers-led review mechanism to provide strategic guidance to the partnership.

Dialogue and Diplomacy (Shared Approach to Global Conflicts)

A major focus of the discussions was the evolving geopolitical situation in:

- **Ukraine**
- **West Asia**
- **Indo-Pacific region**

Prime Minister Modi reiterated India's long-standing position that conflicts cannot be resolved through military means alone. **"All problems should be resolved through dialogue and diplomacy."** Both countries agreed on the importance of peaceful conflict resolution and maintaining international stability amidst growing geopolitical tensions.

Defence Cooperation Receives a Major Boost

One of the most significant outcomes of the visit was the signing of a **Defence Industrial Road Map**.

Key Objectives

- Co-development of defence technologies.
- Co-production of defence equipment.
- Enhanced industrial collaboration.
- Strengthening supply-chain resilience.
- Expansion of maritime security cooperation.

The agreement aligns with India's broader objective of promoting indigenous defence manufacturing under the Make in India initiative while diversifying defence partnerships.

Critical Minerals Partnership

India and Italy signed an MoU on cooperation in **critical minerals**, a sector that has emerged as a strategic priority globally.

Why are Critical Minerals Important?

Critical minerals such as:

- **Lithium**
- **Cobalt**
- **Nickel**
- **Rare earth elements**

are essential for:

- Electric vehicles (EVs)
- Batteries
- Semiconductors

Economic Significance

The two countries are working towards expanding bilateral trade and investment significantly over the coming years.

Key sectors of cooperation include:

- Manufacturing
- Defence and aerospace
- Clean technologies
- Pharmaceuticals
- Machinery
- Automotive components
- Green energy

The partnership also complements broader India–Europe economic engagement and supports resilient supply-chain development.

Why is Italy Important for India?

Strategic Importance

- Key member of the European Union.
- Important stakeholder in the Mediterranean region.
- Partner in Indo-Pacific cooperation.

Economic Importance

- Strong manufacturing and industrial base.
- Advanced technology ecosystem.
- Significant investment potential.

Geopolitical Importance

- Support for diversified supply chains.
- Cooperation in maritime security.
- Collaboration in Africa and the Indo-Mediterranean region.

FAO Agricola Medal

During the visit, Prime Minister Modi was conferred the **Agricola Medal 2026** by the Food and Agriculture Organization (FAO) at its headquarters in Rome.

Significance

The award recognises contributions towards:

- Agricultural transformation.
- Food security.
- Sustainable farming.
- Rural development.
- Global cooperation in agriculture.

The honour highlights India's growing role in addressing global food and agricultural challenges.

Conclusion

The elevation of India–Italy relations to a **Special Strategic Partnership** marks a significant advancement in bilateral ties. Beyond trade and diplomacy, the partnership is increasingly driven by strategic sectors such as defence, critical minerals, clean energy, technology and Africa-focused development cooperation. As geopolitical uncertainties reshape global politics, India and Italy are positioning themselves as important partners in promoting economic resilience, maritime security, sustainable development and a rules-based international order.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. The elevation of India–Italy relations to a Special Strategic Partnership reflects the changing contours of India's engagement with Europe. Examine its significance in the context of defence cooperation, critical minerals, maritime security and Africa outreach. (15 Marks, 250 Words)

India–Norway Relations

Why in News: Prime Minister Narendra Modi's visit to Norway marked a significant milestone in bilateral relations as India and Norway elevated their ties to a **Green Strategic Partnership**. The visit also highlighted growing cooperation in areas such as the Arctic, green shipping, renewable energy, blue economy, space technology, and maritime security.

Key Highlights of the Visit

1. India–Norway Green Strategic Partnership

The two countries agreed to upgrade bilateral relations to a **Green Strategic Partnership**, reflecting a shared commitment to sustainable growth and climate-resilient development.

Prime Minister Modi highlighted that the partnership would combine:

- India's scale, market size, talent pool and manufacturing capabilities.
- Norway's strengths in technology, innovation, clean energy and capital investment.

The partnership aims to deepen collaboration across emerging sectors including:

- Renewable energy
- Green hydrogen
- Green shipping
- Blue economy
- Arctic research
- Space technology
- Sustainable infrastructure development

This marks a transition from a traditional economic relationship to a future-oriented strategic partnership centred on sustainability and technological cooperation.

Shared Commitment to a Rules-Based Order

A major theme of the discussions was the importance of preserving a rules-based international order amid growing geopolitical uncertainty.

Both leaders emphasised:

- Respect for international law.
- Dialogue and diplomacy as preferred tools of conflict resolution.
- Peaceful settlement of disputes.
- Opposition to unilateral coercive measures.

Prime Minister Modi reiterated that neither the conflict in Ukraine nor the crisis in West Asia can be resolved through

military means and called for sustained diplomatic efforts towards peace.

Norway's Remarks on "Weaponisation"

Prime Minister Jonas Gahr Støre made a notable observation regarding contemporary geopolitics, stating that countries committed to democratic values must work together against those who:

- Weaponise diplomacy.
- Weaponise trade.
- Weaponise technology.

Though no country was explicitly named, the remarks were widely interpreted as reflecting concerns regarding:

- Economic coercion.
- Protectionist trade policies.
- Technological restrictions and supply-chain disruptions.
- Strategic use of economic interdependence as a geopolitical tool.

The statement highlights an emerging global debate on economic security and the increasing overlap between trade, technology and geopolitics.

Economic Dimension: EFTA Trade Agreement

The leaders reviewed progress under the **Trade and Economic Partnership Agreement (TEPA)** signed between India and the four-member European Free Trade Association (EFTA):

- Norway
- Switzerland
- Iceland
- Liechtenstein

The agreement is expected to:

- **Attract nearly \$100 billion in investments.**
- **Create approximately one million jobs in India.**
- **Strengthen technology transfers.**
- **Enhance cooperation in innovation and advanced manufacturing.**

For India, TEPA complements ongoing negotiations for a broader India–European Union Free Trade Agreement and supports its objective of becoming a global manufacturing and investment hub.

Areas of Emerging Cooperation

Arctic Cooperation

Norway's expertise in Arctic governance and polar research offers opportunities for India to strengthen its scientific presence in the Arctic region.

Potential areas include:

- Climate research
- Polar studies
- Sustainable resource management
- Maritime navigation

Blue Economy

The two countries are expanding cooperation in:

- Sustainable fisheries

- Marine resource management
- Ocean technology
- Maritime infrastructure

Green Shipping

Norway is a global leader in maritime decarbonisation, making it an important partner for India's efforts to develop low-carbon shipping corridors and green ports.

Space Cooperation

The partnership also covers collaboration in:

- Satellite technology
- Space applications
- Scientific research
- Emerging technologies

Strategic Significance for India

Energy Transition

Norway's expertise in renewable energy and clean technologies can support India's net-zero ambitions and energy transition goals.

Technology and Innovation

The partnership provides access to advanced technologies in:

- Clean energy
- Maritime systems
- Artificial intelligence
- Digital infrastructure

Diversification of Partnerships

The agreement strengthens India's engagement with smaller but technologically advanced European economies, reducing excessive dependence on any single geopolitical bloc.

Support for Strategic Autonomy

India continues to engage constructively with multiple partners while maintaining an independent foreign policy approach on global conflicts and geopolitical issues.

Challenges and Differences

Despite growing convergence, certain differences remain.

Historically, Norway has:

- Encouraged stronger international criticism of Russia's actions in Ukraine.
- Expressed concerns regarding India's increasing imports of Russian crude oil.

India, on the other hand, has maintained its position of strategic autonomy, balancing national interests with global responsibilities.

The visit demonstrated that both countries are willing to manage differences while expanding cooperation in areas of mutual benefit.

India–Nordic Summit 2026

Prime Minister Narendra Modi participated in the **Third India–Nordic Summit** held in Oslo, Norway, alongside the leaders of Denmark, Finland, Iceland, Norway, and Sweden.

Key Highlights of the Summit

Elevation of Ties

India and the five Nordic countries agreed to upgrade their partnership into a **Green Technology and Innovation Strategic Partnership**, signalling a shift from sector-specific cooperation to a comprehensive strategic framework focused on future technologies and sustainable development.

Areas of Cooperation

1. Green Technology and Clean Energy

The partnership aims to deepen collaboration in:

- Renewable energy
- Green hydrogen
- Sustainable manufacturing
- Climate-resilient infrastructure
- Circular economy practices
- Carbon-neutral technologies

Nordic countries are global leaders in green innovation, while India offers scale, manufacturing capacity, skilled human resources, and a large market. Together, these complementarities can accelerate the green transition.

2. Digital Innovation and Emerging Technologies

The summit highlighted cooperation in:

- Artificial Intelligence (AI)
- 5G and 6G technologies
- Quantum technologies
- Digital public infrastructure
- Cybersecurity
- Innovation ecosystems

The Nordic countries are among the most digitally advanced economies in the world, making them valuable partners for India's digital transformation agenda.

3. Maritime and Blue Economy Cooperation

Both sides agreed to strengthen cooperation in:

- Sustainable shipping
- Port modernisation
- Ocean governance
- Marine resource management
- Blue economy initiatives

This aligns with India's broader maritime vision under the Indo-Pacific framework and SAGAR (Security and Growth for All in the Region).

4. Arctic Research and Polar Cooperation

The summit underscored the growing importance of Arctic engagement.

Areas of collaboration include:

- Climate science
- Polar research
- Environmental monitoring
- Sustainable Arctic governance
- Emerging Arctic shipping routes

As climate change transforms the Arctic, cooperation with Nordic countries can strengthen India's scientific and strategic understanding of the region.

Economic Significance

The leaders welcomed growing trade and investment linkages between India and the Nordic region.

The partnership is expected to complement:

- The India-EFTA Trade and Economic Partnership Agreement (TEPA)
- Progress in India-EU economic engagement
- Supply-chain diversification efforts
- Investments in sustainable industries

The Nordic countries possess significant expertise in advanced manufacturing, clean technologies, innovation financing, and research-led growth models.

Bilateral Engagements on the Sidelines

Prime Minister Modi held separate meetings with the leaders of:

- Norway
- Denmark
- Finland
- Sweden
- Iceland

Notably, his meeting with Icelandic Prime Minister Kristrún Mjöll Frostadóttir was the first since her election in 2024. The interaction symbolised the expanding political engagement between India and Iceland, with both leaders expressing optimism about future cooperation.

In a memorable cultural moment, Prime Minister Frostadóttir highlighted the linguistic similarity of the word "**sambandh**" (**relationship**) in Hindi and Icelandic, underscoring the civilisational connections that often transcend geography.

Conclusion

The elevation of India–Norway relations to a Green Strategic Partnership marks a significant step in India's engagement with Europe. Beyond trade and investment, the partnership reflects a shared vision of sustainable development, technological innovation and rules-based global governance. As geopolitical competition intensifies and climate challenges become more urgent, collaborations such as these are likely to become central pillars of India's foreign policy and economic strategy.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. The India–Norway Green Strategic Partnership reflects the growing importance of sustainability and technology in contemporary diplomacy. Examine its significance for India's economic, strategic and environmental objectives. (15 Marks, 250 Words)

India–Vietnam Relations

Why in News: India and Vietnam have elevated their bilateral ties to an **“Enhanced Comprehensive Strategic Partnership”** during the visit of Vietnamese leader To Lam to India.

Key Details

The two countries signed **13 agreements** covering:

- **critical minerals,**
- **rare earths,**
- **digital payments,**
- **defence cooperation,**
- **maritime security,**
- **and technology partnerships.**

Prime Minister Narendra Modi described Vietnam as “a major pillar of India’s Act East Policy and Vision MAHASAGAR.”

The visit comes at a time of rising geopolitical tensions in the Indo-Pacific, increasing competition with China, supply-chain realignments, and intensifying maritime security concerns in the South China Sea.

Why India–Vietnam Relations Matter?

At first glance, India and Vietnam may appear geographically distant partners. But strategically, they are becoming increasingly important to each other.

Both countries:

- share concerns regarding regional stability,
- support a rules-based international order,
- oppose unilateral coercion,
- and seek a multipolar Indo-Pacific.

The India–Vietnam partnership today represents something much larger i.e. the emergence of middle-power coalitions in Asia.

These are partnerships not based on military alliances, but on strategic convergence, economic resilience, maritime cooperation, and balancing behaviour.

Why Vietnam is important for India?

1. Vietnam is Central to India’s “Act East Policy”

India’s Act East Policy aims to deepen engagement with ASEAN, East Asia, Indo-Pacific economies, and maritime Southeast Asia.

Among ASEAN nations, Vietnam is one of India’s closest strategic partners. Vietnam occupies a highly strategic location:

- facing the South China Sea,
- near critical shipping lanes,
- and at the heart of Indo-Pacific geopolitics.

Vietnam therefore acts as India’s strategic gateway into maritime Southeast Asia.

2. Shared Concerns Regarding China

Although Indian officials clarified that the partnership is “not aimed at any country,” the geopolitical context is impossible to ignore.

Both India and Vietnam have experienced:

- border tensions,
- strategic pressure,
- and maritime disputes involving China.

Vietnam has territorial disputes with China in the South China Sea. India faces boundary tensions along the Himalayas and strategic competition in the Indian Ocean.

Thus, India and Vietnam increasingly cooperate on maritime security, naval coordination, defence capacity-building, and freedom of navigation.

The partnership reflects a broader Indo-Pacific trend i.e. countries are building flexible strategic coalitions without forming formal military alliances.

3. Maritime Security and the Indo-Pacific

The Indo-Pacific has emerged as the world’s most important geopolitical theatre. It contains major shipping routes, energy corridors, semiconductor supply chains, and critical maritime chokepoints.

India and Vietnam both support:

- **freedom of navigation,**
- **UNCLOS-based maritime order,**
- **peaceful dispute resolution,**
- **and open sea lanes.**

The joint statements repeatedly emphasized:

- rule of law,
- peace,
- stability,
- and prosperity in the Indo-Pacific.

The Defence Dimension

Defence cooperation is now one of the strongest pillars of India-Vietnam relations.

Lines of Credit (LoC) for Defence

India has extended defence Lines of Credit to Vietnam for defence procurement, naval capabilities, and military modernization.

Areas of Defence Cooperation

The two countries are cooperating in:

- naval training,
- maritime domain awareness,
- ship maintenance,
- defence industry collaboration,
- cybersecurity,
- and joint military interactions.

Discussions are also progressing regarding defence manufacturing, technology transfer, and strategic dialogues.

Brahmos and Strategic signaling

Although not officially confirmed in this visit, discussions around possible BrahMos missile exports to Vietnam continue to attract strategic attention.

BrahMos Aerospace

If realized fully, such cooperation would significantly alter:

- deterrence dynamics,
- maritime security equations,
- and strategic calculations in the South China Sea.

This demonstrates how India is gradually emerging as a defence exporter rather than merely a defence importer.

Critical Minerals:

The New Geopolitics

One of the most important agreements signed relates to rare earths, radioactive minerals, and critical minerals cooperation. This is strategically extremely significant.

Why critical minerals matter?

- The future global economy depends heavily on lithium, cobalt, nickel, graphite, and rare earth elements.
- These are essential for batteries, electric vehicles, semiconductors, renewable energy, defence electronics, and AI hardware.
- Today, China dominates much of the global processing ecosystem for rare earths. Thus, countries across the world are attempting to diversify mineral partnerships, secure supply chains, and reduce strategic dependence.
- Vietnam possesses substantial rare-earth reserves. India possesses refining ambitions, manufacturing demand, and technological aspirations. The partnership therefore reflects the emerging geopolitics of clean-energy supply chains.

Digital Payments

Another important agreement involved cooperation between the Reserve Bank of India, and the State Bank of Vietnam on payment systems, fintech innovation, and digital payments.

This reflects India's growing effort to internationalize:

- **UPI,**
- **digital governance models,**
- **and Digital Public Infrastructure (DPI).**

India increasingly views technology not merely as economics, but as an instrument of strategic influence.

Countries adopting Indian digital systems deepen:

- interoperability,
- financial connectivity,
- and long-term institutional partnerships.

Historical Foundations of the Relationship

The relationship between India and Vietnam has deep historical roots. Vietnamese leader To Lam recalled that Jawaharlal Nehru was the first foreign leader to visit Vietnam after the liberation of Hanoi in 1954.

India supported:

- Vietnam's anti-colonial struggle,
- peaceful reconstruction,
- and international recognition.

This historical goodwill still shapes contemporary relations.

Unlike many great-power relationships rooted in coercion or rivalry, India-Vietnam ties possess civilizational warmth, anti-colonial solidarity, and political trust.

Asean and India

Vietnam is one of the most influential members of Association of Southeast Asian Nations

India views ASEAN as central to Indo-Pacific stability, regional connectivity, and economic integration.

Strengthening ties with Vietnam therefore helps India:

- deepen ASEAN engagement,
- balance Chinese influence,
- and enhance maritime presence in Southeast Asia.

Economic Relations

India and Vietnam aim to increase bilateral trade from nearly \$16 billion currently to \$25 billion by 2030. But the relationship is no longer limited to traditional trade.

The focus is shifting toward:

- resilient supply chains,
- manufacturing integration,
- semiconductors,
- pharmaceuticals,
- logistics,
- and clean energy.

This aligns with broader global trends where countries seek "China-plus-one" diversification strategies. Vietnam has emerged as one of Asia's major manufacturing hubs. India seeks to become another. Thus, economic cooperation between them carries strategic significance.

India's Indo-Pacific Strategy

India's Vietnam engagement reflects its broader Indo-Pacific doctrine i.e. strategic autonomy with strategic partnerships.

India is simultaneously:

- part of the Quad,
- active in BRICS,
- engaging ASEAN,
- strengthening Europe ties,
- and deepening Gulf relations.

Rather than forming alliances, India prefers: issue-based partnerships, flexible coalitions, and strategic balancing. Vietnam fits perfectly into this framework.

Challenges in the Relationship

Despite growing convergence, challenges remain.

1. Trade Imbalance and Connectivity Gaps

Economic ties still remain below potential.

2. China Sensitivity

Both countries must carefully manage ties without provoking direct confrontation.

3. Limited Institutional Integration

People-to-people exchanges, academic ties, and investment levels still require expansion.

Additional recent developments

Several important developments further strengthen the relationship:

- Discussions are underway on establishing a "2+2 Dialogue" involving foreign and defence officials.
- Cooperation in maritime domain awareness and cyber-security has expanded.
- Both sides emphasized implementation of the 2024–2028 Action Plan.
- Collaboration in energy exploration under UNCLOS frameworks was reaffirmed.

Conclusion

The elevation of India-Vietnam ties is not merely another diplomatic upgrade. It reflects the emergence of a new Asian strategic architecture, middle-power cooperation, and resilient Indo-Pacific partnerships.

In a world increasingly shaped by geopolitical rivalry, technological competition, maritime insecurity, and supply-chain fragmentation, India and Vietnam are discovering that their interests increasingly converge.

The partnership today rests on five powerful pillars:

- strategic trust,
- maritime cooperation,
- defence collaboration,
- economic resilience,
- and technological partnership.

Most importantly, it demonstrates a defining feature of contemporary geopolitics that Nations no longer build partnerships only through ideology. They build them through shared vulnerabilities, shared geography, and shared strategic interests. For India, Vietnam is no longer just an ASEAN partner. It is becoming one of the central pillars of India's Indo-Pacific strategy.

India-Nepal Border Row Resurfaces

Why in News: Just ahead of Indian Foreign Secretary Vikram Misri's proposed visit to Kathmandu, Nepal formally objected to the upcoming Kailash Manasarovar Yatra route through the Lipulekh Pass, reiterating that the Kalapani-Limpiadhura-Lipulekh region forms an integral part of Nepal's sovereign territory.

- India rejected Nepal's claims, stating that they are "not based on historical facts and evidence," while maintaining that the Lipulekh route has been used for the pilgrimage since 1954.
- The controversy has revived one of the most sensitive fault lines in India-Nepal relations — the unresolved western boundary dispute rooted in colonial-era cartography and competing interpretations of the 1816 Treaty of Sugauli.

A DISPUTE OLDER THAN MODERN INDIA

The India-Nepal border dispute is not a recent geopolitical confrontation. Its roots lie in the aftermath of the Anglo-Nepalese War (1814–1816), which ended with the Treaty of Sugauli between the East India Company and the Kingdom of Nepal.

The treaty stated that Nepal would retain territory east of the Kali (Mahakali) River.

However, the treaty never clearly defined:

- the precise origin of the Kali River,
- nor did it attach an authoritative map.

This seemingly technical ambiguity became the foundation of a major geopolitical dispute two centuries later.

The disagreement today revolves around:

- **Kalapani,**
- **Lipulekh,**
- **and Limpiadhura,**

located at the trijunction of:

- India,

- Nepal,
- and China (Tibet Autonomous Region).

The Core of the Dispute:

Where does the Kali river originate?

This is the central legal and cartographic question.

Nepal's Position

Nepal argues that:

- the Kali River originates at Limpiadhura,
- therefore, all territory east of it belongs to Nepal.

Under this interpretation:

- Kalapani,
- Lipulekh,
- and surrounding areas fall within Nepalese territory.

Kathmandu cites:

- historical maps,
- colonial-era records,
- and the Treaty of Sugauli to support its claim.

India's Position

India argues that:

- the river originates near Lipulekh,
- not Limpiadhura.

India also cites:

- administrative records from the 19th century,
- revenue documents,
- and long-standing control and governance of the area from present-day Uttarakhand.

New Delhi maintains that the Lipulekh Pass has historically functioned as:

- a trade route,
- a pilgrimage corridor,
- and a strategically administered Indian frontier zone.

Why is lipulekh so strategic?

The Lipulekh Pass is not merely a symbolic territorial issue.

It possesses enormous:

- strategic,
- economic,
- religious,
- and geopolitical significance.

1. Gateway to Kailash Manasarovar Yatra

Lipulekh serves as one of the most important routes for Indian pilgrims travelling to:

- Mount Kailash,
- and Lake Manasarovar in Tibet.

For Hindus, Buddhists, Jains, and Bon followers, Kailash is among the holiest spiritual destinations in Asia.

The reopening of the route after disruptions due to the pandemic and India-China tensions has therefore acquired major symbolic importance.

2. Strategic Himalayan Corridor

The region lies near the India-China frontier and carries immense military importance.

India stationed troops in Kalapani after the 1962 India-China War to monitor strategic Himalayan approaches.

The area offers:

- surveillance advantages,
- access routes,
- and strategic depth near Tibet.

Thus, for India, the issue is deeply linked to:

- national security,
- border defence,
- and Himalayan military strategy.

3. India-China-Nepal Geopolitical Triangle

The dispute increasingly intersects with broader regional competition involving:

- India,
- China,
- and Nepal.

Note: China's growing infrastructure and political presence in Nepal has added new geopolitical sensitivity to the issue. Interestingly, Nepal recently conveyed its concerns not only to India, but also to China regarding the pilgrimage route through Lipulekh. This indicates that Kathmandu seeks recognition of its territorial claims from both neighbouring powers.

Recent developments that reignited the issue

1. Resumption of Kailash Yatra

India announced that the Kailash Manasarovar Yatra through Lipulekh would resume during June–August 2026 in coordination with China.

Nepal strongly objected, calling the route “Nepalese territory.”

2. Prime Minister Balendra Shah's Remarks

Nepal's new Prime Minister Balendra “Balen” Shah made controversial remarks in Parliament stating:

“Not only has India encroached Nepali territory, but Nepal has also encroached Indian territory.”

This unusual statement triggered:

- protests within Nepal,
- political backlash,
- and diplomatic attention in India.

His remarks reflected a shift from pure nationalist rhetoric toward acknowledgment of complex historical realities surrounding the border.

3. Call for UK Involvement

- Another major development emerged when Nepal hinted at involving:
 - the United Kingdom,
 - and China,
- because the dispute originates from British colonial treaties.

- India firmly rejected any third-party mediation, reiterating that all disputes must be resolved bilaterally.
- This is consistent with India's long-standing diplomatic principle:
 - No external mediation in bilateral territorial disputes.

The 2020 Turning Point:

Why the issue became more sensitive?

Although the dispute is old, tensions escalated sharply in 2020.

India's Road Construction

India inaugurated the:

- Dharchula–Lipulekh road,

to facilitate:

- pilgrim movement,
- military logistics,
- and border connectivity.

Nepal protested that the road passed through its territory.

Nepal's New Political Map

In response, Nepal's Parliament approved a new official political map incorporating:

- Kalapani,
- Lipulekh,
- and Limpiyadhura.

This transformed the issue from a diplomatic disagreement into a constitutional-nationalist question inside Nepal.

Since then, the issue has become deeply embedded in Nepali domestic politics.

Why this issue matters for India

1. Security of the Himalayan Frontier

India's Himalayan borders are increasingly sensitive due to:

- China's military assertiveness,
- border infrastructure competition,
- and strategic vulnerabilities.

Therefore, territorial questions in tri-junction areas carry significance beyond bilateral diplomacy.

2. Importance of Nepal in India's Neighbourhood Policy

Nepal occupies a special place in India's foreign policy because of:

- open borders,
- deep civilizational ties,
- economic interdependence,
- labour mobility,
- and military cooperation.

The India-Nepal relationship is unique because citizens of both countries enjoy:

- free movement,
- employment rights,
- and deep cultural integration.

Thus, prolonged tensions can affect:

- people-to-people relations,
- trade,

- security cooperation,
- and regional stability.

3. China Factor

Any deterioration in India-Nepal relations creates strategic space for China.

Beijing has steadily expanded influence in Nepal through:

- infrastructure investments,
- connectivity projects,
- political engagement,
- and strategic diplomacy.

India therefore seeks to prevent territorial disputes from evolving into broader geopolitical estrangement.

Diplomatic Complexities in the Current Moment

Foreign Secretary Vikram Misri's expected Kathmandu visit itself came under uncertainty due to:

- evolving political protocols under Prime Minister Balendra Shah,
- and disagreements regarding diplomatic engagement.

This reveals a deeper transformation occurring inside Nepal's political landscape.

Nepal today is witnessing:

- assertive nationalism,
- youth-led political mobilisation,
- anti-establishment politics,
- and demands for greater strategic autonomy.

The new leadership in Kathmandu appears determined to project Nepal as:

an independent Himalayan state balancing both India and China rather than remaining within India's traditional strategic orbit.

Conclusion

The latest controversy over the Kailash Manasarovar Yatra route has once again exposed the fragility and complexity of India-Nepal relations. Yet the relationship cannot be understood solely through the lens of territorial disputes.

India and Nepal remain bound by geography, civilization, religion, economy, migration, and shared Himalayan ecology. The real challenge before both nations is not whether disagreements exist, but whether they can prevent these disagreements from overwhelming one of South Asia's most unique bilateral relationships.

In an increasingly polarized geopolitical environment, mature diplomacy — not emotional nationalism — will determine the future of Himalayan stability.

India–Norway Relations

Why in News: Prime Minister Narendra Modi's visit to Norway marked a significant milestone in bilateral relations as India and Norway elevated their ties to a **Green Strategic Partnership**. The visit also highlighted growing cooperation in areas such as the Arctic, green shipping, renewable

energy, blue economy, space technology, and maritime security.

Key Highlights of the Visit

1. India–Norway Green Strategic Partnership

The two countries agreed to upgrade bilateral relations to a **Green Strategic Partnership**, reflecting a shared commitment to sustainable growth and climate-resilient development.

Prime Minister Modi highlighted that the partnership would combine:

- India's scale, market size, talent pool and manufacturing capabilities.
- Norway's strengths in technology, innovation, clean energy and capital investment.

The partnership aims to deepen collaboration across emerging sectors including:

- Renewable energy
- Green hydrogen
- Green shipping
- Blue economy
- Arctic research
- Space technology
- Sustainable infrastructure development

This marks a transition from a traditional economic relationship to a future-oriented strategic partnership centred on sustainability and technological cooperation.

Shared Commitment to a Rules-Based Order

A major theme of the discussions was the importance of preserving a rules-based international order amid growing geopolitical uncertainty.

Both leaders emphasised:

- Respect for international law.
- Dialogue and diplomacy as preferred tools of conflict resolution.
- Peaceful settlement of disputes.
- Opposition to unilateral coercive measures.

Prime Minister Modi reiterated that neither the conflict in Ukraine nor the crisis in West Asia can be resolved through military means and called for sustained diplomatic efforts towards peace.

Norway's Remarks on "Weaponisation"

Prime Minister Jonas Gahr Støre made a notable observation regarding contemporary geopolitics, stating that countries committed to democratic values must work together against those who:

- Weaponise diplomacy.
- Weaponise trade.
- Weaponise technology.

Though no country was explicitly named, the remarks were widely interpreted as reflecting concerns regarding:

- Economic coercion.
- Protectionist trade policies.
- Technological restrictions and supply-chain disruptions.

- Strategic use of economic interdependence as a geopolitical tool.

The statement highlights an emerging global debate on economic security and the increasing overlap between trade, technology and geopolitics.

Economic Dimension: EFTA Trade Agreement

The leaders reviewed progress under the **Trade and Economic Partnership Agreement (TEPA)** signed between India and the four-member European Free Trade Association (EFTA):

- Norway
- Switzerland
- Iceland
- Liechtenstein

The agreement is expected to:

- **Attract nearly \$100 billion in investments.**
- **Create approximately one million jobs in India.**
- **Strengthen technology transfers.**
- **Enhance cooperation in innovation and advanced manufacturing.**

For India, TEPA complements ongoing negotiations for a broader India–European Union Free Trade Agreement and supports its objective of becoming a global manufacturing and investment hub.

Areas of Emerging Cooperation

Arctic Cooperation

Norway's expertise in Arctic governance and polar research offers opportunities for India to strengthen its scientific presence in the Arctic region.

Potential areas include:

- Climate research
- Polar studies
- Sustainable resource management
- Maritime navigation

Blue Economy

The two countries are expanding cooperation in:

- Sustainable fisheries
- Marine resource management
- Ocean technology
- Maritime infrastructure

Green Shipping

Norway is a global leader in maritime decarbonisation, making it an important partner for India's efforts to develop low-carbon shipping corridors and green ports.

Space Cooperation

The partnership also covers collaboration in:

- Satellite technology
- Space applications
- Scientific research
- Emerging technologies

Strategic Significance for India

Energy Transition

Norway's expertise in renewable energy and clean technologies can support India's net-zero ambitions and energy transition goals.

Technology and Innovation

The partnership provides access to advanced technologies in:

- Clean energy
- Maritime systems
- Artificial intelligence
- Digital infrastructure

Diversification of Partnerships

The agreement strengthens India's engagement with smaller but technologically advanced European economies, reducing excessive dependence on any single geopolitical bloc.

Support for Strategic Autonomy

India continues to engage constructively with multiple partners while maintaining an independent foreign policy approach on global conflicts and geopolitical issues.

Challenges and Differences

Despite growing convergence, certain differences remain.

Historically, Norway has:

- Encouraged stronger international criticism of Russia's actions in Ukraine.
- Expressed concerns regarding India's increasing imports of Russian crude oil.

India, on the other hand, has maintained its position of strategic autonomy, balancing national interests with global responsibilities.

The visit demonstrated that both countries are willing to manage differences while expanding cooperation in areas of mutual benefit.

India–Nordic Summit 2026

Prime Minister Narendra Modi participated in the **Third India–Nordic Summit** held in Oslo, Norway, alongside the leaders of Denmark, Finland, Iceland, Norway, and Sweden.

Key Highlights of the Summit

Elevation of Ties

India and the five Nordic countries agreed to upgrade their partnership into a **Green Technology and Innovation Strategic Partnership**, signalling a shift from sector-specific cooperation to a comprehensive strategic framework focused on future technologies and sustainable development.

Areas of Cooperation

1. Green Technology and Clean Energy

The partnership aims to deepen collaboration in:

- Renewable energy
- Green hydrogen
- Sustainable manufacturing
- Climate-resilient infrastructure
- Circular economy practices
- Carbon-neutral technologies

Nordic countries are global leaders in green innovation, while India offers scale, manufacturing capacity, skilled human resources, and a large market. Together, these complementarities can accelerate the green transition.

2. Digital Innovation and Emerging Technologies

The summit highlighted cooperation in:

- Artificial Intelligence (AI)
- 5G and 6G technologies
- Quantum technologies
- Digital public infrastructure
- Cybersecurity
- Innovation ecosystems

The Nordic countries are among the most digitally advanced economies in the world, making them valuable partners for India's digital transformation agenda.

3. Maritime and Blue Economy Cooperation

Both sides agreed to strengthen cooperation in:

- Sustainable shipping
- Port modernisation
- Ocean governance
- Marine resource management
- Blue economy initiatives

This aligns with India's broader maritime vision under the Indo-Pacific framework and SAGAR (Security and Growth for All in the Region).

4. Arctic Research and Polar Cooperation

The summit underscored the growing importance of Arctic engagement.

Areas of collaboration include:

- Climate science
- Polar research
- Environmental monitoring
- Sustainable Arctic governance
- Emerging Arctic shipping routes

As climate change transforms the Arctic, cooperation with Nordic countries can strengthen India's scientific and strategic understanding of the region.

Economic Significance

The leaders welcomed growing trade and investment linkages between India and the Nordic region.

The partnership is expected to complement:

- The India-EFTA Trade and Economic Partnership Agreement (TEPA)
- Progress in India-EU economic engagement
- Supply-chain diversification efforts
- Investments in sustainable industries

The Nordic countries possess significant expertise in advanced manufacturing, clean technologies, innovation financing, and research-led growth models.

Bilateral Engagements on the Sidelines

Prime Minister Modi held separate meetings with the leaders of:

- Norway
- Denmark
- Finland
- Sweden
- Iceland

Notably, his meeting with Icelandic Prime Minister Kristrún Mjöll Frostadóttir was the first since her election in 2024. The interaction symbolised the expanding political engagement between India and Iceland, with both leaders expressing optimism about future cooperation.

In a memorable cultural moment, Prime Minister Frostadóttir highlighted the linguistic similarity of the word "**sambandh**" (**relationship**) in Hindi and Icelandic, underscoring the civilisational connections that often transcend geography.

Conclusion

The elevation of India–Norway relations to a Green Strategic Partnership marks a significant step in India's engagement with Europe. Beyond trade and investment, the partnership reflects a shared vision of sustainable development, technological innovation and rules-based global governance. As geopolitical competition intensifies and climate challenges become more urgent, collaborations such as these are likely to become central pillars of India's foreign policy and economic strategy.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

The India–Norway Green Strategic Partnership reflects the growing importance of sustainability and technology in contemporary diplomacy. Examine its significance for India's economic, strategic and environmental objectives. (15 Marks, 250 Words)

India–South Korea Defence Ties

Why in News: India and South Korea have launched a new defence innovation platform called Korea–India Defence Accelerator (KIND-X).

Key Details

- The initiative was announced during the summit between Prime Minister Narendra Modi and South Korean President Lee Jae Myung.
- KIND-X seeks to connect **defence start-ups, universities, incubators, investors, research institutions, and defence industries from both countries into a common innovation ecosystem.**
- The development marks a major shift in India–South Korea relations from a traditional buyer-seller defence partnership toward co-development, co-production, and joint defence innovation.
- The initiative comes amid intensifying Indo-Pacific competition, rapid military technological transformation, global semiconductor and critical mineral rivalries, and India's push for defence indigenisation under "Atmanirbhar Bharat".
- At first glance, KIND-X appears to be merely another bilateral defence arrangement. In reality, it reflects a much deeper transformation in global geopolitics. The nature of military power itself is changing.

In the 20th century:

- **military strength depended primarily on troop size,**
- **industrial manufacturing,**
- **tanks,**
- **aircraft,**
- **and missiles.**

In the 21st century:
power increasingly depends on:

- **artificial intelligence,**
- **semiconductors,**
- **autonomous systems,**
- **cyber warfare,**
- **satellite networks,**
- **robotics,**
- **quantum technologies,**
- **and defence innovation ecosystems.**

Thus, countries are no longer competing only through armies. They are competing through innovation ecosystems. KIND-X is India and South Korea's attempt to jointly build such an ecosystem.

Evolution of India–South Korea Defence Relations

India and South Korea established diplomatic relations in 1973. However, defence ties accelerated significantly after the 2000s.

KEY MILESTONES

1. 2005 MoU on Defence Industry and Logistics

This was the first major defence agreement between the two countries.

It promoted cooperation in:

- defence production,
- logistics,
- research and development,
- and procurement.

2. 2010 Defence Cooperation Agreements

Two major agreements were signed:

- Defence Cooperation MoU
- Defence R&D MoU

These enabled:

- military exchanges,
- training,
- joint exercises,
- and technological collaboration.

Importantly, they linked India's DRDO with South Korean defence industries in areas such as marine systems, electronics, and intelligent defence technologies.

3. 2015: Special Strategic Partnership

The relationship was elevated to:

“Special Strategic Partnership”

This indicated growing strategic convergence in:

- Indo-Pacific affairs,
- maritime security,
- defence manufacturing,
- and regional stability.

4. 2020 Roadmap for Defence Industries Cooperation

This roadmap significantly expanded cooperation into:

- land systems,
- naval systems,
- aerospace,
- guided weapon systems,
- technology transfer,
- and industrial investments.

This laid the foundation for today's innovation-driven partnership.

THE K9 VAJRA STORY:

THE SYMBOL OF INDIA–KOREA DEFENCE COOPERATION

The most visible success of bilateral defence cooperation is K9 Vajra-T self-propelled artillery system

It is jointly produced by Larsen & Toubro (India) and Hanwha Aerospace (South Korea) under the “Make in India” initiative.

The project demonstrated several things:

- **successful technology transfer,**
- **domestic manufacturing capability,**
- **private-sector defence participation,**
- **and India's growing defence industrial base.**

WHAT CAN KIND-X UNLOCK?

KIND-X has the potential to fundamentally transform bilateral defence cooperation.

1. DEFENCE STARTUP ECOSYSTEMS

For the first time, start-ups and innovation ecosystems may become central actors in bilateral defence relations. This is significant because future warfare technologies increasingly emerge from private innovation ecosystems, not traditional state-owned military factories.

2. CO-DEVELOPMENT OF FUTURE TECHNOLOGIES

Potential areas include:

- Artificial Intelligence (AI),
- autonomous systems,
- military robotics,
- cyber defence,
- space technologies,
- satellite-based ISR,
- semiconductors,
- counter-drone systems,
- and electronic warfare.

3. DEFENCE SEMICONDUCTORS

Modern warfare increasingly depends on chips. Missiles, satellites, radars, AI systems, communication networks, and drones all require advanced semiconductors. South Korea is among the world's semiconductor leaders. India seeks to develop domestic semiconductor manufacturing. Thus, KIND-X may support strategic technological self-reliance.

4. SPACE SECURITY COOPERATION

The partnership is also expanding into:

- space cooperation,
- surveillance systems,
- satellite communication,

- and Space Situational Awareness (SSA).

This reflects a broader trend that space is becoming militarized and strategically central.

5. CRITICAL MINERALS AND SUPPLY CHAINS

Future defence systems require:

- lithium,
- cobalt,
- rare earths,
- and advanced materials.

Both countries are concerned about supply-chain vulnerabilities and overdependence on concentrated global suppliers.

Thus, KIND-X intersects with:

- geoeconomics,
- industrial policy,
- and strategic autonomy.

THE “DEFENCE INNOVATION ECOSYSTEM” MODEL

Traditionally, defence cooperation meant:

- government-to-government arms sales.

KIND-X represents a radically different philosophy.

Now, defence innovation involves:

- universities,
- venture capital,
- start-ups,
- AI labs,
- semiconductor fabs,
- and deep-tech entrepreneurs.

This is because innovation speed increasingly determines military advantage. Countries unable to innovate rapidly risk strategic irrelevance.

INDIA’S LARGER STRATEGY:

ATMANIRBHAR BHARAT IN DEFENCE

KIND-X aligns strongly with Atmanirbhar Bharat. India seeks to transform from one of the world’s largest arms importers into a defence manufacturing and export hub.

The emphasis is shifting toward:

- indigenous production,
- co-development,
- and technology absorption.

Thus, India increasingly prefers partnerships involving:

- technology transfer,
- joint manufacturing,
- and domestic industrial ecosystems.

South Korea fits this requirement better than many traditional defence suppliers.

ADDITIONAL RECENT DEVELOPMENTS

Several recent developments deepen the strategic partnership:

- India and South Korea are exploring expansion of the K9 Vajra model into air-defence systems and futuristic military platforms.
- Defence industry roundtables in Seoul emphasized supply-chain partnerships and co-production.

- Both countries are discussing deeper cooperation in AI, cyber technologies, and autonomous defence systems.
- Joint Working Groups on space cooperation and defence technology are being institutionalized.
- Strategic discussions increasingly connect defence cooperation with semiconductors, shipbuilding, and critical minerals.

CHALLENGES BEFORE KIND-X

Despite enormous potential, several challenges remain.

1. **Funding Mechanisms:** Defence innovation requires sustained capital investment.
2. **Export Control Regimes:** Military technologies involve strict legal and security restrictions.
3. **Intellectual Property Issues:** Joint R&D often creates disputes regarding ownership and licensing.
4. **Bureaucratic Delays:** Defence procurement systems are traditionally slow and complex.
5. **Technology Absorption:** Technology transfer succeeds only when domestic industrial ecosystems can absorb and scale innovation.

CONCLUSION

The launch of KIND-X marks the beginning of a new phase in India–South Korea relations.

It reflects a transition:

- from procurement to partnership,
- from arms imports to innovation,
- and from transactional defence ties to ecosystem integration.

In many ways, KIND-X captures the essence of 21st-century geopolitics that military power increasingly emerges from technological ecosystems rather than isolated military factories.

Ultimately, the real significance of KIND-X lies in one deeper reality:

The future wars of the 21st century may be fought with AI, chips, drones, and autonomous systems but they will be won by countries capable of building collaborative innovation ecosystems faster than their competitors.

11th Quad Foreign Ministers' Meeting (FMM)

Why in News: At the 11th Quad Foreign Ministers' Meeting (FMM) held in New Delhi, India and the United States signed **a framework for cooperation on critical minerals and rare earths.** Simultaneously, the Quad launched a Critical Minerals Initiative Framework, an Indo-Pacific Energy Security Initiative, and new maritime surveillance mechanisms aimed at strengthening regional resilience and supply-chain security.

Key Highlights

1. India–US Critical Minerals Framework

India and the United States agreed to deepen cooperation across the entire critical minerals value chain:

- **Exploration and mining**
- **Processing and refining**
- **Recycling and recovery**
- **Investments and financing mechanisms**
- **Management of rare-earth scrap and waste**

The framework seeks to build resilient and diversified supply chains and reduce vulnerabilities arising from excessive dependence on a single source of supply.

2. Quad Critical Minerals Initiative Framework

The Quad countries launched a common framework to:

- **Strengthen supply chains for critical minerals.**
- **Coordinate investments and policy tools.**
- **Promote mining, processing and recycling projects.**
- **Encourage private-sector participation and financing.**
- **Support projects located within Quad countries and operated by Quad-based companies.**

The initiative aims to mobilise substantial public and private investment for developing secure mineral supply chains.

Why are Critical Minerals Important?

Critical minerals such as lithium, cobalt, nickel, graphite and rare-earth elements are indispensable for:

- **Electric vehicles (EVs)**
- **Semiconductors**
- **Defence equipment**
- **Renewable energy technologies**
- **Artificial intelligence and advanced electronics**

Their strategic importance has increased as countries pursue energy transition and technological self-reliance.

China Factor

The initiatives come against the backdrop of China's dominance in the processing and refining of rare earths and its export restrictions on several strategic minerals.

These developments exposed vulnerabilities in global supply chains and accelerated efforts by major economies to diversify sourcing and build alternative supply networks.

Maritime Security Initiatives

Indo-Pacific Maritime Surveillance Collaboration (IPMSC)

The Quad launched a new maritime surveillance mechanism that will:

- Integrate maritime monitoring capabilities of member countries.
- Improve information sharing.
- Strengthen monitoring of maritime activities across the Indo-Pacific.

Expansion of Indo-Pacific Maritime Domain Awareness (IPMDA)

The initiative will provide:

- Near real-time maritime data.
- Better tracking of commercial shipping.
- Enhanced disaster response and humanitarian assistance capabilities.

These measures seek to improve transparency and security in critical sea lanes.

Energy Security Cooperation

The Quad also announced the **Quad Initiative on Indo-Pacific Energy Security** to:

- Enhance regional energy resilience.
- Improve emergency response mechanisms.
- Coordinate energy-related policies.
- Facilitate technology sharing and market analysis.
- Protect energy supply chains from geopolitical disruptions.

The initiative assumes significance amid tensions affecting global energy flows through the Strait of Hormuz and other strategic maritime chokepoints.

Significance for India

UPSC Mains Value Addition

"Critical minerals are emerging as the new geopolitics of energy and technology. Control over their supply chains may shape strategic power in the 21st century much like oil did in the 20th century."

Strategic

- Reduces dependence on concentrated mineral suppliers.
- Enhances India's role in emerging technology supply chains.
- Strengthens cooperation with Quad partners in the Indo-Pacific.

Economic

- Encourages investment in mineral exploration and processing.
- Supports India's clean-energy and manufacturing ambitions.
- Contributes to the objectives of the Semiconductor Mission and EV ecosystem.

Geopolitical

- Supports the broader strategy of "de-risking" supply chains.
- Enhances India's position in shaping future economic and technological governance.
- Reinforces the Quad's evolution from a primarily security-focused grouping to a broader platform for economic and technological cooperation.

About the Quad

The Quadrilateral Security Dialogue (Quad) is an informal strategic partnership comprising:

- India
- United States
- Japan
- Australia

India–US Relations (Marco Rubio’s Visit)

U.S. Secretary of State Marco Rubio's four-day visit to India in May 2026 was his first official visit since assuming office. Beyond participating in the Quad Foreign Ministers' Meeting, the visit was widely viewed as an attempt to stabilise India–U.S. relations, which had witnessed unusual strains over the preceding year.

Several developments had generated concerns in New Delhi:

- Higher U.S. tariff measures affecting Indian exports.
- Restrictions relating to visas, immigration and outsourcing.
- Sanctions and uncertainties impacting India's energy procurement and investments.
- Divergences over regional developments involving Iran, China and Pakistan.
- Statements by sections of the U.S. administration that were perceived as insensitive towards India.

Compounding these concerns were the economic repercussions of instability in West Asia, particularly the conflict involving Iran and disruptions around the Strait of Hormuz, a critical energy corridor for India. These developments heightened India's energy-security concerns and reinforced the need for closer strategic consultations with Washington.

Key Outcomes of the Visit

The most significant outcome was the signing of the India–U.S. Framework on Critical Minerals and Rare Earths, aimed at strengthening cooperation in mining, processing, recycling, financing and supply-chain resilience.

In addition, discussions covered:

- **Trade and economic cooperation**
- **Energy security**
- **Defence partnership**
- **Civil nuclear cooperation**
- **Emerging technologies such as Artificial Intelligence**
- **Indo-Pacific security and maritime cooperation**
- **Mobility and migration issues**

Limited Deliverables, Larger Strategic Message

Despite extensive diplomatic engagement and high-level interactions, the visit produced relatively few concrete bilateral outcomes beyond the critical minerals' agreement. This suggests that while both countries remain committed to their Comprehensive Global Strategic Partnership, unresolved concerns continue to affect the relationship.

The visit therefore highlighted an important reality of contemporary India–U.S. relations:

The partnership remains strategically indispensable, but managing differences on trade, energy security, technology access and regional geopolitics has become increasingly important.

Conclusion

Its objective is to promote a **free, open, inclusive, resilient and rules-based Indo-Pacific**, with cooperation spanning maritime security, critical technologies, infrastructure, climate action, supply chains and disaster response.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. Critical minerals have become central to economic security and strategic autonomy in the contemporary world. Examine the significance of recent Quad initiatives in this regard. (15 Marks, 250 Words)

UAE’s Exit from OPEC

Why in News: In a surprising move, the **United Arab Emirates (UAE)** announced that it would withdraw from the **Organization of the Petroleum Exporting Countries (OPEC)** and the broader OPEC+ arrangement. The announcement came just days before the scheduled OPEC meeting and amid tensions surrounding disruptions in the **Strait of Hormuz**, making the decision geopolitically significant.

Although speculation about UAE’s dissatisfaction with OPEC had existed for years, the timing and speed of the decision surprised global energy markets.

Main Issue (Why Did UAE Leave OPEC?)

1. Conflict Between Production Capacity and OPEC Quotas

The central reason behind UAE’s exit is the mismatch between its growing oil production capacity and OPEC’s production restrictions.

The UAE possesses one of the world’s largest oil reserves and has invested heavily to raise production capacity close to **5 million barrels per day (mbpd)**. However, OPEC quotas limited its actual output significantly below this capacity.

For Abu Dhabi, maintaining unused capacity meant:

- Lower export earnings
- Reduced return on energy investments
- Constraints on financing economic diversification

2. Preparing for the “Peak Oil” Era

The UAE appears to believe that global oil demand may gradually approach a **“Peak Oil”** stage—when oil consumption reaches its maximum before entering long-term decline.

Its strategy reflects a simple calculation:

Sell more oil now while prices and demand remain favourable.

Higher revenues are expected to support investments in:

- **Artificial Intelligence (AI)**
- **Data centres**

- Advanced technology industries
- Economic diversification beyond hydrocarbons

- Regional leadership
- Economic competition

3. Assertion of Strategic Autonomy

The move also carries geopolitical significance. For years, tensions have existed between the UAE and Saudi Arabia over:

- Oil production policy

UAE's departure signals a shift from collective Gulf energy coordination towards a "UAE-first" national strategy, where domestic economic interests receive priority over cartel discipline.

ABOUT OPEC AND OPEC+

① WHAT IS OPEC?

OPEC (Organization of the Petroleum Exporting Countries) is an intergovernmental organization formed in 1960 to coordinate petroleum policies among major oil-producing countries.

Objectives:

- Stabilise oil prices
- Coordinate production levels
- Ensure predictable oil supply

② ABOUT OPEC+

- **OPEC+** is an expanded grouping consisting of OPEC member countries + major non-OPEC oil-producing countries that cooperate to manage global oil supply.
- It was formally created in 2016 after the sharp fall in global oil prices.
- The objective is to coordinate production decisions, stabilise oil markets and reduce extreme price fluctuations.

Major OPEC+ members:

- OPEC members (Saudi Arabia, Iraq, UAE, Kuwait, etc.)
- Non-OPEC partners led by **Russia**, along with countries such as Kazakhstan and Oman.

How does OPEC+ work?

- When oil prices fall → members may **cut production** → supply decreases → prices support upward.
- When prices rise sharply → members may **increase production** → supply expands → prices stabilise.

Importance of OPEC+:

- Controls a significant share of global crude output.
- Influences international energy prices and inflation.
- Plays a major role in global energy security and market stability.

③ WHY ARE PRODUCTION QUOTAS IMPORTANT?

OPEC regulates supply through quotas:

Lower supply → Higher prices	Higher supply → Lower prices
------------------------------	------------------------------

This mechanism gives OPEC significant influence over global oil markets.

④ DIFFERENCE BETWEEN OPEC AND OPEC+

OPEC	OPEC+
Only OPEC member countries.	OPEC members + cooperating non-OPEC producers (especially Russia).

Global Implications

Weakening of OPEC's Influence

UAE's withdrawal reduces OPEC's ability to collectively manage supply and prices.

Possible consequences:

- Greater competition among oil exporters
- Higher market volatility
- Reduced cartel effectiveness
- Increased role of independent producers such as the United States, Brazil and Canada

Note: Analysts suggest the move may increase medium-term oil supply and intensify competition for market share.

Shift in Global Energy Governance

The decision may encourage other producers to prioritise national energy strategies over collective arrangements, gradually weakening traditional producer alliances.

Implications for India

India, the world's **third-largest crude oil importer**, could view this development as both an opportunity and a challenge.

Opportunities

- Possibility of relatively lower oil prices if supply expands
- Improved bargaining power for Indian importers
- Greater energy security through diversified sourcing
- Scope for stronger India-UAE energy cooperation

India and the UAE already maintain strong strategic and trade ties.

Challenges

- Oil price volatility may continue due to geopolitical tensions
- Dependence on Gulf energy remains high
- Supply disruptions in West Asia can still affect India

Way Forward

For India

1. Deepen strategic energy partnership with the UAE.
2. Encourage joint investments in:
 - Refineries
 - Petrochemicals
 - Strategic petroleum reserves
3. Accelerate transition towards renewable energy.
4. Diversify crude imports beyond West Asia.
5. Strengthen long-term energy diplomacy.

For Global Energy Governance

- Move from rigid production cartels towards flexible energy coordination.
- Balance oil security with clean energy transition.

Conclusion

UAE's exit from OPEC is more than an oil policy decision—it reflects changing energy economics, regional geopolitics, and emerging national strategies in the Gulf. While OPEC is unlikely to disappear immediately, the move signals a gradual erosion of collective producer power and the emergence of a more competitive global oil order. For India, this transition offers opportunities to strengthen energy security while preparing for a changing energy landscape.

India's Diplomatic Summer

Why in News: India has entered an exceptionally active diplomatic season with:

- **Prime Minister Narendra Modi's multi-nation outreach across Europe and the Indian Ocean region,**
- **External Affairs Minister S. Jaishankar's engagements with the Caribbean and BRICS nations,**
- **upcoming Quad and BRICS meetings,**
- **revival of the India-Africa Summit after more than a decade,**
- **and renewed emphasis on India's global messaging strategy.**

Note: The developments follow the 11th Heads of Mission Conference in New Delhi, where Prime Minister Modi reportedly urged Indian diplomats to become more "proactive" and improve India's international image through faster and more positive strategic communication. The diplomatic surge reflects India's attempt to shape a rapidly transforming global order marked by:

- geopolitical polarization,
- wars in West Asia and Ukraine,
- China's expanding influence,
- disruptions in global trade,
- and uncertainty surrounding the future of multilateral institutions.

THE BIGGER PICTURE (INDIA IS SHIFTING FROM "BALANCING POWER" TO "SHAPING POWER")

For decades, India's foreign policy primarily focused on:

- **strategic autonomy,**
- **regional stability,**
- **and non-alignment.**

However, contemporary Indian diplomacy is increasingly moving toward issue-based leadership, coalition-building, and agenda-setting in global governance. India is no longer merely reacting to global developments. It is attempting to influence them.

WHY THE HEADS OF MISSION CONFERENCE MATTERS

The 11th Heads of Mission Conference may appear routine, but it reflects a deeper transformation in India's diplomatic thinking.

Prime Minister Modi reportedly emphasized:

- faster communication,
- stronger global projection,
- and "positive messaging" about India.

This signals recognition that modern geopolitics is increasingly driven not only by military or economic power, but also by narrative power.

DIPLOMACY TODAY IS ALSO AN INFORMATION WAR

In the 21st century, perception shapes policy, narratives influence investment, and digital diplomacy affect geopolitical legitimacy.

Countries now compete not just for territory or markets, but also for international opinion, technological standards, media narratives, and strategic influence.

India therefore seeks to project itself as:

- **a stable democracy,**
- **a technological power,**
- **a civilizational state,**
- **and a voice of the Global South.**

The stress on “slow speed” in communication reportedly expressed during the conference indicates concern that India is not always winning the global narrative battle despite expanding strategic influence.

SPECIAL FOCUS ON THE NEIGHBOURHOOD

An important takeaway from the conference was the emphasis on India’s neighbourhood.

The Prime Minister reportedly stressed the need for more “experienced hands” in neighbouring countries and referred to the appointment of politician Dinesh Trivedi as High Commissioner to Bangladesh.

This reflects India’s growing awareness that the neighbourhood remains the primary theatre of strategic competition with China.

WHY INDIA’S NEIGHBOURHOOD MATTERS SO MUCH

South Asia is central to India’s security, connectivity, trade, water security, migration management, and strategic depth.

However, in recent years China has expanded infrastructure investments, political influence, and economic penetration across Nepal, Sri Lanka, Maldives, Bangladesh, and Myanmar. India’s renewed diplomatic activism in the region is therefore partly aimed at:

- **rebuilding trust,**
- **preventing strategic encirclement,**
- **and strengthening regional integration.**

JAISHANKAR’S CARIBBEAN TOUR:

WHY SMALL STATES MATTER

External Affairs Minister S. Jaishankar’s visit to Jamaica, Suriname, and Trinidad & Tobago may appear secondary compared to major power diplomacy, but it is strategically important.

These countries are members of the Caribbean Community (CARICOM), a grouping of small island developing states.

THE NEW GEOPOLITICS OF SMALL STATES

Traditionally, global diplomacy focused on great powers.

Today, even small states matter because:

- each possesses one vote in the United Nations,
- they influence climate negotiations,
- they shape maritime governance,
- and they play a role in multilateral coalitions.

India is increasingly investing in development partnerships, digital cooperation, healthcare, renewable energy, and diaspora diplomacy across the Caribbean and Pacific regions. The Indian diaspora in Trinidad & Tobago, Suriname, and Guyana also forms an important cultural bridge. This outreach strengthens India’s image as a development partner rather than a hegemonic power.

THE BRICS MOMENT

CAN INDIA BALANCE CONTRADICTIONS?

India will host the BRICS ministerial process and later the BRICS Summit in 2026 as chair.

However, BRICS today is no longer a simple economic grouping.

It has evolved into:

- a platform challenging Western dominance,
- a voice of the Global South,
- and increasingly, a geopolitical balancing coalition.

Yet BRICS is deeply divided internally.

THE INTERNAL CONTRADICTIONS OF BRICS

The grouping now includes Iran, UAE, Egypt, Ethiopia, and Indonesia, alongside original members.

But several tensions exist India-China rivalry, Iran-UAE disagreements, differing positions on Gaza, and varying approaches toward the West.

This explains why previous BRICS meetings struggled to produce consensus statements on:

- **Israel-Palestine,**
- **West Asia,**
- **and sanctions regimes.**

INDIA’S EUROPEAN OUTREACH

Prime Minister Modi’s proposed Europe tour covering Netherlands, Sweden, Norway, Italy, and the Vatican reflects the rapid strategic convergence between India and Europe.

WHAT IS DRIVING INDIA-EUROPE CLOSENESS?

Several factors are reshaping India-Europe ties:

1. China Concerns

Europe increasingly seeks alternatives to excessive dependence on China. India emerges as a large market, democratic manufacturing hub, and strategic Indo-Pacific partner.

2. Supply Chain Diversification

Post-pandemic disruptions and geopolitical tensions have accelerated “friend-shoring” and diversification.

India hopes to become:

- a manufacturing destination,
- semiconductor partner,
- and technology collaborator.

3. Defence and Strategic Cooperation

Europe is now more willing to engage India on:

- maritime security,
- defence technology,
- cyber governance,
- and critical minerals.

THE FREE TRADE DIMENSION

Negotiations surrounding the India-EU Free Trade Agreement, and the European Free Trade Association (EFTA) are strategically significant.

These agreements could:

- expand market access,
- boost investments,
- strengthen supply chains,
- and accelerate technology transfers.

For India, FTAs today are no longer merely trade instruments. They are becoming geopolitical-economic tools.

WEST ASIA

Despite the broad diplomatic agenda, one issue overshadows nearly every engagement is instability in West Asia.

The Gaza war, tensions involving Iran, attacks on shipping routes, and fears regarding Hormuz Strait disruptions have transformed West Asia into the central geopolitical crisis zone affecting energy security, global inflation, maritime trade, and strategic alignments.

India's diplomacy here is especially delicate because it maintains:

- **strong ties with Israel,**
- **deep strategic partnerships with Gulf countries,**
- **and historic relations with Iran.**

Very few countries today possess working relations with all sides simultaneously. This gives India a unique diplomatic advantage — but also creates balancing pressures.

INDIA'S INDO-PACIFIC STRATEGY

India will also host the Quad Foreign Ministers Meeting involving India, United States, Japan, and Australia.

The Quad has evolved from a loose consultation forum into:

- a strategic Indo-Pacific platform,
- technology partnership mechanism,
- maritime coordination framework,
- and supply-chain coalition.

While the Quad avoids explicitly naming China, its emergence is closely tied to:

- concerns regarding Chinese assertiveness,
- militarization of the Indo-Pacific,
- and rules-based maritime order.

India's participation demonstrates how it simultaneously:

- partners with the U.S.-led Indo-Pacific framework,
- while remaining active in BRICS alongside China and Russia.

This dual engagement is one of the defining features of Indian foreign policy today.

THE RETURN OF THE INDIA-AFRICA SUMMIT

One of the most important announcements is the revival of the India-Africa Summit after more than a decade.

This is strategically significant because Africa is becoming central to:

- energy transitions,
- critical minerals,
- maritime routes,
- demographic growth,
- and future markets.

India seeks to differentiate itself from China in Africa by emphasizing:

- capacity building,
- skill development,
- digital public infrastructure,
- healthcare,
- and human-centric development partnerships.

The summit is expected to reinforce India's positioning as the leading advocate of the Global South.

INDIA'S FOREIGN POLICY MODEL (MULTI-ALIGNMENT)

The current diplomatic season highlights India's evolving doctrine of multi-alignment.

Unlike Cold War non-alignment, modern Indian diplomacy involves:

- engaging multiple rival blocs simultaneously,
- avoiding formal alliances,
- and maximizing strategic flexibility.

Thus, India today can:

- buy oil from Russia,
- deepen defence ties with the U.S.,
- participate in Quad,
- lead BRICS,
- engage Europe,
- and maintain relations with Gulf powers simultaneously.

CHALLENGES BEFORE INDIA

Despite expanding influence, several challenges remain:

1. Managing China Competition

India must balance competition with China while avoiding direct escalation.

2. Balancing Russia-West Relations

The Ukraine war continues to complicate India's strategic equations.

3. Converting Diplomacy into Economic Gains

India's diplomatic visibility must translate into:

- trade,
- technology transfers,
- investments,
- and manufacturing growth.

4. Narrative Management

India increasingly faces global scrutiny on:

- democracy,
- human rights,
- social tensions,
- and domestic politics.

Hence the emphasis on stronger diplomatic communication.

CONCLUSION

India's current diplomatic outreach represents far more than a busy calendar of foreign visits.

It reflects the emergence of a new strategic ambition transforming India from a balancing power into a shaping power in world politics.

Maritime Security in an Era of West Asian Conflict

Why in News: India, as the Chair of the Indian Ocean Rim Association (IORA) for the 2025–27 period, hosted the 10th Indian Ocean Dialogue in New Delhi under the theme “**Indian Ocean Region in a Transforming World.**”

The discussions occurred amid:

- **escalating instability in West Asia,**
- **tensions surrounding the Strait of Hormuz,**
- **disruptions in maritime trade routes,**

- **and growing concerns regarding energy and food security.**

IORA Secretary-General Sanjiv Ranjan stated that maritime safety and security have become “of primordial importance” for the Indian Ocean region.

The developments underline a major geopolitical shift that the Indian Ocean is no longer merely a trade corridor — it is becoming the central strategic theatre of the 21st century.

WHY DOES THE INDIAN OCEAN MATTER SO MUCH?

- To understand the importance of IORA and maritime security, one must first understand a fundamental reality that the Indian Ocean is the economic bloodstream of the world.
- Nearly 80% of global seaborne oil trade, major LNG shipments, critical container traffic, and large portions of global trade pass through the Indian Ocean Region (IOR).
- The region connects West Asia, Africa, South Asia, Southeast Asia, and the Indo-Pacific.
- For India specifically, the Indian Ocean is not peripheral geography. It is:
 - a strategic shield,
 - economic highway,
 - energy lifeline,
 - and geopolitical sphere of influence.

THE RETURN OF MARITIME GEOPOLITICS

- For much of the post-Cold War period, globalization created the illusion that trade routes were secure, maritime commerce was neutral, and economic interdependence reduced conflict.
- That illusion is collapsing. The Russia–Ukraine War, Red Sea disruptions, Gaza conflict, Iran–U.S. tensions, and Hormuz Strait instability have demonstrated that maritime chokepoints can instantly destabilize the global economy. The Indian Ocean has therefore re-emerged as the frontline of geoeconomics.

THE STRAIT OF HORMUZ

THE WORLD’S ENERGY CHOKEPOINT

- The Strait of Hormuz is among the world’s most strategically sensitive waterways.
- Located between Iran, and Oman/UAE, it handles nearly one-fourth of global crude oil trade. Any disruption here affects oil prices, shipping insurance, inflation, food prices, and global growth.
- The recent tensions involving U.S.–Iran confrontation, naval attacks, and shipping disruptions revealed how fragile maritime supply chains have become.
- For Indian Ocean countries, this is not an abstract geopolitical issue. It directly affects livelihoods, fisheries, tourism, energy costs, and economic stability.

WHAT IS IORA?

- The Indian Ocean Rim Association (IORA) is a regional organisation established in 1997 to promote economic cooperation, maritime security, trade, blue economy, and sustainable development among Indian Ocean littoral states.

- The idea received strong support from Nelson Mandela, who envisioned the Indian Ocean as “a zone of peace and cooperation.”
- Today, IORA has 23 member states spanning:
 - Africa,
 - West Asia,
 - South Asia,
 - Southeast Asia,
 - and Australia.
- The organisation focuses on several priority areas:
 - **maritime safety and security,**
 - **trade and investment,**
 - **fisheries management,**
 - **disaster risk reduction,**
 - **blue economy,**
 - **tourism,**
 - **and women’s economic empowerment.**

WHY INDIA’S CHAIRMANSHIP IS IMPORTANT

India assumed the Chairship of IORA for the 2025–27 period. This is strategically significant for several reasons.

1. INDIA WANTS TO SHAPE THE INDIAN OCEAN ORDER

India increasingly sees itself as the primary resident power of the Indian Ocean. Its maritime vision has evolved from “Look East” to “Act East,” and now toward Indo-Pacific strategy, SAGAR, and MAHASAGAR.

MAHASAGAR

Prime Minister Narendra Modi’s Vision MAHASAGAR stands for:

“Mutual and Holistic Advancement for Security and Growth Across Regions.”

It reflects India’s attempt to build cooperative maritime governance, resilient connectivity, and regional stability.

The vision emphasizes:

- inclusiveness,
- development partnerships,
- maritime security,
- and sustainable ocean governance.

2. India wants to prevent external domination

The Indian Ocean has become an arena of strategic competition involving:

- China,
- United States,
- regional powers,
- and middle powers.

China’s expanding presence through ports, naval deployments, dual-use infrastructure, and the “String of Pearls” has increased strategic anxieties. India therefore seeks to strengthen maritime partnerships, regional institutions, and cooperative security frameworks. Unlike military alliances, IORA offers a softer, cooperative platform for regional influence.

3. Iora gives India a less contentious platform

Unlike:

- SAARC,
- or SCO,

IORA is relatively less politically divisive for India. An important reason is Pakistan is not a member. Pakistan’s earlier

membership request reportedly did not progress because of trade-related disagreements concerning “MFN status” obligations under IORA principles.

This allows India to pursue:

- maritime diplomacy,
- connectivity,
- and regional cooperation without South Asian bilateral deadlocks dominating discussions.

THE WEST ASIA WAR AND THE INDIAN OCEAN

One of the most important developments in recent months has been the spillover of West Asian conflicts into the Indian Ocean region.

Mauritius Foreign Minister Dhananjay Ramful warned during the Dialogue that “war has come” to the Indian Ocean.

He referred to:

- attacks involving Diego Garcia,
- missile threats,
- and naval confrontations

as signs that the Indian Ocean’s traditional “zone of peace” identity is eroding.

This marks a major geopolitical transformation that conflicts are no longer geographically contained. Wars in West Asia now affect African economies, Indian fuel prices, Southeast Asian trade, and island-state tourism simultaneously.

WHY SMALL ISLAND STATES ARE WORRIED

Countries such as Mauritius, Maldives, Seychelles, Comoros, and Madagascar are highly vulnerable to maritime instability. Because their economies depend heavily on tourism, fisheries, maritime trade, and imported fuel.

Even minor shipping disruptions can produce:

- inflation,
- unemployment,
- food shortages,
- and fiscal stress.

Thus, for many Indian Ocean states “maritime security” is economic survival.

INDIA’S MARITIME STRATEGY

Historically, India’s strategic thinking was largely continental:

- Pakistan,
- Himalayas,
- and land borders dominated security planning.

But contemporary geopolitics is forcing India toward maritime strategic thinking. Because over 90% of India’s trade by volume moves by sea, energy imports depend on maritime routes, and Indo-Pacific geopolitics is increasingly ocean-centric.

This explains naval modernization, port diplomacy, island partnerships, and India’s growing focus on maritime domain awareness.

OPERATION SANKALP AND MARITIME SECURITY

Recent crises have highlighted the importance of naval protection. Under Operation Sankalp, India deployed naval assets to protect merchant vessels and energy shipments amid regional instability. This reflects an important

transformation that navies are no longer only military instruments; they are now guardians of economic security.

CHINA IN THE INDIAN OCEAN:

Although IORA officially avoids contentious bilateral issues, China’s growing Indian Ocean footprint remains a major strategic undercurrent.

China has expanded port access, increased naval deployments, invested in maritime infrastructure, and enhanced influence across littoral states.

Examples include:

- **Gwadar (Pakistan),**
- **Hambantota (Sri Lanka),**
- **Djibouti,**
- **and projects in East Africa.**

India’s challenge is therefore twofold:

- maintaining regional trust,
- while preventing strategic encirclement.

IORA provides India a diplomatic mechanism to:

- reinforce cooperative leadership,
- without directly framing the region in adversarial terms.

WHY THE 2027 IORA SUMMIT MATTERS?

The proposed 2027 IORA Leaders’ Summit will mark the organisation’s 30th anniversary. Notably, the last leaders’ summit occurred in Jakarta in 2017.

India now seeks to:

- revive IORA’s strategic relevance,
- institutionalize cooperation,
- and position the Indian Ocean as a coherent geopolitical space.

This is important because regional institutions shape regional orders.

Just as:

- **ASEAN shapes Southeast Asia,**
- **the EU shapes Europe,**
- **and the African Union shapes continental diplomacy,**

India hopes IORA can evolve into the principal platform for Indian Ocean governance.

CONCLUSION

The current instability in West Asia has revealed a profound geopolitical reality that the future of global power will increasingly be shaped at sea.

The Indian Ocean today is:

- an energy corridor,
- a trade superhighway,
- a strategic battleground,
- and a development lifeline simultaneously.

India’s IORA Chairship therefore comes at a historic moment. The challenge before New Delhi is not merely to host meetings or issue declarations. It is to shape maritime governance, build resilient regional institutions, secure sea lanes, and prevent the Indian Ocean from becoming a theatre of uncontrolled great-power rivalry.

ECONOMY & AGRICULTURE

Fiscal Health and Electoral Outcomes

Why in News: The 2026 Assembly election outcomes in states like Assam, Kerala, Tamil Nadu, and West Bengal highlight the role of economic performance growth, jobs, and fiscal management in shaping voter behaviour.

Key Details

- Voters across states delivered decisive mandates, reflecting approval or rejection of economic governance. Economic indicators such as income growth, unemployment, and fiscal discipline influenced electoral outcomes.
- States like Assam showed high economic growth, while Kerala and West Bengal recorded relatively slower gains. This divergence highlights regional disparities in development and governance models.
- Unemployment and job demand remain critical challenges amid India's demographic transition. States with higher job stress witnessed stronger voter reactions.
- Fiscal health, including deficits and debt burden, will shape future policy choices of new governments. Weak finances can limit developmental spending and long-term growth.

Economic Growth and Income Trends

- **Gross State Domestic Product (GSDP):** It measures the total economic output of a state. Higher GSDP growth reflects stronger economic performance and better opportunities.
- **Assam's Growth Story:** Assam recorded one of the fastest GSDP growth rates among major states. This led to rapid improvement in per capita income, though it still lags in absolute terms.
- **Tamil Nadu's Performance:** Tamil Nadu achieved steady and relatively high growth. Its per capita income has surpassed Kerala due to consistent economic expansion.
- **Kerala and West Bengal:** These states recorded modest growth in income levels. Slower growth has impacted job creation and economic dynamism.

Per Capita Income and Development

- **Definition:** Per capita income is the average income earned per person in a state. It is used as a proxy for standard of living and economic well-being.
- **Income Convergence:** Assam has improved significantly and is catching up with West Bengal. This indicates reduction in regional inequality over time.
- **Inter-State Variation:** Southern states like Tamil Nadu show higher income levels. This reflects better industrialisation and service sector growth.
- **Policy Implication:** Higher income growth often translates into better electoral outcomes. Voters tend to reward governments delivering economic prosperity.

Unemployment and Labour Market

- **Labour Force Participation Rate (LFPR):** Indicates the percentage of working-age population seeking jobs. Higher LFPR reflects greater demand for employment opportunities.
- **Unemployment Rate:** Measures the percentage of people who are willing to work but cannot find jobs. It is a key indicator of economic stress in society.
- **West Bengal Scenario:** High LFPR combined with high unemployment suggests job scarcity. This creates dissatisfaction among youth and working population.
- **Kerala and Tamil Nadu:** Lower unemployment but also varying job demand levels. This indicates structural differences in labour markets across states.

Fiscal Deficit and Government Borrowing

- **Fiscal Deficit:** It is the gap between total expenditure and total revenue of a government. It indicates how much a government needs to borrow.
- **Prudential Limit:** The recommended fiscal deficit is around 3% of GSDP. Crossing this limit may lead to unsustainable debt levels.
- **West Bengal's Position:** It has exceeded the recommended fiscal deficit threshold. This raises concerns about long-term fiscal sustainability.
- **Importance:** High fiscal deficit reduces fiscal space for development spending. It can also increase inflationary pressures and debt burden.

Revenue Deficit and Quality of Spending

- **Revenue Deficit:** Occurs when revenue expenditure exceeds revenue receipts. It indicates borrowing for day-to-day expenses rather than investment.
- **Concern for States:** Most states (except Assam) face revenue deficit challenges. This limits their ability to invest in infrastructure and growth.
- **Capital vs Revenue Spending:** Ideally, borrowing should fund capital assets like roads and infrastructure. Revenue deficit implies inefficient use of borrowed funds.
- **Fiscal Quality Indicator:** Lower revenue deficit reflects better fiscal management. It ensures long-term economic sustainability.

Rising Debt and Interest Burden

- **Interest Payments:** A large share of state revenue is used to repay past loans. This reduces funds available for development programmes.
- **Kerala and Tamil Nadu:** These states have seen a sharp rise in interest burden. It indicates growing dependence on borrowing.
- **Debt Trap Risk:** Continuous borrowing leads to accumulation of debt. This may result in fiscal stress and reduced policy flexibility.
- **Policy Challenge:** Managing debt sustainably is a key governance priority. States must balance welfare spending with fiscal discipline.

Freebies vs Productive Investment Debate

- **Unconditional Transfers:** Many states spend heavily on cash transfers and subsidies. These are aimed at immediate relief to citizens.

- **West Bengal Example:** A significant share of revenue is spent on such schemes. This raises concerns about long-term fiscal sustainability.
- **Economic Impact:** Excessive freebies may crowd out capital expenditure. This affects long-term growth and job creation.

• THE STORY SO FAR

1. The state of income growth

PER CAPITA GSDP (in Rs cr)

■ 2014-15 ■ 2023-24



COMPOUND ANNUAL GROWTH RATE (CAGR, in %)

State	Per capita GSDP	GSDP
Assam	7.80%	11.40%
Kerala	4.90%	8.60%
TN	6.40%	10.30%
WB	4.90%	9.10%

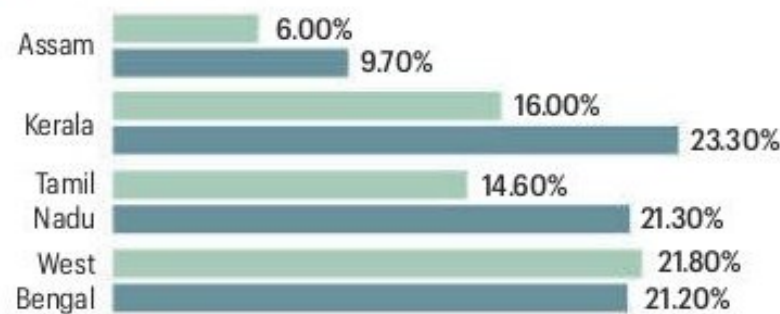
NOTE: PER CAPITA INCOME, OWN REVENUE, AND EXPENDITURE HAVE BEEN CALCULATED USING STATE-WISE POPULATION PROJECTIONS FOR THE RESPECTIVE YEARS USING POPULATION PROJECTIONS BY THE NATIONAL COMMISSION OF POPULATION.

SOURCES: RBI; MOSPI; NATIONAL COMMISSION ON POPULATION; STATE BUDGET DOCUMENTS OF VARIOUS STATES FOR 2025-26; PRS

3. Rising interest burden for govts

INTEREST PAYMENTS AS A % OF REVENUE RECEIPTS

■ 2016-17 ■ 2024-25



SOURCES: RBI; CAG; MOSPI; PRS

Governance Challenges for Chief Ministers

- **Balancing Growth and Welfare:** Governments must ensure both economic growth and social support. This requires efficient allocation of resources.
- **Job Creation:** Addressing unemployment remains a major challenge. Policies must focus on skill development and industrial growth.
- **Fiscal Discipline:** Maintaining deficit and debt within limits is essential. It ensures long-term economic stability.
- **Inclusive Development:** Reducing regional and income disparities is crucial. This helps in achieving equitable growth across states.

Way Forward

- **Strengthening Fiscal Responsibility:** States must adhere to deficit limits and improve revenue generation.

2. State of unemployment

States	Labour Force Participation Rate in % (July-Sept 2025-26)	Unemployment Rate*
Assam	60.4	5.2
Kerala	59.4	3.7
Tamil Nadu	58.6	5.7
West Bengal	61	6.1
India	55.1	5.2

*ACCORDING TO CURRENT WEEKLY STATUS FOR PERSONS 15 YEARS AND ABOVE; SOURCE: ECONOMIC SURVEY 2026

4. State of govt finances

State	Fiscal Deficit as a % of Gross State Domestic Product	Revenue Deficit as a % of GSDP	Unconditional Cash Transfers as a % of revenue receipts
Assam	2.5	0	4.30%
Kerala	3	-1.9	NA
TN	2.8	-1.2	4.20%
WB	3.2	-1.7	10%

SOURCE: PRS; ALL DATA IS 2025-26 BE

This will enhance financial stability and investor confidence.

- **Focus on Capital Expenditure:** Investment in infrastructure and industry is essential. It generates employment and boosts long-term growth.
- **Labour Market Reforms:** Improving skill development and job creation mechanisms is necessary. This will address unemployment challenges effectively.
- **Balanced Welfare Policies:** Welfare schemes should be targeted and sustainable. This ensures social security without compromising fiscal health.

Conclusion

State-level economic performance plays a crucial role in shaping electoral outcomes. Sustainable growth, job creation,

and sound fiscal management are key to long-term development and governance success in India.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. With reference to fiscal indicators, consider the following statements:

1. Fiscal deficit represents the total borrowing requirement of the government.
2. Revenue deficit implies borrowing for capital expenditure.
3. A high interest payment burden reduces fiscal space for development.

How many of the above statements are correct?

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

Answer: (b)

Descriptive Question

Q. "State finances and employment trends are critical determinants of electoral outcomes in India." Discuss with suitable examples. (250 words, 15 Marks)

RBI Promotion Policy

Why in News: Employees of the Reserve Bank of India staged protests across multiple RBI offices against the revised internal promotion policy, which links promotions to vacancies instead of the earlier time-bound system.

Key Details

- The revised RBI promotion policy retains time-bound promotion only from Grade B to Grade C, while higher promotions will depend on vacancies. This has raised concerns regarding career stagnation and lack of predictable progression among officers.
- The Reserve Bank of India Officers' Association has demanded reconsideration of the policy through consultation with employee representatives. The association argues that the revised framework ignores long-standing structural issues in the officer cadre.
- RBI employees staged protests in Mumbai and other regional offices, highlighting dissatisfaction with the new system. The issue reflects broader challenges related to human resource management in regulatory institutions.
- The RBI management has indicated willingness to engage with employees and address concerns through dialogue. This demonstrates the importance of institutional consultation in maintaining administrative efficiency and morale.

Reserve Bank of India

- **Constitutional and Legal Basis:** The RBI was established under the Reserve Bank of India Act and began operations in 1935. It serves as India's central bank responsible for monetary stability and financial regulation.
- **Core Functions:** RBI manages monetary policy, regulates banks, issues currency, and maintains financial stability. It also acts as banker to the government and lender of last resort.

- **Institutional Importance:** As the apex monetary authority, RBI plays a crucial role in economic governance and policy implementation. Its efficiency depends significantly on institutional autonomy and professional human resources.

- **Human Resource Structure:** RBI recruit's officers mainly through Grade B examinations and internal promotions. Career progression and staff morale are essential for maintaining institutional expertise and continuity.

Promotion Policies in Public Institutions

- **Time-Bound Promotion System:** Under this system, employees receive promotions after completing a specified number of years of service. It ensures predictable career progression and reduces uncertainty among employees.
- **Vacancy-Based Promotion System:** Promotions depend on the availability of higher posts within the organisational hierarchy. This system aims to maintain administrative balance but may lead to stagnation if vacancies are limited.
- **Administrative Rationale:** Institutions often shift to vacancy-based systems to rationalise workforce structures and control expenditure. However, such transitions require proper manpower planning and employee consultation.
- **Governance Concerns:** Sudden policy changes without broad consensus can reduce institutional trust and employee motivation. This may eventually impact organisational efficiency and productivity.

Issue of Career Stagnation in RBI

- **Limited Higher-Level Vacancies:** According to employee concerns, the number of officers at Grade C is much higher than available Grade D posts. This creates bottlenecks in career progression and increases competition within the same batch.
- **Long Waiting Periods:** Officers may remain in the same grade for more than a decade under the revised policy. Extended stagnation can adversely affect professional growth and morale.
- **Manpower Planning Deficit:** RBI officers have pointed to the absence of long-term workforce planning. Without systematic forecasting, promotional imbalances are likely to persist.
- **Institutional Impact:** Reduced employee satisfaction may affect policy implementation and internal administrative efficiency. Strong institutions require motivated personnel and transparent career pathways.

Public Sector Human Resource Management Challenges

- **Balancing Efficiency and Fairness:** Public institutions must maintain efficiency while ensuring fair treatment of employees. Transparent promotion systems are essential for institutional credibility.
- **Need for Consultation:** Employee associations play an important role in participatory governance. Consultative decision-making helps reduce conflict and improve acceptance of reforms.

- **Professional Motivation:** Career growth opportunities are important for attracting and retaining skilled professionals. This is especially critical in specialised institutions like RBI.
- **Changing Administrative Needs:** Regulatory institutions increasingly require specialised expertise in technology, finance, and risk management. Human resource policies must evolve to meet these emerging requirements.

Institutional Autonomy and Accountability

- **Autonomous Functioning:** RBI operates with a significant degree of operational autonomy in monetary and regulatory matters. Internal administrative decisions are part of institutional governance mechanisms.
- **Need for Accountability:** Even autonomous institutions must maintain transparency and fairness in personnel management. This helps sustain employee trust and institutional legitimacy.
- **Role of Leadership:** Constructive engagement between management and employees is essential during policy transitions. Dialogue-based resolution mechanisms strengthen institutional stability.
- **Broader Governance Lesson:** Human resource reforms should balance organisational efficiency with employee welfare considerations. This reflects the principles of good governance and administrative ethics.

Comparative Perspective: Promotions in Public Services

- **Civil Services Structure:** Many government services in India combine seniority, merit, and vacancy considerations in promotions. This hybrid model attempts to maintain both efficiency and fairness.
- **Central Pay Commission Recommendations:** Successive Pay Commissions have emphasised career progression and reduction of stagnation. They have recommended periodic cadre restructuring and transparent appraisal systems.
- **Global Practices:** Central banks in advanced economies focus heavily on skill-based progression and continuous professional development. Institutional capacity building is treated as a strategic priority.
- **Need for Reform:** India's public institutions increasingly require modern HR frameworks balancing accountability, expertise, and employee satisfaction. This is critical for improving governance outcomes.

Way Forward

- **Comprehensive HR Review:** RBI should undertake long-term manpower planning and cadre restructuring. This can help reduce bottlenecks and ensure smoother career progression.
- **Consultative Reform Process:** Employee associations should be actively involved in policy formulation. Participatory governance improves policy acceptance and implementation.
- **Balanced Promotion Framework:** A hybrid system combining merit, experience, and time-bound progression may be more effective. It can balance organisational needs with employee aspirations.

- **Capacity Building:** RBI should invest in training, leadership development, and specialised skill enhancement. This will strengthen institutional professionalism and future readiness.

Conclusion

The RBI promotion policy controversy highlights the broader challenge of balancing administrative efficiency with employee welfare in public institutions. Transparent governance, participatory decision-making, and long-term human resource planning are essential for maintaining institutional credibility and operational effectiveness in India's premier financial regulator.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. "Human resource reforms in public institutions must balance organisational efficiency with employee welfare." Discuss in the context of recent debates surrounding the Reserve Bank of India's promotion policy. (250 words, 15 marks)

Mission for Cotton Productivity

Why in News: The Union Cabinet has approved a ₹5,659 crore "Mission for Cotton Productivity" for 2026–31 to enhance cotton yield, quality, and farmer income while strengthening India's textile value chain and global competitiveness.

Key Details

- The mission aims to address India's **stagnant cotton productivity** through improved seeds, mechanisation, and climate-resilient farming practices. It is designed to bridge the yield gap between India and global leaders like Brazil and the USA.
- It focuses on enhancing **cotton quality and reducing contamination levels** to improve export competitiveness. This is critical because Indian cotton often suffers from high trash content due to manual harvesting practices.
- The scheme promotes **end-to-end value chain integration** from farm production to textile manufacturing. This aligns with India's goal of strengthening its position in the global textile and apparel market.
- It is jointly implemented by the **Ministry of Agriculture and Farmers Welfare** and the **Ministry of Textiles**. It also involves ICAR and CSIR institutions for research and innovation support.

Mission for Cotton Productivity

- **Objective:** Improve cotton productivity, fibre quality, and farmer income through science-based interventions. The mission targets long-term structural reforms rather than short-term yield support.
- **Coverage:** Initially focuses on **140 districts across 14 cotton-growing states**. This ensures targeted intervention in high-production but low-yield regions.
- **Technology Focus:** Emphasis on **High-Yielding Varieties (HYVs), Extra Long Staple (ELS) cotton, and biotechnology tools**. These innovations aim to improve fibre strength, length, and pest resistance.

- **5F Vision Alignment:** Supports “Farm to Fibre to Factory to Fashion to Foreign” framework. This strengthens India’s integrated textile ecosystem from agriculture to exports.

Cotton in India

- Cotton is known as “**White Gold**” due to its high economic value in agriculture and industry. It is a key commercial crop supporting India’s textile and export sectors.
- India is the **largest cotton-growing country by area and second-largest producer globally**. However, productivity remains lower than global averages due to structural constraints.
- Cotton is mainly grown in **Maharashtra, Gujarat, Telangana, and Karnataka**. These states form the core of India’s cotton belt across central and southern regions.
- It thrives in **black soil (regur soil)** and warm climatic conditions. However, it is highly sensitive to water stress and pest attacks.

Need for Mission for Cotton Productivity

- **Low Productivity:** India’s yield (~440 kg/ha) is significantly lower than global leaders (~700–800 kg/ha). This reflects inefficiencies in seeds, irrigation, and farm practices.
- **Pest Infestation:** **Pink Bollworm and Whitefly** have severely impacted cotton output. Pest resistance to Bt cotton has further reduced effectiveness of earlier gains.
- **Climate Vulnerability:** Nearly two-thirds of cotton cultivation is rainfed. This makes production highly sensitive to monsoon variability and drought conditions.

- **Import Dependence:** India imports Extra Long Staple cotton for premium textile production. This weakens domestic value addition in high-end textile markets.

Challenges in Cotton Cultivation

- **Fragmented Landholdings:** Majority farmers own less than 2 hectares of land. This limits adoption of mechanisation and modern farming systems.
- **Soil Degradation:** Continuous monocropping has reduced soil fertility. This increases dependency on chemical inputs, raising production costs.
- **Biotech Resistance:** Pests have developed resistance to existing Bt cotton varieties. This reduces effectiveness of genetically modified crop solutions.
- **Labour Constraints:** Cotton picking is labour-intensive and increasingly expensive. This creates pressure for mechanised harvesting solutions.

Technology and Innovation in Cotton Sector

- **High-Density Planting System (HDPS):** Enables higher yield per hectare through closer spacing. It requires efficient irrigation and nutrient management systems.
- **Bt Cotton Technology:** Provides resistance against bollworms. However, its long-term effectiveness is declining due to pest adaptation.
- **Biotechnology & Breeding:** Focus on developing climate-resilient and pest-resistant cotton varieties. This includes research on Extra Long Staple (ELS) cotton varieties.
- **Digital Agriculture Tools:** Use of AI, satellite data, and mobile advisories. These tools help in pest detection, irrigation scheduling, and yield prediction.

GROWING CONDITIONS

Climate

It thrives in hot, sunny climates with long frost-free periods (210 days) and requires high temperatures, light rainfall or irrigation, and bright sunshine.

Soil Types

It grows well in Deccan plateau’s black cotton soil, deep alluvial soils in northern India, black clayey soils in central regions, and mixed black and red soils in the southern zone.

Sensitivity

While cotton can tolerate some salinity, it is highly vulnerable to waterlogging.

Growth Cycle

As a Kharif crop, cotton requires 6 to 8 months to mature.

India’s Cotton Production

COTTON PRODUCTION in lakh bales

COTTON LINT YIELD in kg/hectare

Cotton Cultivation

India got **1st** place in the world in cotton acreage with **130.61** lakh hectares area under cotton cultivation i.e. around **40%** of the world area of **324.16** lakh hectares.

India is the only country which grows all four species of cotton

G. Arboreum and
G. Herbaceum
(Asian cotton)

G. Barbadense
(Egyptian cotton)

G. Hirsutum
(American Upland cotton)

Major 9 cotton growing states divided according to Agro-Ecological zones

- Northern Zone
- Central Zone
- Southern Zone

India's Supporting Initiatives for Cotton Sector

- **National Food Security Mission – Cotton Component:** This promotes productivity enhancement through improved seed distribution.
- **National Technical Textiles Mission:** This supports value addition and industrial use of cotton in technical textiles.
- **Cotton Corporation of India (CCI):** Ensures MSP operations and stabilises cotton prices for farmers.
- **Kasturi Cotton Bharat Initiative:** Aims to brand Indian cotton globally with traceability and quality certification.

Major Issues in Mission Implementation

- **Climate Dependency:** HDPS and HYVs require stable irrigation support. Without irrigation, yield gains may not be sustained.
- **Adoption Barriers:** Small farmers face difficulty adopting mechanised and advanced systems. High input costs discourage rapid transition.
- **Pest Evolution:** Continuous evolution of pest resistance threatens seed-based solutions. This requires integrated pest management strategies.
- **Processing Gaps:** Lack of modern ginning and storage infrastructure reduces quality. This affects India's global competitiveness in textiles.

Way Forward

- **Strengthening Extension Services:** Krishi Vigyan Kendras (KVKs) must ensure last-mile awareness. Farmers need continuous training on modern practices.
- **Micro-Irrigation Expansion:** Integration with PMKSY can stabilise cotton productivity. Water efficiency is critical for rainfed cotton regions.
- **Integrated Pest Management (IPM):** Combination of biological, chemical, and cultural control methods. This reduces pesticide dependence and improves sustainability.

Key Highlights at a Glance

Unemployment Rate: 3.1% | **LFPR:** 59.3% | **WPR:** 57.4% | **Youth NEET:** 25.0% | **Formal Vocational Training:** only 4.2%

Agriculture employment fell to 43.0%; **Manufacturing** rose to 12.1%; **Services** at 13.1%

- **Mechanisation Support:** Promotion of custom hiring centres for small farmers. This ensures access to expensive harvesting machinery.

Conclusion

The Mission for Cotton Productivity represents a structural reform in India's cotton economy, focusing on science, sustainability, and value addition. If implemented effectively, it can transform India from a high-volume producer to a high-value global leader in cotton and textiles.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. "India's cotton sector suffers from high production but low productivity." Discuss the role of the Mission for Cotton Productivity in addressing this challenge. Also examine the technological and institutional reforms required for its success." (250 words, 15 marks)

Periodic Labour Force Survey (PLFS) 2025

Why in News: The **Annual Report of the Periodic Labour Force Survey (PLFS) 2025**, released by the **National Statistical Office (NSO)** under the Ministry of Statistics and Programme Implementation (MoSPI), reveals a broadly stable labour market with:

- Labour Force Participation Rate (LFPR) at 59.3%
- Unemployment Rate declining marginally to 3.1%

This is the **first comprehensive report based on the Calendar Year (January–December 2025)** as the survey period, a significant methodological upgrade from the earlier July–June fiscal year framework.

Key Findings of PLFS 2025

- **Stable Participation Rates**
 - LFPR for persons aged 15+ remained stable at 59.3%.
 - Significant gender gap persists: Male LFPR at 79.1% vs Female LFPR at 40.0%.
- **Worker Population Ratio (WPR)**
 - WPR reached 57.4%, indicating approximately 61.6 crore Indians are currently employed.
 - Of these, 41.6 crore are males and 20.0 crore are females.
- **Youth NEET — A Demographic Dividend at Risk**
 - Approximately 25.0% of youth (15–29 years) fall into the NEET (Not in Employment, Education or Training) category.
 - This signals a massive underutilisation of India's demographic dividend.
- **Shift Towards Formalisation**
 - Self-employment declined to 56.2%.
 - Regular wage/salaried employment rose to 23.6%, signalling a modest but positive structural shift toward formal work.
- **Youth and Urban Unemployment**
 - Youth Unemployment Rate (15–29 years) improved to 9.9%.

- Urban youth still face a significantly higher unemployment rate of 13.6% vs 8.3% in rural areas.
- **Sectoral Realignment**
 - Agriculture declined to 43.0% of employment share.
 - Manufacturing (12.1%) and Services (13.1%) witnessed enhanced worker participation — a sign of structural transformation.
- **Rising Female Earnings**
 - Nominal earnings for females grew faster than males.
 - Female self-employment earnings rose by 8.8%; regular salaried earnings by 7.2%.
- **Barriers to Female Labour Force Participation**
 - 44.4% of females cited child care and home-making commitments as the primary reason for remaining outside the labour force.
 - For males, 69.8% cited continuing education as the primary reason.
- **Vocational Training and Education Attainment**
 - Only 4.2% of the workforce (15–59 years) has received formal vocational or technical training — a critical skill deficit.
 - 67.8% of persons aged 15+ have attained at least secondary level education.
 - Average formal education duration: 10.0 years.

Key Statistical Summary PLFS 2025

Indicator	Value (2025)
Labour Force Participation Rate (LFPR)	59.3%
Worker Population Ratio (WPR)	57.4%
Unemployment Rate (UR)	3.1%
Total Employed Persons	~61.6 crore
Male LFPR	79.1%
Female LFPR	40.0%
Youth Unemployment Rate (15–29 yrs)	9.9%
Urban Youth Unemployment	13.6%
Rural Youth Unemployment	8.3%
Youth NEET Rate (15–29 yrs)	25.0%
Share of Self-Employed Workers	56.2%
Share of Regular Wage/Salaried Workers	23.6%

Employment in Agriculture	43.0%
Employment in Manufacturing	12.1%
Employment in Services	13.1%
Workers with Formal Vocational Training	4.2%
Population with Secondary Education (15+)	67.8%
Avg. Formal Education Duration	10.0 years

What is the Periodic Labour Force Survey (PLFS)?

About: PLFS is India's official framework for tracking employment and unemployment dynamics, launched in April 2017 by the NSO under MoSPI.

Core Objectives:

- **Monthly & Quarterly Estimates (Rural + Urban):** Since January 2025, the survey provides monthly all-India estimates and quarterly bulletins for both rural and urban areas, tracking short-term labour market fluctuations using the Current Weekly Status (CWS). Earlier, quarterly data was only for urban areas.
- **Annual Estimates:** Comprehensive yearly report based on the Calendar Year (January–December), covering both rural and urban sectors to capture structural shifts.

Key Indicators Measured:

Indicator	Formula	PLFS 2025
LFPR	$[(\text{Employed} + \text{Unemployed}) / \text{Total Population}] \times 100$	59.3%
WPR	$(\text{Employed Persons} / \text{Total Population}) \times 100$	57.4%
UR	$[\text{Unemployed} / (\text{Employed} + \text{Unemployed})] \times 100$	3.1%

Classification of Activity Status:

- **Usual Status (PS+SS):** Based on activity during the last 365 days. Captures long-term, stable employment trends. Combines Principal Status (PS) and Subsidiary Status (SS).
- **Current Weekly Status (CWS):** Based on activity during the last 7 days. A person is 'employed' if they worked for at least one hour on any day during the reference week. Primary metric for monthly and quarterly reports.

Steps Needed to Address Challenges Highlighted by PLFS 2025

- **Bridging the Gender Gap in Labour Force Participation**
 - Invest in affordable community creches and elderly care centres to reduce the 'double burden' on women.

- Promote 'Work from Home' and Hybrid models in the formal salaried sector to prevent female dropout from the workforce.
- **Apprenticeship-Linked Education**
 - Standardise degree programmes where the final year involves a mandatory paid industry apprenticeship.
 - Focus on green jobs and municipal services to absorb the high volume of unemployed urban youth (13.6%).
- **Vocational Training and Skill Alignment**
 - Create vocational centres targeting the growing Manufacturing (12.1%) and Services (13.1%) sectors.
 - Provide self-employed youth with digital marketing and financial management skills to transition from subsistence to entrepreneurial self-employment.
- **Formalisation Incentives**
 - Provide tax incentives to MSMEs that convert workers from casual/contractual to regular salaried employment with social security (PF/ESI).
 - Improve ease of doing business in labour-intensive sectors such as textiles and electronics assembly to capitalise on the rise in manufacturing participation.
- **Improve Rural Labour Quality and Earnings**
 - Establish Integrated Agro-Processing Clusters to shift rural labour from low-yield subsistence farming to high-value food processing (sorting, grading, packaging).
 - Bridge the rural-urban earnings gap through Agro-Industrialisation and year-round stable income creation.
- **Regional and Sectoral Parity**
 - Mitigate uneven employment opportunities by investing in local infrastructure, industrial clusters, skill hubs, and mobility support.
 - Connect labour with emerging job opportunities in Tier-2 and Tier-3 cities to reduce concentration of unemployment in urban metros.

Conclusion

The PLFS 2025 presents a picture of a **resilient but structurally challenged** Indian labour market. While the decline in unemployment rate to 3.1% and rising female earnings signal positive momentum, the persistence of a **25% NEET rate among youth**, a stark **gender gap of 39.1 percentage points** in LFPR, and only **4.2% formal vocational training** coverage reveal deep structural vulnerabilities. Policy imperatives must focus on female workforce inclusion, quality skill development aligned with

the manufacturing and services sectors, and the creation of formal, sustainable employment to fully harness India's demographic dividend.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. With reference to the Periodic Labour Force Survey (PLFS) 2025, consider the following statements:

1. The Labour Force Participation Rate (LFPR) for persons aged 15+ in 2025 stood at 59.3%.
2. The Current Weekly Status (CWS) classifies a person as employed if they worked for at least one hour on any day during the reference week.
3. As per PLFS 2025, agriculture accounts for less than 40% of total employment in 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

Answer: (a)

Descriptive Question

Q. "Despite declining unemployment, India's labour market continues to face structural challenges of informalisation, gender exclusion, and skill deficit." Critically examine with reference to the findings of PLFS 2025. (250 words, 15 marks)

Coal Gasification Scheme 2026

Why in News: The Union Cabinet has approved the **Scheme for Promotion of Surface Coal/Lignite Gasification Projects** with a financial outlay of **₹37,500 crore**. The scheme aims to accelerate India's target of **gasifying 100 Million Tonnes (MT) of coal by 2030**, strengthen energy security, reduce import dependence, and promote value addition from domestic coal resources.

Key Details

- The Cabinet has approved a **₹37,500 crore incentive scheme** for surface coal and lignite gasification projects.
- The scheme is expected to support the gasification of approximately **75 MT of coal/lignite** and promote domestic production of syngas and downstream products.
- Financial incentives will be provided up to **20% of plant and machinery cost**. The support will be disbursed through a transparent competitive bidding mechanism linked to project milestones.
- The government has extended the **coal linkage tenure to 30 years** under the Non-Regulated Sector framework.
- This provides long-term policy certainty and encourages large-scale private investment in coal gasification projects.
- The initiative is expected to mobilise investments worth **₹2.5–3 lakh crore**. It is projected to create around **50,000 direct and indirect jobs**, especially in coal-bearing regions.

Coal Gasification: Understanding the Basics

What is Coal Gasification?

- Coal gasification is a process in which coal or lignite is converted into **Synthesis Gas (Syngas)** through controlled reaction with oxygen, steam, and heat.
- Unlike direct burning, gasification converts solid fuel into a cleaner gaseous form that can be used for multiple industrial purposes.
- Syngas mainly contains **carbon monoxide (CO), hydrogen (H₂), and small amounts of carbon dioxide (CO₂)**.
- It serves as an important feedstock for producing chemicals, fertilizers, fuels, and industrial products.

What is Syngas?

- Syngas is a versatile intermediate product used in the manufacture of **methanol, ammonia, urea, synthetic natural gas (SNG), hydrogen, and various petrochemicals**.
- It reduces dependence on imported raw materials and supports domestic manufacturing.
- Countries such as **China and South Africa** have extensively used coal gasification technologies to convert domestic coal resources into value-added products.
- Their experience demonstrates the strategic importance of gasification in resource-rich economies.

India's Coal Sector

Coal Reserves

- India possesses approximately **401 billion tonnes of coal reserves**, making it one of the world's largest coal reserve holders.
- These reserves provide a strong foundation for energy security and industrial development.
- India also possesses around **47 billion tonnes of lignite reserves**.
- Lignite can also be gasified and used for producing valuable industrial products.

Role in Energy Mix

- Coal contributes more than **55% of India's primary energy requirements**.
- Despite rapid renewable energy expansion, coal continues to remain a critical component of India's energy transition.
- Thermal power plants account for the majority of India's electricity generation.
- Therefore, improving the efficiency and value addition of coal remains strategically important.

National Coal Gasification Mission

Background

- The Government launched the **National Coal Gasification Mission in 2021** to promote cleaner and more efficient utilisation of coal resources.
- The mission seeks to reduce imports while creating new industrial value chains.
- In January 2024, the government approved a separate **₹8,500 crore coal gasification support scheme**.
- Under that scheme, eight projects worth more than ₹6,200 crore are currently under implementation.

Target

- India has set a target of **100 MT coal gasification by 2030**.
- The newly approved scheme is expected to substantially contribute toward achieving this target.

Strategic Importance for India

Energy Security

- India imports a significant proportion of its requirements for LNG, ammonia, methanol, and other industrial feedstocks. Domestic coal gasification can reduce vulnerability arising from global supply disruptions.
- The ongoing geopolitical uncertainties in **West Asia** have highlighted the risks associated with excessive import dependence.
- Coal gasification can provide a reliable domestic alternative for critical industrial inputs.

Import Substitution

Current Import Dependence

- India imports more than **50% of its LNG requirements**. This exposes the economy to global energy price volatility.
- Around **20% of urea demand**, nearly **100% of ammonia demand**, and **80–90% of methanol demand** is met through imports.
- Coal gasification can significantly reduce this import burden over time.

Economic Benefits

- India's import bill for substitutable products such as LNG, ammonia, methanol, ammonium nitrate, and coking coal stood at approximately **₹2.77 lakh crore in FY 2025**.
- Reducing imports would strengthen the current account balance and improve economic resilience.

Contribution to Atmanirbhar Bharat

- Coal gasification supports the vision of **Atmanirbhar Bharat** by creating domestic supply chains for strategic industrial products.
 - It enhances self-reliance in chemicals, fertilizers, and energy sectors.
- The scheme complements the objectives of **Make in India** by promoting domestic manufacturing and industrial investment.
 - It can create downstream industries around gasification hubs.

Employment Generation and Regional Development

- The scheme is expected to create approximately **50,000 jobs**, both direct and indirect. Most of these opportunities are likely to emerge in coal-bearing states such as Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh, and West Bengal.
- Industrial development around coal-producing regions can improve local infrastructure and economic activity. It can also contribute to balanced regional development.

Technology and Innovation Ecosystem

- The scheme adopts a **technology-agnostic approach**, allowing different technological pathways to compete. This encourages innovation and operational efficiency.
- Special emphasis has been placed on promoting **indigenous technologies**. Developing domestic

expertise can reduce dependence on foreign engineering and technology providers.

Environmental Concerns and Challenges

Carbon Emissions

- Coal gasification is cleaner than direct coal combustion for several industrial applications.
- However, it still remains a carbon-intensive process and requires proper emission management.

Water Requirement

- **Gasification** projects require substantial quantities of water. This may pose challenges in water-stressed regions.

Economic Viability

- High capital costs and technological complexity remain important concerns.
- Long-term policy support and market certainty are essential for project success.

Climate Commitments

- India must balance energy security objectives with its commitments under the **Paris Agreement** and its long-term net-zero aspirations.
- Future integration with carbon capture technologies may become necessary.

Way Forward

- Accelerate commercial deployment of indigenous gasification technologies.
- Integrate coal gasification with green hydrogen and carbon capture initiatives.
- Strengthen environmental safeguards and water-use efficiency.
- Promote public-private partnerships for technology development and investment mobilisation.
- Ensure alignment between energy security objectives and climate commitments.

Conclusion

The **₹37,500 crore Coal/Lignite Gasification Scheme** represents a significant step towards strengthening India's energy security, reducing import dependence, and creating value from abundant domestic coal resources. While economic and strategic benefits are substantial, long-term success will depend on technological innovation, environmental sustainability, and effective implementation. The initiative has the potential to become a key pillar of India's journey towards **Atmanirbhar Bharat** and resilient industrial growth.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to Coal Gasification, consider the following statements:

1. Coal gasification converts coal into synthesis gas containing hydrogen and carbon monoxide.
2. Syngas can be used for producing methanol, ammonia, and synthetic natural gas.
3. Coal gasification completely eliminates carbon emissions and is a zero-carbon technology.

How many of the above statements are incorrect?

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

Answer: a (3 only)

Descriptive Question

Q. "Coal gasification is emerging as a critical component of India's energy security and import substitution strategy. Discuss its potential benefits, challenges, and relevance in achieving Atmanirbhar Bharat." (250 words, 15 marks)

RBI's Intervention to Defend the Rupee

Why in News: The Indian Rupee (INR) depreciated sharply in May 2026, approaching a historic low of ₹97 per US Dollar amid global uncertainties, rising crude oil prices, and geopolitical tensions in West Asia. To stabilise the currency, the Reserve Bank of India adopted a combination of foreign exchange interventions, liquidity management measures, and capital flow strategies.

Key Details

- The RBI reportedly sold around **USD 1 billion daily in the spot foreign exchange market** to meet excess dollar demand and reduce volatility.
- This intervention aimed to prevent panic-driven depreciation and ensure orderly functioning of the foreign exchange market.
- The central bank announced a **USD 5 billion USD/INR buy-sell swap auction** to manage both rupee liquidity and foreign exchange availability.
- This helped provide liquidity support to banks while reducing pressure on the domestic currency.
- The depreciation was influenced by factors such as rising crude oil import bills, capital outflows, and global risk aversion.
- As India imports over 85% of its crude oil requirement, higher oil prices directly increase demand for US dollars.
- The episode highlights the importance of foreign exchange reserves, prudent monetary policy, and macroeconomic stability.
- It also demonstrates the RBI's role in maintaining confidence in the Indian financial system.

Understanding Currency Depreciation

- **Currency Depreciation:** It refers to a decline in the value of a currency relative to another currency under a market-determined exchange rate system. For example, if the exchange rate moves from ₹83 per USD to ₹97 per USD, the rupee has depreciated against the dollar.
- **Managed Float Regime:** India follows a managed floating exchange rate system where market forces determine the exchange rate. However, the RBI intervenes occasionally to prevent excessive volatility and speculative attacks.
- **Demand and Supply Dynamics:** The value of the rupee depends on the demand and supply of foreign currency in the market. Higher imports, capital outflows, or

geopolitical uncertainties increase demand for dollars and weaken the rupee.

- **Difference Between Depreciation and Devaluation:** Depreciation occurs due to market forces, whereas devaluation is an official reduction in currency value by the government or central bank. UPSC frequently asks conceptual questions based on this distinction.

Foreign Exchange Reserves: India's First Line of Defence

- **What are Forex Reserves:** Foreign exchange reserves consist of foreign currencies, gold reserves, Special Drawing Rights (SDRs), and reserve assets held with the IMF. They act as a buffer against external shocks and help maintain confidence in the economy.
- **Role in Currency Stability:** The RBI uses forex reserves to sell dollars during periods of excessive depreciation. This increases dollar supply in the market and helps stabilise the rupee.
- **Macroeconomic Importance:** Adequate reserves improve a country's ability to meet import obligations and external debt commitments. They also enhance investor confidence during global uncertainties.
- **India's Strategic Advantage:** India currently possesses one of the world's largest foreign exchange reserve holdings. This provides significant flexibility to manage temporary external sector pressures.

Spot Market Intervention by RBI

- **Direct Dollar Sales:** The RBI sells US dollars in the spot market from its forex reserves. This immediately increases dollar availability and addresses excess demand from importers and investors.
- **Containing Volatility:** The objective is not to target a specific exchange rate but to prevent disorderly market movements. A stable currency environment supports trade, investment, and financial stability.
- **Impact on Liquidity:** Selling dollars withdraws rupees from the banking system. If not managed carefully, this can tighten liquidity and increase borrowing costs.
- **Short-Term Measure:** Spot interventions provide immediate relief but cannot permanently counter structural economic pressures. Long-term stability depends on economic fundamentals.

Sterilised Intervention and Open Market Operations

- **Meaning of Sterilised Intervention:** When the RBI sells dollars and absorbs rupees, it simultaneously injects rupee liquidity through other instruments. This ensures that currency intervention does not disrupt domestic money markets.
- **Role of Open Market Operations (OMOs):** The RBI purchases government securities from the market. This injects liquidity into the banking system and offsets the liquidity drain caused by forex intervention.
- **Balancing Objectives:** Sterilised interventions allow the RBI to stabilise the exchange rate without affecting

domestic interest rates significantly. They are widely used by central banks across the world.

- **Importance for Growth:** Maintaining adequate liquidity supports credit growth and economic activity. This helps avoid unintended tightening of financial conditions.

Forex Swap Auctions: An Advanced RBI Tool

- **Concept of Forex Swaps:** A forex swap involves simultaneous purchase and sale of foreign currency with an agreement to reverse the transaction later. It helps manage both foreign exchange reserves and domestic liquidity efficiently.
- **Buy-Sell Swap:** The RBI purchases dollars from banks and provides rupees immediately. This increases liquidity in the banking system while maintaining future forex flexibility.
- **Sell-Buy Swap:** The RBI sells dollars and absorbs rupees from banks. This tool is useful when excess liquidity needs to be withdrawn from the market.
- **May 2026 Swap Auction:** The RBI announced a **USD 5 billion swap auction** amid rupee weakness. This demonstrated the increasing use of market-based liquidity management instruments.

Monetary Policy and Exchange Rate Stability

- **Repo Rate as a Defence Tool:** Higher repo rates increase returns on Indian financial assets. This attracts foreign investment and supports the rupee through higher capital inflows.
- **Role of the Monetary Policy Committee (MPC):** The MPC determines policy rates based on inflation and growth considerations. Exchange rate developments indirectly influence policy decisions.
- **Interest Rate Differential:** Investors compare returns available in India with those in advanced economies such as the United States. A favourable differential can encourage foreign capital inflows.
- **Limitations:** Excessively high interest rates may slow economic growth and investment. Hence, monetary policy must balance multiple objectives.

Managing Speculative Attacks on the Rupee

- **Speculative Pressure:** Traders may bet on further rupee depreciation by borrowing rupees and purchasing dollars. This can amplify currency volatility beyond economic fundamentals.
- **Liquidity Adjustment Facility (LAF):** The RBI can tighten liquidity conditions temporarily. Higher short-term borrowing costs make speculative trades more expensive.
- **Pre-Market Intervention:** The RBI sometimes intervenes before regular market trading begins. This can influence market sentiment and reduce panic-driven selling.
- **Psychological Impact:** Managing expectations is often as important as managing actual liquidity. Credible intervention can discourage speculative behaviour.

Capital Flow Management Measures

- **External Commercial Borrowings (ECBs):** The RBI may relax ECB norms to enable Indian firms to raise more

foreign capital. This increases foreign currency inflows into the economy.

- **Foreign Portfolio Investment (FPI):** Easing investment limits for FPIs encourages overseas investors to invest in Indian debt markets. This supports the balance of payments position.
- **Masala Bonds:** These are rupee-denominated bonds issued overseas by Indian entities. The foreign investor bears exchange rate risk, reducing pressure on domestic borrowers.
- **Net Open Position (NOP) Limits:** Restrictions on banks' foreign currency exposure reduce speculative activity. This helps maintain orderly market conditions.

Special Dollar Window for Oil Marketing Companies

- **Why OMCs Matter:** Companies such as Indian Oil Corporation and Bharat Petroleum Corporation Limited are among the largest buyers of dollars in India. Their import requirements can create sudden demand spikes in forex markets.
- **Special Dollar Window:** The RBI can provide dedicated access to foreign currency for these companies. This prevents excessive pressure on the open market.
- **Historical Significance:** Such measures were used effectively during the 2013 currency crisis. They helped stabilise the rupee during periods of intense market stress.
- **Strategic Importance:** Ensuring uninterrupted energy imports is critical for economic stability. Therefore, managing OMC dollar demand has macroeconomic significance.

Lessons from Past Currency Crises

- **1998 Resurgent India Bonds (RIBs):** India mobilised overseas Indian savings to strengthen foreign exchange reserves. The initiative successfully raised billions of dollars during a period of external pressure.
- **2013 Taper Tantrum:** Global capital outflows severely affected emerging markets, including India. The RBI responded through FCNR(B) deposit schemes and other measures.
- **Importance of NRI Capital:** Non-Resident Indians have historically contributed significantly during balance of payments pressures. Their deposits and investments provide an additional source of stability.
- **Policy Learning:** Past experiences have strengthened India's crisis management framework. Today, the RBI possesses a wider range of instruments than in previous decades.

Challenges and Concerns

- **Imported Inflation:** A weaker rupee makes imports such as crude oil, fertilisers, and electronics more expensive. This can increase inflationary pressures across the economy.
- **External Debt Burden:** Currency depreciation increases repayment costs for borrowers with foreign currency liabilities. This affects both corporates and government finances indirectly.

- **Investor Sentiment:** Persistent depreciation can reduce investor confidence if not managed effectively. It may lead to additional capital outflows.
- **Global Uncertainties:** Geopolitical conflicts, oil price shocks, and monetary tightening in advanced economies remain key risks. These factors are often beyond domestic policy control.

Way Forward

- **Strengthen External Sector Resilience:** Continue building adequate forex reserves and diversify export markets. This will reduce vulnerability to global shocks.
- **Promote Stable Capital Inflows:** Encourage long-term FDI rather than relying excessively on volatile portfolio investments. Stable inflows provide sustainable support to the currency.
- **Enhance Export Competitiveness:** Improving manufacturing and services exports can strengthen foreign exchange earnings. This reduces dependence on external borrowing.
- **Maintain Macroeconomic Stability:** Fiscal discipline, inflation control, and financial sector stability remain essential. Strong economic fundamentals provide the best long-term support for the rupee.

Conclusion

The RBI's intervention strategy reflects a combination of foreign exchange management, monetary policy tools, liquidity operations, and capital flow measures. While short-term interventions can reduce excessive volatility, the long-term strength of the rupee ultimately depends on robust economic fundamentals, export competitiveness, controlled inflation, and sustained investor confidence.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the Reserve Bank of India's foreign exchange management operations, consider the following statements:

1. India follows a fully fixed exchange rate regime where the RBI determines the value of the rupee.
2. Sterilised intervention involves offsetting the liquidity impact of foreign exchange operations through domestic monetary measures.
3. Masala Bonds are rupee-denominated bonds issued overseas by Indian entities.

How many of the above statements are correct?

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

Answer: b (2&3 only)

Descriptive Question

Q. "The stability of a currency depends not only on central bank interventions but also on the strength of macroeconomic fundamentals." Examine in the context of the Reserve Bank of India's recent measures to defend the Indian Rupee. (250 words, 15 marks).

PM-WANI Gets Citizen-Friendly Upgrade

Why in News: The Department of Telecommunications has introduced a series of citizen-centric reforms under the **Prime Minister's Wi-Fi Access Network Interface (PM-WANI)** framework to make public Wi-Fi services simpler, safer, and more accessible across India.

Key Details

- The latest reforms focus on improving user experience through simplified access mechanisms and flexible internet plans. These measures are expected to promote wider adoption of public Wi-Fi services, particularly among students, commuters, travellers, and small businesses.
- New features include **QR-based authentication**, short-duration internet plans, and standardised hotspot names. The reforms aim to reduce barriers to internet access and strengthen India's digital connectivity ecosystem.
- The initiative supports the vision of **Digital India** by expanding affordable broadband access. It also contributes towards bridging the digital divide between urban and rural areas.
- Public Wi-Fi is increasingly being recognised as an important component of India's digital public infrastructure. It complements mobile broadband services and enhances last-mile internet connectivity.

PM-WANI: Concept and Objectives

- **About PM-WANI:** PM-WANI stands for **Prime Minister's Wi-Fi Access Network Interface**, launched in 2020 by the Department of Telecommunications. It seeks to create a nationwide network of public Wi-Fi hotspots to provide affordable internet access to citizens.
- **Core Objective:** The scheme aims to democratise internet access by enabling easy availability of broadband services in public places. This is particularly important for rural and underserved areas where broadband penetration remains limited.
- **Decentralised Model:** PM-WANI allows local shopkeepers, entrepreneurs, and small businesses to establish Wi-Fi hotspots without complex licensing requirements. This creates opportunities for digital entrepreneurship while expanding connectivity.
- **Digital Inclusion:** The initiative aligns with the goals of digital empowerment and inclusive development. It supports access to education, e-governance services, healthcare, and digital commerce.

QR-Based Authentication: Simplifying Internet Access

- **What is QR-Based Authentication?** Users can connect laptops or secondary devices by scanning a QR code through an authenticated smartphone application. This eliminates the need for repeatedly entering credentials and simplifies the login process.
- **Enhanced User Convenience:** The new system reduces the time required to access public Wi-Fi services. It

ensures a smoother and more user-friendly experience across multiple devices.

- **Improved Security:** Authentication through verified applications enhances network security and reduces misuse. It also minimises risks associated with unauthorised access to public networks.
- **Support for Multi-Device Usage:** Increasingly, citizens use multiple devices such as laptops, tablets, and smartphones simultaneously. QR-based authentication enables seamless connectivity across these devices.

Short-Duration Wi-Fi Plans

- **Sachet-Style Plans:** The reforms introduce flexible plans of **15, 30, and 60 minutes** duration. These plans are designed for users requiring internet access for short periods.
- **Citizen-Centric Design:** Students, commuters, tourists, professionals, and gig workers often need temporary internet access. Short-duration plans address this demand in a cost-effective manner.
- **Improved Accessibility:** Users no longer need to purchase long-term data packages for brief internet requirements. This increases affordability and promotes efficient resource utilisation.
- **Supporting Public Spaces:** Such plans are particularly useful at railway stations, airports, bus terminals, malls, and educational institutions. They strengthen digital connectivity in high-footfall locations.

Standardised PM-WANI Hotspot Names

- **Uniform Service Set Identifier (SSID):** Public Wi-Fi hotspots will use standardised PM-WANI branding. This enables users to easily identify genuine and authorised networks.
- **Building Trust:** Standardisation reduces confusion among users while connecting to public networks. It helps prevent accidental connection to fraudulent or insecure hotspots.
- **Promoting Adoption:** Clear branding increases visibility and awareness of PM-WANI services. This can encourage greater utilisation of public Wi-Fi infrastructure.
- **Strengthening Digital Infrastructure:** Standardisation contributes to a more organised and reliable public internet ecosystem. It improves the overall quality of digital service delivery.

PM-WANI and Digital India

- **Supporting Digital India:** PM-WANI complements flagship initiatives under the Digital India programme. It expands internet access and facilitates digital participation by citizens.
- **Boosting Digital Services:** Reliable internet connectivity is essential for accessing e-governance, digital payments, online education, and telemedicine. Public Wi-Fi can significantly enhance service delivery in these areas.
- **Bridging the Digital Divide:** Many citizens still lack affordable broadband access. Public Wi-Fi networks can reduce disparities between urban and rural populations.

- **Catalysing Digital Economy Growth:** Increased connectivity supports startups, MSMEs, e-commerce, and digital entrepreneurship. This contributes to economic growth and employment generation.

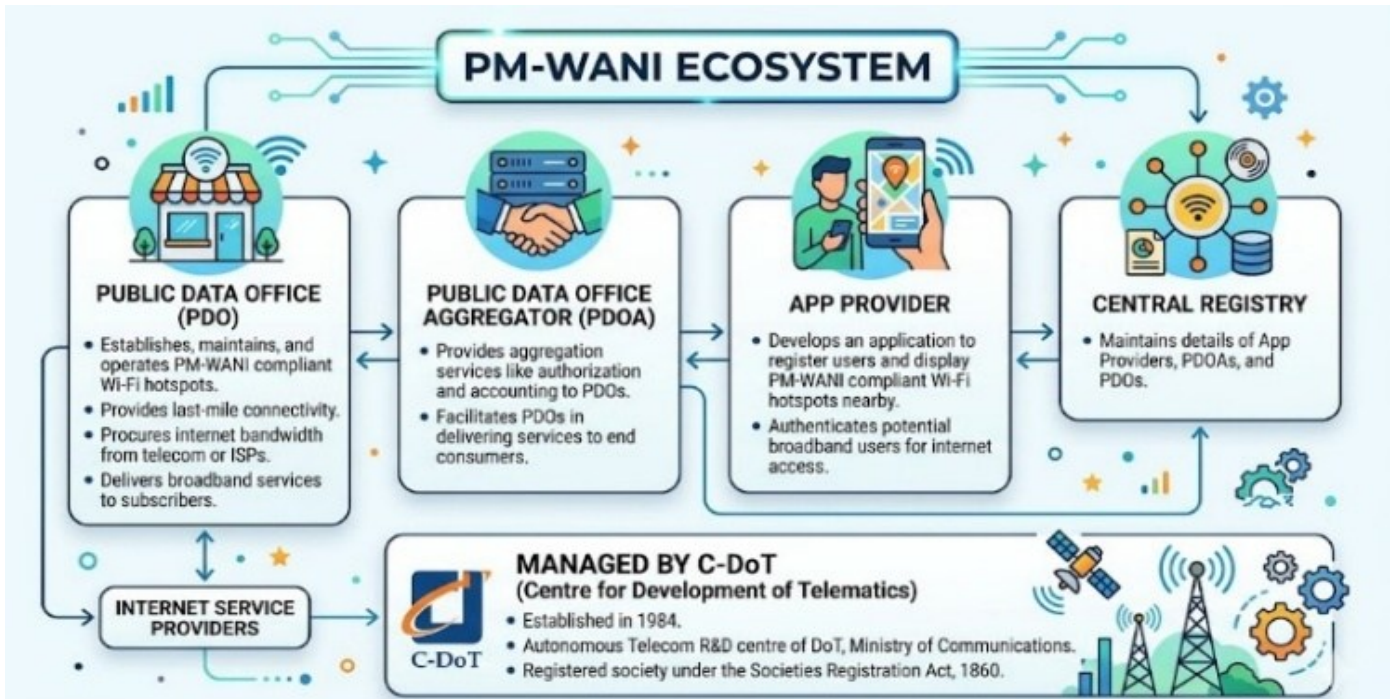
National Digital Communications Policy (NDCP), 2018

- **Policy Vision:** The **National Digital Communications Policy (NDCP), 2018** seeks to provide broadband access for all and create a digitally empowered society. PM-WANI is one of the initiatives supporting this broader policy objective.
- **Universal Broadband Connectivity:** The policy aims to ensure affordable and high-quality internet access across the country. Public Wi-Fi networks play a crucial role in achieving this goal.
- **Digital Infrastructure Development:** NDCP emphasises the creation of robust digital infrastructure as a core utility for every citizen. This is essential for India's transition towards a knowledge-based economy.

- **Economic Transformation:** Enhanced connectivity promotes innovation, investment, and digital inclusion. It supports India's ambition of becoming a leading digital economy.

Benefits of PM-WANI Reforms

- **Affordable Internet Access:** Public Wi-Fi offers low-cost internet services to citizens. This is particularly beneficial for economically weaker sections and students.
- **Ease of Access:** Simplified authentication and flexible plans improve user convenience. They reduce technical barriers to internet usage.
- **Local Entrepreneurship:** Small businesses can participate as Public Data Offices (PDOs). This generates additional income opportunities while expanding connectivity.
- **Enhanced Digital Participation:** Better internet access encourages citizens to engage with digital services and platforms. This strengthens digital inclusion and social empowerment.



Challenges and Concerns

- **Cybersecurity Risks:** Public Wi-Fi networks may be vulnerable to cyber threats if adequate safeguards are not implemented. Continuous monitoring and secure authentication mechanisms remain essential.
- **Infrastructure Gaps:** Rural and remote regions may still face connectivity and power infrastructure challenges. This could affect the effectiveness of PM-WANI implementation.
- **Awareness Deficit:** Many citizens remain unaware of the availability and benefits of public Wi-Fi services. Greater awareness campaigns are necessary for wider adoption.
- **Quality of Service:** Ensuring consistent speed and reliability across hotspots remains important. Poor user experience could discourage long-term utilisation.

Way Forward

- **Expand Rural Coverage:** Greater focus should be placed on deploying PM-WANI hotspots in underserved regions. This will help bridge the digital divide more effectively.
- **Strengthen Cybersecurity Measures:** Robust authentication and encryption standards must be maintained. This will enhance trust and protect user data.
- **Promote Awareness:** Digital literacy and awareness campaigns can increase public participation. Citizens should be informed about the benefits and usage of PM-WANI services.
- **Encourage Private Participation:** Collaboration with local businesses and technology providers can accelerate expansion. Public-private partnerships will improve sustainability and outreach.

Conclusion

The latest PM-WANI reforms represent an important step towards creating a more accessible, affordable, and citizen-friendly digital ecosystem. By simplifying internet access

through QR authentication, introducing flexible usage plans, and standardising public Wi-Fi networks, India is strengthening its digital public infrastructure and advancing the vision of inclusive digital connectivity.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the PM-WANI framework, consider the following statements:

1. PM-WANI was launched by the Department of Telecommunications in 2020 to expand public Wi-Fi access across India.
2. Under PM-WANI, only licensed telecom operators can establish public Wi-Fi hotspots.
3. The recent reforms introduced QR-based authentication and short-duration Wi-Fi plans.

How many of the above statements are correct?

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

Answer: (b)

Descriptive Question

Q. "Affordable and accessible internet connectivity is a critical component of digital inclusion and economic development." Discuss the significance of the PM-WANI framework in strengthening India's digital public infrastructure. (15 marks, 250 words).

Two New Special Economic Zones (SEZs) in Puducherry

Why in News: The Government of India has notified **two new Special Economic Zones (SEZs)** in the Union Territory of Puducherry. The proposals were approved by the Board of Approval under the Department of Commerce, marking a significant step towards export-led growth, employment generation, and regional industrial development.

Key Details

- The Government has approved **two new SEZs in Puducherry**, one focused on IT/ITES services and the other on multi-sector industrial development. These projects are expected to strengthen the Union Territory's role in India's export ecosystem and attract fresh investments.
- One SEZ is being developed by **Oulgaret Municipality**, making it the first SEZ in India to be developed by an Urban Local Body (ULB). This represents a new model of decentralized economic planning and local-level industrial development.
- The second SEZ is being developed by the **Pondicherry Industrial Promotion Development and Investment Corporation (PIPDIC)**. It aims to attract diversified manufacturing and service-sector industries to boost exports and employment.
- Together, these projects are expected to generate thousands of jobs and improve regional infrastructure.

They also support the government's objective of balanced regional development and industrial diversification.

Special Economic Zone Developed by an Urban Local Body

- **Location:** The IT/ITES SEZ is being established at Thattanchavady village in Oulgaret Taluk. The project covers approximately 8.62 hectares and represents a unique institutional innovation in India's SEZ framework.
- **Historic Significance:** This is the first SEZ in India to be developed by a municipal body. It demonstrates how local governments can actively participate in industrial and economic development.
- **Investment Potential:** The project involves a proposed investment of around ₹725 crore. This investment is expected to enhance digital infrastructure and attract technology-based enterprises.
- **Employment Generation:** The SEZ is projected to create nearly 3,500 direct and indirect jobs. It will contribute significantly to local employment opportunities and skill development.

Multi-Sector SEZ by PIPDIC

- **Location:** The multi-sector SEZ is being developed at Karasur village in Villianur Taluk. It is expected to become a hub for manufacturing and service-oriented industries.
- **Diversified Industrial Base:** Unlike sector-specific SEZs, this project will accommodate multiple industries. This diversification reduces economic risks and encourages broader industrial growth.
- **Export Promotion:** The zone aims to improve the export potential of the region by providing world-class infrastructure. It will facilitate easier access to global markets for industries operating within the zone.
- **Regional Development:** The project is expected to generate economic activity in surrounding areas. It will contribute to infrastructure development and industrial clustering.

What is a Special Economic Zone (SEZ)? (Static: Indian Economy)

- **Definition:** A Special Economic Zone is a geographically designated area treated as a duty-free enclave for trade, customs, and tariff purposes. Although located within India, it enjoys special economic regulations to promote exports and investment.
- **Objective:** SEZs are established to attract foreign investment, increase exports, and generate employment opportunities. They provide a globally competitive business environment through various fiscal and regulatory incentives.
- **Duty-Free Enclave:** Goods imported into SEZs are exempt from customs duties and certain domestic taxes. This reduces production costs and enhances export competitiveness.
- **Export-Oriented Growth:** SEZs are designed to function as engines of economic growth through export promotion. They play an important role in integrating India with global value chains.

Evolution of SEZs in India

- **Export Processing Zones (EPZs):** India established Asia's first Export Processing Zone at Kandla in 1965. The initiative aimed to promote exports through dedicated industrial enclaves.
- **SEZ Policy 2000:** To overcome limitations of EPZs, the Government announced the SEZ Policy in 2000. The policy focused on improving investment attractiveness and simplifying regulations.
- **SEZ Act, 2005:** The policy was given statutory backing through the Special Economic Zones Act, 2005. The Act provided a comprehensive legal framework for establishment and operation of SEZs.
- **SEZ Rules, 2006:** These rules operationalised the provisions of the Act. They laid down procedures relating to approvals, administration, and incentives.

Institutional Framework Governing SEZs

- **Department of Commerce:** It formulates SEZ policy and administers the approval mechanism. It plays the central role in planning and monitoring SEZ development.
- **Board of Approval (BoA):** The BoA is the apex decision-making body for SEZ approvals. It evaluates proposals based on export potential, employment generation, and infrastructure development.
- **Development Commissioner:** The Development Commissioner oversees administration and regulatory compliance within SEZs. It also facilitates approvals and operational clearances.
- **Unit Approval Committee (UAC):** The committee grants approvals to individual units operating in SEZs. It ensures compliance with SEZ regulations and export obligations.

Key Incentives Available to SEZs

- **Duty-Free Imports:** Units can import goods required for development, operation, and maintenance without customs duties. This significantly lowers production costs for export-oriented industries.
- **Zero-Rated GST Benefits:** Supplies to SEZs are treated as zero-rated under the Integrated GST framework. This improves tax efficiency and reduces cascading effects.
- **Single-Window Clearance:** SEZs provide a simplified approval mechanism for businesses. This reduces bureaucratic delays and enhances ease of doing business.
- **Infrastructure Support:** Developers receive support for creating world-class industrial infrastructure. This attracts both domestic and foreign investors.

Recent Reforms in India's SEZ Framework

- **Concessional DTA Sales:** Eligible SEZ units can sell part of their production in the Domestic Tariff Area at

concessional duty rates. This improves capacity utilisation and business viability.

- **Semiconductor Manufacturing Push:** SEZ Rules were amended in 2025 to support semiconductor manufacturing. The reforms reduced land and area requirements for high-technology sectors.
- **RoDTEP Integration:** Benefits under the Remission of Duties and Taxes on Exported Products scheme have been extended. This enhances global competitiveness by neutralising embedded taxes.
- **SEZ 2.0 Initiative:** A high-level committee has been constituted to redesign the SEZ framework. It aims to align India's SEZ regime with evolving WTO norms and economic realities.

Economic Significance of SEZs

- **Investment Generation:** SEZs have attracted investments worth approximately ₹8 lakh crore by the end of 2025. They remain an important instrument for industrial and infrastructure development.
- **Export Growth Engine:** Exports from operational SEZs crossed ₹11.70 lakh crore during 2025-26 (up to December 2025). This highlights their growing contribution to India's external trade.
- **Employment Creation:** SEZs have generated employment for more than 31 lakh people. They contribute significantly to both direct and indirect job creation.
- **Services Sector Leadership:** IT and ITES SEZs account for a substantial share of India's services exports. They strengthen India's position as a global digital services hub.

Significance of the New Puducherry SEZs

- **Boost to the TAP Region:** The projects strengthen the economic potential of the Tamil Nadu–Andaman & Nicobar–Puducherry (TAP) region. They are expected to attract investments and improve regional competitiveness.
- **Export-Led Development:** The SEZs will promote exports through better infrastructure and business facilitation. This aligns with India's objective of increasing export-led economic growth.
- **Decentralised Industrialisation:** Municipal participation in SEZ development sets a new governance model. It empowers local institutions to directly contribute to economic development.
- **Employment and Skill Development:** The projects will create jobs across sectors and enhance workforce capabilities. This is particularly important for youth employment and regional prosperity.



Challenges Associated with SEZs

- **Land Acquisition Issues:** Acquisition of contiguous land remains a challenge in several states. It often leads to social and environmental concerns.
- **WTO Compliance:** Certain tax incentives have faced scrutiny under World Trade Organization rules. This necessitates continuous policy adaptation.
- **Underutilisation of Land:** Some notified SEZs have remained underutilised due to market conditions. Improving occupancy rates remains an important policy objective.
- **Manufacturing Constraints:** While services exports have flourished, manufacturing growth in SEZs has been relatively modest. Addressing infrastructure and logistics gaps is necessary for improvement.

Way Forward

- **Implement SEZ 2.0 Reforms:** Modernise the SEZ framework to enhance competitiveness and compliance with global trade norms. This will improve investment attractiveness and export performance.
- **Promote High-Tech Manufacturing:** Focus on semiconductors, electronics, renewable energy, and advanced manufacturing sectors. This can help India integrate into global supply chains.
- **Strengthen Local Governance Participation:** Encourage greater involvement of Urban Local Bodies and state agencies. This can facilitate decentralised industrial development.
- **Enhance Ease of Doing Business:** Simplify procedures and improve infrastructure quality. This will attract both domestic and foreign investors.

Conclusion

The notification of two new Special Economic Zones in Puducherry represents an important milestone in India's industrial and export strategy. The participation of an Urban

Local Body in SEZ development introduces a new dimension of decentralised economic governance. Combined with ongoing reforms under the SEZ framework, these projects have the potential to boost exports, generate employment, and strengthen regional economic growth.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to Special Economic Zones (SEZs) in India, consider the following statements:

1. Goods supplied from an SEZ to the Domestic Tariff Area (DTA) are treated as imports into India.
2. The Special Economic Zones Act was enacted in 2005 to provide a statutory framework for SEZs.
3. India's first Export Processing Zone (EPZ) was established at Kandla in 1965.

How many of the above statements are correct?

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

Answer: (c)

Descriptive Question

Q. "Special Economic Zones have evolved from export promotion enclaves to instruments of regional development, employment generation, and industrial transformation." Examine in the context of recent SEZ reforms and the newly notified SEZs in Puducherry. (15 marks, 250 words).

Union Finance Minister Flags '3F' Concerns – Fuel, Fertiliser and Foreign Exchange

Why in News: Nirmala Sitharaman highlighted concerns regarding the **3Fs – Fuel, Fertiliser and Foreign Exchange (Forex)** amid rising geopolitical tensions in West Asia, while emphasizing the resilience of the Indian economy.

Key Details

- India remains heavily dependent on imports for crude oil, fertilisers, and several critical raw materials. Any disruption in West Asia directly impacts India's inflation, trade balance, and economic stability.
- Rising geopolitical tensions have increased concerns over energy security and supply chain disruptions. This may lead to higher import costs and pressure on public finances.
- Fuel, fertiliser, and forex are closely linked to inflation, agriculture, and external sector stability. Therefore, policymakers closely monitor these sectors during global crises.
- Despite external challenges, India's macroeconomic fundamentals remain relatively strong. Robust growth, adequate forex reserves, and policy measures provide resilience against shocks.

Fuel Security and Energy Dependence (Static: Energy Economics)

- **High Import Dependence:** India imports more than 85% of its crude oil requirement. This makes the economy vulnerable to fluctuations in global oil prices.
- **Impact on Current Account Deficit (CAD):** Rising crude prices increase the import bill. Higher imports widen the trade deficit and put pressure on the current account.
- **Inflationary Effects:** Expensive fuel raises transportation and production costs across sectors. This eventually increases retail inflation and affects household budgets.
- **Fiscal Implications:** Governments may reduce fuel taxes or increase subsidies during price spikes. This can affect fiscal deficit targets and public finances.

Fertiliser Security and Agricultural Stability (Static: Agriculture & Food Security)

- **Import Dependency:** India imports fertilisers and key inputs such as ammonia, phosphates, and potash. Many of these supplies originate from West Asia and other global markets.
- **Impact on Farmers:** Higher fertiliser prices increase the cost of cultivation. This affects farm profitability, especially for small and marginal farmers.
- **Food Security Concerns:** Supply disruptions can affect agricultural productivity and crop yields. This may create pressure on food availability and food inflation.
- **Subsidy Burden:** The government often increases fertiliser subsidies to protect farmers. This can significantly increase expenditure commitments.

Foreign Exchange (Forex) and External Sector Stability (Static: Balance of Payments)

- **Higher Dollar Demand:** Rising oil imports require larger payments in US dollars. This increases pressure on the foreign exchange market.
- **Rupee Depreciation:** Increased demand for dollars can weaken the Indian rupee. A depreciating rupee makes imports more expensive and fuels inflation.
- **Pressure on Forex Reserves:** The RBI may use foreign exchange reserves to stabilize the currency. Continuous intervention can reduce reserve buffers over time.
- **Capital Outflows:** Global uncertainty often leads investors to move funds to safer assets. This can reduce capital inflows into emerging economies like India.

Broader Economic Concerns

- **Inflationary Pressures:** Rising fuel and fertiliser prices affect transportation, food, and manufacturing costs. This can lead to broad-based inflation across the economy.
- **Fiscal Stress:** Increased subsidies and revenue sacrifices can affect fiscal discipline. The government may face challenges in maintaining fiscal deficit targets.
- **Impact on Growth:** Higher input costs can reduce industrial production and consumer demand. This may slow overall economic growth.
- **External Vulnerability:** Dependence on imported energy increases exposure to geopolitical shocks. Any prolonged disruption can affect macroeconomic stability.

Reforms Needed

- **Diversification of Energy Sources:** India should reduce excessive dependence on a few oil-exporting regions. Expanding energy partnerships can improve long-term energy security.
- **Strategic Petroleum Reserves (SPR):** Expanding storage capacity can provide protection during supply disruptions. It acts as a buffer against sudden global price shocks.
- **Renewable Energy Transition:** Greater investment in solar, wind, green hydrogen, and electric mobility is essential. This will reduce dependence on imported fossil fuels over time.
- **Self-Reliance in Fertilisers:** Promoting domestic production and alternative nutrient sources is necessary. This can improve agricultural resilience and reduce import dependence.

Way Forward

- **Strengthen Export Competitiveness:** Improving manufacturing efficiency and logistics can boost exports. A stronger export base will support forex earnings and reduce trade deficits.
- **Encourage Stable Capital Inflows:** Long-term FDI and infrastructure investments should be prioritised. These flows are more stable than short-term portfolio investments.
- **Maintain Fiscal Prudence:** Balancing welfare measures with fiscal sustainability remains important. This helps preserve macroeconomic stability during external shocks.
- **Enhance Economic Resilience:** Diversification, innovation, and structural reforms are essential. These measures will help India withstand future global uncertainties.

Conclusion

The Finance Minister's focus on the **3Fs – Fuel, Fertiliser and Forex** highlights key vulnerabilities of the Indian economy during periods of geopolitical uncertainty. Strengthening energy security, reducing fertiliser import dependence, and maintaining external sector stability will be crucial for sustaining growth, controlling inflation, and ensuring long-term economic resilience.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the '3F' concerns recently highlighted by the Finance Minister, consider the following statements:

1. Rising crude oil prices can widen India's Current Account Deficit.
2. Higher fertiliser prices may increase the government's subsidy burden.
3. A depreciation of the Indian rupee reduces the cost of imports.

How many of the above statements are correct?

- (a) Only one
(b) Only two

- (c) All three
- (d) None

Answer: (b)

Descriptive Question

Q. "Fuel, Fertiliser and Foreign Exchange constitute critical pillars of India's economic stability." Examine the challenges posed by external geopolitical shocks and suggest measures to strengthen India's resilience. (250 words).

Mission Arunachal Kiwi

Why in News: Recently, the Ministry of Development of North Eastern Region launched **Mission Arunachal Kiwi** to promote Arunachal Pradesh as India's premium organic kiwi hub under the **Viksit North East Vision**.

Key Details

- The mission has an estimated outlay of **₹167 crore** and follows a convergence-based implementation model. It brings together central ministries, state agencies, institutions, and private stakeholders for integrated development.
- Arunachal Pradesh produces **more than 50% of India's kiwi output**. The state was also the first in India to receive organic kiwi certification.
- The initiative is part of the **"One State–One USP"** strategy for the North East Region. It focuses on promoting region-specific products with strong market potential.
- The mission aims to establish **"Arunachal Organic Kiwi"** as a premium national and global brand. This is expected to improve farmer income and strengthen export competitiveness.

One State–One USP Initiative (GS-II: Government Policies & Interventions)

- The initiative promotes unique products from each North-Eastern state based on comparative advantages. It seeks to enhance value addition, branding, and market access for local producers.
- Examples include **Lakadong Turmeric (Meghalaya), Coffee (Nagaland), Ginger (Mizoram), and Muga Silk (Assam)**. This approach supports regional economic development and livelihood generation.

Objectives of Mission Arunachal Kiwi

- The mission seeks to address challenges such as low farmer remuneration and distress sales. It aims to create a more efficient and profitable value chain for kiwi growers.
- It also focuses on improving cold-storage facilities, certification standards, and branding. These measures will help farmers access premium domestic and international markets.
- Export linkages and market integration are key priorities under the programme. This will enhance the global visibility of Arunachal's organic produce.

Cluster-Based Development Model (GS-III: Agriculture)

- The programme adopts a cluster-based approach to improve production and post-harvest management. This

helps achieve economies of scale and better infrastructure utilisation.

- Six integrated hubs will be developed in **Ziro Valley, Dirang, Kalaktang, Shi Yomi, and Dibang Valley**. These hubs will support storage, processing, grading, and transportation facilities.

Strategic Pillars of the Mission

- **Convergence:** Multiple ministries and agencies will work together for effective implementation. This reduces duplication and improves resource utilisation.
- **Value Addition:** Processing and packaging facilities will be strengthened. This will help farmers capture a larger share of the final market value.
- **Branding:** "Arunachal Organic Kiwi" will be promoted as a premium product. Strong branding can improve consumer recognition and market demand.
- **Market Integration:** Better domestic and export linkages will be developed. This will ensure wider market access and price realisation for farmers.

Market Opportunity

- Arunachal's kiwi harvest season falls between **November and January**. This coincides with the off-season of major producer countries such as New Zealand.
- The timing creates export opportunities in **South-East Asia, Europe, and the Middle East**. It enables India to cater to international demand during supply gaps.

Significance

- The mission is expected to reduce post-harvest losses through improved cold-chain infrastructure. This will increase the shelf life and quality of kiwi produce.
- It will strengthen organic farming and promote sustainable agricultural practices. The initiative aligns with the broader objectives of rural development and agricultural diversification.
- Higher value realisation can significantly improve farmer incomes. This contributes to inclusive growth in the North-Eastern region.

Conclusion

Mission Arunachal Kiwi represents a focused effort to transform Arunachal Pradesh into India's leading organic kiwi hub. Through infrastructure development, branding, value addition, and export promotion, the initiative can strengthen farmer livelihoods and enhance the global presence of North-Eastern agricultural products.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to Mission Arunachal Kiwi, consider the following statements:

1. Arunachal Pradesh produces more than half of India's kiwi output.
2. The mission is part of the "One State–One USP" approach for the North-East Region.
3. The kiwi harvesting season in Arunachal Pradesh coincides with New Zealand's peak production season.

How many of the above statements are correct?

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

Answer: (b)

ILO Complaint by Tea Workers and Labour Rights Protection

Why in News: The **Paschim Banga Cha Majoor Samity**, a tea workers' trade union from West Bengal, has filed a formal representation before the International Labour Organization under **Article 24 of the ILO Constitution**, alleging inadequate implementation of labour rights protections in India's tea plantation sector.

Key Details

- The complaint alleges failure in ensuring labour rights related to **forced labour, equal remuneration, non-discrimination, and protection of tribal communities**. The representation seeks examination of India's compliance with international labour commitments.
- The complaint has been submitted under **Article 24 of the ILO Constitution**. This provision allows recognised workers' and employers' organisations to raise concerns regarding implementation of ratified ILO conventions.
- The issue highlights challenges faced by plantation workers regarding wages, working conditions, and social security benefits. It also brings attention to labour welfare in the informal and agricultural sectors.
- The case demonstrates the role of international institutions in monitoring labour standards. It reinforces the importance of balancing economic growth with social justice and workers' rights.

Article 24 of the ILO Constitution (Static: International Institutions)

- **What is Article 24?** It is a grievance redressal mechanism under the ILO Constitution. It allows workers' and employers' organisations to submit representations against member states for non-compliance with ratified conventions.
- **Who Can File a Complaint?** Only recognised industrial associations such as trade unions and employers' organisations are eligible. Individual citizens and non-recognised NGOs cannot directly invoke Article 24.
- **Scope of Application:** The mechanism applies only to conventions that have already been ratified by the member country. It focuses on effective implementation rather than mere legal adoption.
- **Significance:** It promotes accountability and encourages member states to comply with international labour standards. It serves as an important supervisory mechanism within the ILO framework.

International Labour Organization (ILO) (Static: UPSC Prelims Important)

- **Establishment:** The ILO was established in **1919 under the Treaty of Versailles** and became the first specialised agency of the United Nations in 1946. It promotes decent work, social justice, and internationally recognised labour rights.

- **Headquarters:** The organisation is headquartered in **Geneva, Switzerland**. It operates through a unique tripartite structure involving governments, employers, and workers.
- **Tripartite Structure:** The ILO is the only UN agency with equal participation of governments, employers, and workers in decision-making. This ensures balanced representation of labour and industry interests.
- **Core Objective:** The organisation seeks to improve working conditions, eliminate forced labour, and promote social dialogue. It also supports employment generation and social protection measures globally.

India and ILO Conventions

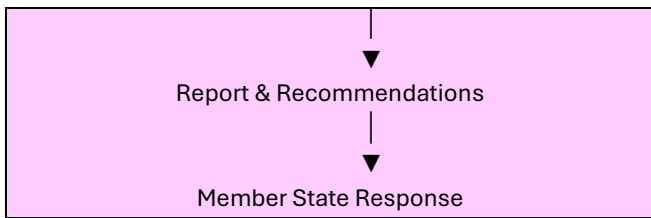
- **Convention Ratification:** India has ratified **6 out of the 10 Fundamental ILO Conventions**. Ratification creates an international obligation to implement the provisions effectively.
- **Important Ratified Conventions:** These include conventions relating to **forced labour, equal remuneration, child labour, and discrimination**. They form the foundation of labour rights protection in India.
- **Labour Reforms:** Recent labour reforms have consolidated numerous labour laws into four labour codes. The objective is to improve compliance, ease of doing business, and worker welfare.
- **Implementation Challenge:** Effective enforcement remains a concern, especially in informal sectors such as plantations and agriculture. Monitoring and institutional capacity are crucial for achieving intended outcomes.

Tea Plantation Sector and Labour Concerns

- **Economic Importance:** India is one of the world's largest tea producers and exporters. The tea industry provides employment to millions of workers, particularly in eastern and northeastern states.
- **Worker Vulnerability:** Plantation workers often face issues related to low wages, inadequate housing, and limited access to healthcare. Women workers constitute a significant proportion of the workforce.
- **Social Justice Dimension:** Many tea garden workers belong to Scheduled Tribes and other vulnerable communities. Their welfare is linked to constitutional principles of equality and social justice.
- **Need for Welfare Measures:** Improving working conditions and social security coverage remains a policy priority. This is essential for inclusive and sustainable economic development.

Article 24 Complaint Mechanism:





Way Forward

- **Strengthen Labour Inspections:** Regular monitoring can improve compliance with labour laws and international commitments. This will help protect vulnerable workers in plantation and informal sectors.
- **Improve Social Security Coverage:** Expanding access to healthcare, housing, and welfare benefits is essential. It can enhance both worker welfare and productivity.
- **Promote Social Dialogue:** Greater cooperation among governments, employers, and workers can resolve disputes effectively. This aligns with the core philosophy of the ILO.
- **Focus on Effective Implementation:** Ratification alone is insufficient without proper enforcement. Institutional capacity and accountability mechanisms must be strengthened.

Conclusion

The ILO complaint by tea workers highlights the continuing importance of labour rights, social justice, and international accountability mechanisms. For India, ensuring effective implementation of labour standards is essential not only for fulfilling international obligations but also for promoting inclusive and sustainable development.

Sugarcane FRP Hike 2026-27

Why in News: The Cabinet Committee on Economic Affairs (CCEA) has approved an increase in the **Fair and Remunerative Price (FRP)** of sugarcane to **₹365 per quintal** for the 2026-27 sugar season, benefiting millions of sugarcane farmers across India.

Key Details

- The FRP of sugarcane has been increased from ₹355 to ₹365 per quintal for the 2026-27 season. This aims to ensure remunerative returns to farmers amid rising cultivation costs.
- The decision was taken by the CCEA based on recommendations of the Commission for Agricultural Costs and Prices (CACP). It reflects the government's commitment to farmer welfare and income security.
- Sugar mills are legally required to pay FRP to farmers for procured sugarcane. Failure to do so can attract penalties under the Sugarcane (Control) Order, 1966.

Fair and Remunerative Price (FRP) (Static: Agricultural Pricing Policy)

- **Definition:** FRP is the minimum price that sugar mills must pay to sugarcane farmers. It ensures assured returns and protects farmers from price exploitation.
- **Legal Backing:** FRP is notified under the Sugarcane (Control) Order, 1966. Unlike MSP, it is legally enforceable and mandatory for sugar mills.

- **Price Determination:** The CCEA fixes FRP based on CACP recommendations. Factors such as production cost, demand-supply, and sugar recovery rates are considered.

FRP vs MSP

- **FRP:** Payment by sugar mills is compulsory under law. Farmers are guaranteed the notified price for their produce.
- **MSP:** MSP is announced for several crops by the government. Government procurement is not legally mandatory for all MSP crops.

Significance of the FRP Hike

- **Farmer Welfare:** Higher FRP improves income security for sugarcane farmers. It helps offset increasing input and cultivation costs.
- **Rural Economy:** Better farmer incomes increase rural consumption and economic activity. This supports inclusive agricultural growth.
- **Sugar Sector Stability:** Timely and fair payments improve relations between mills and farmers. It also strengthens the overall sugar value chain.

Challenges

- **Financial Stress on Mills:** Higher FRP may increase the financial burden on sugar mills. Delayed payments to farmers remain a recurring concern.
- **Regional Price Differences:** Some states announce State Advised Prices (SAP) above FRP. This creates pricing disparities across states.

Way Forward

- Ensure timely payment of dues to sugarcane farmers through strict enforcement mechanisms. This will enhance farmer confidence and sectoral stability.
- Promote ethanol blending and diversification of sugar sector revenues. This can improve the financial health of sugar mills.

Conclusion

The increase in sugarcane FRP to ₹365 per quintal reflects the government's focus on farmer welfare and agricultural sustainability. Effective implementation and timely payments will be crucial for ensuring the intended benefits reach farmers.

Roadmap for Fertiliser Reforms

Why in News: The Prime Minister has recently emphasized the need to **reduce dependence on chemical fertilizers by 50%**, highlighting concerns related to rising subsidy burdens, import dependence, soil degradation, and the need for sustainable agricultural practices.

Key Details

- **Import Dependence:** India remains heavily dependent on imports of raw materials such as phosphatic and potassic fertilizers, exposing the agriculture sector to global supply disruptions and geopolitical uncertainties.
- **Subsidy Burden:** Fertilizer subsidies continue to place significant pressure on government finances, necessitating reforms that promote efficient nutrient use rather than excessive consumption.

- **Sustainable Agriculture:** The focus is shifting towards nano-fertilizers, bio-fertilizers, natural farming, and precision agriculture to improve productivity while reducing environmental damage.
- **Policy Transition:** Fertilizer reforms are increasingly being linked with food security, fiscal sustainability, soil health, and long-term agricultural resilience.

Importance

- **Agricultural Productivity:** Chemical fertilizers played a crucial role in the success of the Green Revolution by supplying essential nutrients required for high-yielding crop varieties and intensive cultivation.
- **Food Security:** Fertilizers remain critical for sustaining production of staple crops such as rice and wheat, which support India's food security and Public Distribution System (PDS).
- **Rural Economy:** Higher agricultural productivity contributes to farm incomes, rural employment, and overall economic growth, given the continued dependence of a large population on agriculture.
- **Inflation Management:** Stable agricultural output helps control food inflation and contributes to macroeconomic stability.

Dependence

- **Import Vulnerability:** India has limited domestic reserves of rock phosphate, potash, and sulphur, making it dependent on imports from countries such as Morocco, Saudi Arabia, Jordan, and Russia.
- **Geopolitical Risks:** Global conflicts, disruptions in shipping routes, or instability in regions such as West Asia can directly affect fertilizer availability and prices in India.
- **External Exposure:** Excessive import dependence also increases pressure on foreign exchange reserves and weakens long-term agricultural self-reliance.

Imbalance

- **Excessive Urea Use:** Urea continues to receive higher subsidies compared to other nutrients, encouraging farmers to overuse nitrogen-based fertilizers.
- **Distorted NPK Ratio:** In several regions, the Nitrogen-Phosphorus-Potassium (NPK) ratio has become highly skewed, moving far away from the recommended 4:2:1 balance.
- **Low Efficiency:** A substantial portion of applied nitrogen is lost through volatilisation and leaching, resulting in economic losses and environmental pollution.

Degradation

- **Declining Soil Health:** Continuous and excessive use of chemical fertilizers has reduced soil organic carbon and adversely affected soil fertility in many agricultural regions.
- **Micronutrient Deficiency:** Deficiencies of Zinc, Boron, Sulphur, and other micronutrients are increasingly being reported, reducing crop productivity despite higher fertilizer application.
- **Yield Saturation:** In several intensively cultivated areas, increasing fertilizer doses are no longer producing proportionate increases in crop yields.

Environment

- **Water Pollution:** Excess fertilizer application leads to nutrient runoff and groundwater contamination, affecting aquatic ecosystems and drinking water quality.
- **Greenhouse Emissions:** Production and overuse of fertilizers contribute to greenhouse gas emissions, particularly nitrous oxide, a potent greenhouse gas.
- **Ecological Stress:** Long-term dependence on synthetic fertilizers can reduce soil biodiversity and weaken ecosystem resilience.

Reforms

- **Nutrient-Based Subsidy (NBS):** The government has introduced NBS for phosphatic and potassic fertilizers to encourage balanced nutrient application.
- **Neem-Coated Urea:** Neem coating improves nitrogen-use efficiency and reduces diversion of subsidized urea for non-agricultural purposes.
- **PM-PRANAM Scheme:** The scheme incentivizes states to reduce chemical fertilizer consumption and promote sustainable alternatives.
- **Soil Health Card Scheme:** It provides farmers with scientific information regarding nutrient status and fertilizer requirements of their fields.

Innovation

- **Nano Fertilizers:** Nano Urea and Nano DAP aim to improve nutrient-use efficiency while reducing fertilizer consumption and logistics costs.
- **Precision Agriculture:** Technologies such as drones, sensors, GIS mapping, and data analytics enable site-specific nutrient management.
- **Fertigation:** Combining fertilizers with drip irrigation ensures efficient nutrient delivery and minimizes wastage.
- **Digital Monitoring:** Systems such as Integrated Fertilizer Management System (iFMS) improve transparency and reduce diversion.

Alternatives

- **Bio-fertilizers:** Microorganisms such as Rhizobium, Azotobacter, and Azospirillum naturally enhance nutrient availability and reduce dependence on synthetic fertilizers.
- **Natural Farming:** Approaches based on local resources promote ecological balance and reduce input costs.
- **Green Manuring:** Cultivation of leguminous crops such as Dhaincha and Sunnhemp improves soil fertility through biological nitrogen fixation.
- **Organic Inputs:** Compost, bio-slurry, farmyard manure, and biochar contribute to long-term soil health improvement.

Challenges

- **Transition Risks:** Abrupt reduction in fertilizer use may affect crop productivity and farmer incomes, particularly in high-input agricultural regions.
- **Awareness Gaps:** Many farmers continue to lack adequate knowledge regarding balanced nutrient application and sustainable alternatives.

- **Technology Access:** Precision agriculture tools, drones, and advanced nutrient management systems remain inaccessible to many small and marginal farmers.
- **Market Constraints:** Availability, affordability, and quality assurance of bio-fertilizers and organic inputs remain major concerns.

Way Forward

- **Balanced Nutrient Management:** Promote scientific fertilizer use based on Soil Health Card recommendations and crop-specific requirements.
- **Gradual Reduction Strategy:** Adopt a phased approach that combines chemical fertilizers with bio-fertilizers and organic nutrient sources rather than abrupt elimination.
- **Strengthening DBT:** Shift from product-based subsidies to farmer-centric support systems to encourage efficient fertilizer usage.
- **Promoting Circular Economy:** Expand initiatives such as GOBARdhan to convert agricultural and livestock waste into valuable organic inputs.
- **Technology Integration:** Encourage the use of drones, fertigation systems, precision farming tools, and digital advisory platforms to improve nutrient-use efficiency.
- **Research and Innovation:** Strengthen research on nano-fertilizers, bio-fertilizers, climate-resilient agriculture, and sustainable nutrient management practices.

Conclusion

India's fertilizer policy must strike a balance between ensuring food security and promoting long-term agricultural sustainability. While chemical fertilizers remain essential for maintaining crop productivity, excessive dependence has created economic, environmental, and soil-health challenges. A gradual transition towards balanced nutrient

management, precision agriculture, bio-fertilizers, and farmer-centric reforms can reduce import dependence, improve soil fertility, and strengthen the resilience of Indian agriculture. Such reforms will be critical for achieving sustainable agricultural growth, nutritional security, and ecological sustainability in the coming decades.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to fertilizer management in India, consider the following statements:

1. Urea is currently covered under the Nutrient-Based Subsidy (NBS) Scheme.
2. Neem-coated urea improves nitrogen-use efficiency.
3. Soil Health Cards provide information on nutrient status and fertilizer requirements of agricultural land.

Which of the statements given above is/are correct?

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

Answer: (a)

Descriptive Question

Q. Excessive dependence on chemical fertilizers has created economic, environmental, and agricultural challenges in India. Discuss the need for fertilizer reforms and examine the measures required to promote sustainable nutrient management. (15 Marks, 250 Words).

ENVIRONMENT & GEOGRAPHY

AMOC Collapse and Its Implications for India's Climate Security

Why in News: Recent scientific studies have warned that the Atlantic Meridional Overturning Circulation (AMOC) could weaken by nearly **59% by 2100** due to climate change, raising concerns over global weather disruptions, sea-level rise, and weakening of the Indian monsoon system.

Key Details

- The AMOC is a major ocean circulation system that redistributes heat across the planet. It plays a critical role in regulating climate patterns in Europe, Africa, the Americas, and Asia.
- New research suggests the AMOC may weaken much faster than previously estimated. A significant slowdown could push the system towards a climatic “tipping point”.
- Melting Arctic ice is increasing freshwater flow into the North Atlantic Ocean. This reduces salinity and density of ocean water, weakening the sinking mechanism that drives AMOC circulation.
- A weakening AMOC could severely disrupt the Indian summer monsoon. This may affect agriculture, water security, food production, and rural livelihoods in India.

Understanding AMOC

- **Global Ocean Conveyor Belt:** The AMOC functions like a giant conveyor belt carrying warm surface water northward and cold deep water southward. This circulation helps maintain Earth's energy balance and moderates regional climates.
- **Thermohaline Circulation:** Ocean currents move due to differences in temperature and salinity, known as thermohaline circulation. Cold and saline water becomes denser and sinks, driving deep ocean currents.
- **Heat Redistribution:** The AMOC transports tropical heat towards northern latitudes. This is one reason why Western Europe experiences relatively mild winters despite high latitude.
- **Slow but Powerful Process:** A single parcel of ocean water may take nearly 1,000 years to complete the circulation cycle. Despite its slow pace, the AMOC strongly influences long-term climate stability.

Climate Change and the Tipping Point

- **Arctic Ice Melt:** Rising global temperatures are accelerating melting of Greenland and Arctic ice sheets. The influx of freshwater into the Atlantic weakens the density-driven sinking process.
- **Reduction in Salinity:** Freshwater dilution lowers ocean salinity levels in the North Atlantic. Less saline water is

lighter and does not sink efficiently, slowing the circulation.

- **Climate Tipping Point:** Scientists describe AMOC as a “tipping element” in the climate system. Once a critical threshold is crossed, the circulation may collapse irreversibly into a weaker state.
- **Long-Term Risks:** Such a collapse could trigger abrupt climatic changes across multiple continents. It may alter rainfall patterns, ocean temperatures, and atmospheric circulation systems globally.

AMOC and El Niño Connection

- **Interconnected Ocean Systems:** Changes in Atlantic circulation influence Pacific Ocean temperatures and wind patterns. This demonstrates the interconnected nature of global climate systems.
- **Impact on El Niño:** A weaker AMOC may intensify and destabilise El Niño events. Strong El Niño years are associated with droughts, heatwaves, and suppressed monsoon rainfall in India.
- **Recent Examples:** The 2015–16 and 2023–24 El Niño events caused major global weather disruptions. India witnessed rainfall deficits, rising temperatures, and agricultural stress during these years.
- **Compound Climate Risks:** Simultaneous weakening of AMOC and stronger El Niño events can amplify extreme weather conditions. This increases uncertainty in seasonal climate prediction and disaster preparedness.

WHY AMOC COLLAPSE COULD TRIGGER A GLOBAL CRISIS

- **1 THE OCEAN'S THERMOSTAT:**
The AMOC is a massive “conveyor belt” of ocean currents in the Atlantic that moves heat across the globe, heavily influencing worldwide weather patterns.
- **2 A LOOMING COLLAPSE:**
Melting Arctic ice is dumping fresh water into the Atlantic, acting as a brake on these currents. Scientists warn the system is slowing down and could cross a catastrophic “tipping point” of no return.
- **3 GLOBAL CHAOS:**
If the AMOC collapses, it will disrupt weather globally, trapping heat in ways that make phenomena like El Niño far more unpredictable and extreme.
- **4 THREAT TO INDIA:**
For India, a halted Atlantic conveyor belt would pull the tropical rain belt southward, severely destabilising the summer monsoon, triggering longer dry spells, and threatening the nation's agriculture.

Impact on Indian Monsoon

- **Monsoon Dependence:** The Indian summer monsoon supports nearly half of India's agriculture and water needs. Millions of farmers depend directly on timely and adequate rainfall for crop production.
- **Shift in Tropical Rain Belt:** A slowing AMOC may shift tropical rainfall belts southward. This can weaken

moisture-bearing winds flowing from the Arabian Sea towards India.

- **Reduced Rainfall:** Research suggests India could experience shorter wet seasons and prolonged dry spells. This may increase frequency of droughts in rain-fed agricultural regions.
- **Extreme Weather Variability:** Monsoon behaviour may become more erratic and uneven. India could face alternating cycles of droughts, cloudbursts, and destructive floods.

Food Security and Economic Implications

- **Agricultural Vulnerability:** Crops like rice, pulses, sugarcane, and cotton are highly dependent on monsoon rainfall. Weakening monsoons can reduce productivity and threaten farmer incomes.
- **Water Stress:** Reduced rainfall affects reservoirs, groundwater recharge, and drinking water availability. This could intensify urban and rural water crises across India.
- **Inflationary Pressure:** Lower agricultural output may increase food prices and inflation. This can disproportionately affect poor and vulnerable populations.
- **Economic Consequences:** Climate-induced disruptions impact rural employment, hydropower generation, and overall economic stability. India's GDP growth remains sensitive to monsoon performance despite economic diversification.

Global Consequences of AMOC Weakening

- **Sea-Level Rise:** A slowdown in AMOC can increase sea levels along the eastern coast of North America. This may intensify coastal flooding and erosion risks.
- **Extreme Weather Events:** Europe may experience colder winters, while tropical regions may face rainfall disruptions. Global weather instability is expected to increase significantly.
- **Marine Ecosystem Disruption:** Ocean circulation influences nutrient transport and marine biodiversity. Changes may affect fisheries and ocean productivity.
- **Climate Migration Risks:** Severe climate disruptions can trigger displacement and migration pressures globally. This may create humanitarian and geopolitical challenges in vulnerable regions.

India's Climate Response and Policy Measures

- **National Action Plan on Climate Change (NAPCC):** India has launched missions focusing on sustainable agriculture, water, and ecosystem protection. These missions aim to strengthen climate resilience across sectors.
- **Early Warning Systems:** IMD and climate institutions are improving weather forecasting and disaster preparedness mechanisms. Better forecasting helps reduce losses from extreme climate events.
- **Renewable Energy Expansion:** India is rapidly increasing solar and wind energy capacity to reduce dependence on fossil fuels. This supports India's

climate mitigation commitments under the Paris Agreement.

- **International Leadership:** India actively participates in climate diplomacy through initiatives like the International Solar Alliance (ISA). It advocates climate justice and sustainable development for developing countries.

Way Forward

- **Strengthening Climate Research:** India must invest in advanced oceanographic and climate modelling systems. This will improve understanding of long-term monsoon and ocean circulation changes.
- **Climate-Resilient Agriculture:** Promoting drought-resistant crops and efficient irrigation systems is essential. This can reduce agricultural vulnerability to rainfall variability.
- **Integrated Water Management:** Conservation of wetlands, rivers, and groundwater resources must be prioritised. Sustainable water governance is critical for future climate resilience.
- **Global Climate Cooperation:** International collaboration is necessary to reduce greenhouse gas emissions. Preventing dangerous climate tipping points requires coordinated global action.

Conclusion

The potential weakening of the AMOC highlights how interconnected Earth's climate systems are. Though centred in the Atlantic Ocean, its disruption could severely impact India's monsoon, food security, economy, and disaster profile. Strengthening climate adaptation, scientific research, and global cooperation will be essential to safeguard long-term environmental and economic stability.

Changing Air Pollution Patterns – Rise of Ground-Level Ozone

Why in News: A new air quality dashboard based on Central Pollution Control Board data highlights a shift in pollution trends—decline in NO₂ and CO but a rise in ground-level ozone across Delhi-NCR.

Key Details

- Long-term data since 2015 shows declining trends in nitrogen dioxide (NO₂) and carbon monoxide (CO). This indicates improvements in combustion-related emissions due to better fuel standards and regulations.
- Ground-level ozone is emerging as a major pollutant, especially during summer months. This reflects a shift from primary pollutants to secondary pollutants in urban air quality.
- PM_{2.5} and PM₁₀ levels show seasonal peaks, especially during winter months. These peaks are influenced by meteorological conditions like low wind speed and temperature inversion. Decline in Primary Pollutants: PM_{2.5} levels dropped from **117.5 µg/m³ (2015)** to **96.4 µg/m³ (2025)**, while PM₁₀ fell from **244 µg/m³** to **197 µg/m³**.

- Pollution trends are not uniform, with nearby NCR cities showing worsening conditions. This highlights the regional nature of air pollution and need for coordinated policy action. **Shift in Pollutants:** Annual average ozone in Delhi rose from $52 \mu\text{g}/\text{m}^3$ in 2021 to $66 \mu\text{g}/\text{m}^3$ in 2025.

Air Pollutants: Types and Sources

- **Primary Pollutants:** These are directly emitted from sources like vehicles and industries. Examples include NO_2 , CO, $\text{PM}_{2.5}$, and PM_{10} , mainly from combustion and dust sources.
- **Secondary Pollutants:** These are formed through chemical reactions in the atmosphere. Ozone is a key secondary pollutant formed under sunlight from precursor gases.
- **$\text{PM}_{2.5}$ vs PM_{10} :** Fine particles ($\text{PM}_{2.5}$) penetrate deep into lungs, while PM_{10} affects upper respiratory tract. Both are harmful and contribute significantly to health issues and reduced visibility.
- **Sources of Pollution:** Vehicles, industries, construction dust, and biomass burning are major contributors. Seasonal factors like stubble burning also intensify pollution levels in North India.

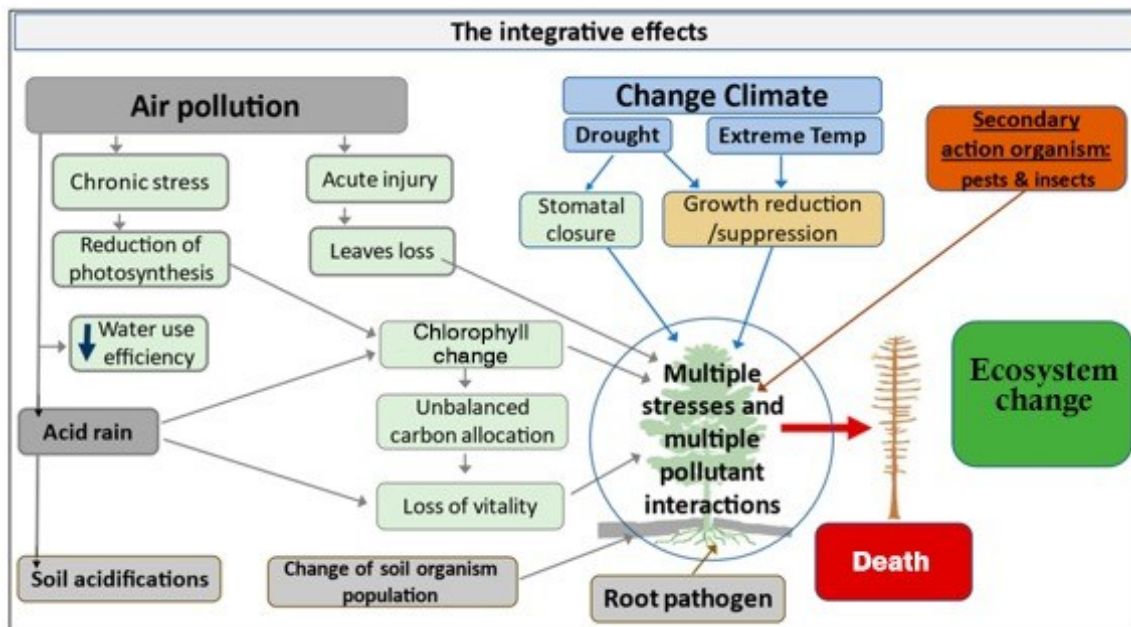
Ground-Level Ozone: Formation and Risks

- **Photochemical Reaction:** Ozone forms when NO_x and volatile organic compounds react in sunlight. This makes it more prominent during hot and sunny conditions, especially in summer.

- **Not Directly Emitted:** Unlike other pollutants, ozone is not released directly into the air. It is formed secondarily, making it harder to control through direct emission reduction.
- **Health Impacts:** High ozone levels can cause respiratory issues and aggravate asthma. It also reduces lung function and affects vulnerable populations like children and elderly.
- **Environmental Impact:** Ozone damages crops and reduces agricultural productivity. It also affects ecosystems and contributes to climate change.

Seasonal Variability of Pollution

- **Winter Peak:** Pollution levels rise sharply between October and February. This is due to temperature inversion and stagnant air that trap pollutants near the surface.
- **Monsoon Dip:** Rainfall and strong winds help disperse pollutants. However, this does not necessarily mean emissions have reduced significantly.
- **Summer Ozone Peak:** Ozone levels rise during March–June due to strong sunlight. This creates a new seasonal pollution challenge distinct from winter smog.
- **Meteorological Influence:** Weather conditions play a key role in pollution levels. They determine dispersion, concentration, and chemical reactions in the atmosphere.



Trends in Delhi-NCR Pollution

- **$\text{PM}_{2.5}$ and PM_{10} :** Levels have slightly declined but remain above safe limits. This indicates partial success of policies but highlights persistent pollution challenges.
- **Decline in NO_2 and CO:** Long-term reduction reflects better emission standards like BS-VI norms. It also shows impact of cleaner fuels and improved industrial regulations.
- **Rise in Ozone:** Ozone levels have increased significantly in recent years. This points to the

complexity of air pollution control in urban environments.

- **Regional Variation:** Cities like Meerut, Noida, and Ghaziabad show rising pollution trends. This indicates that pollution control must go beyond city-level interventions.

Urban Air Pollution and Governance Issues

- **Fragmented Governance:** Multiple agencies handle air quality, leading to coordination gaps. This reduces the effectiveness of pollution control measures.

- **Construction and Dust:** Rapid urbanisation increases dust pollution significantly. Lack of regulation and monitoring worsens PM10 levels.
- **Vehicular Emissions:** Increasing vehicle numbers contribute to pollution load. Though cleaner fuels help, total emissions remain high due to volume.
- **Policy Gaps:** Existing policies focus more on primary pollutants than secondary ones like ozone. This creates new challenges in air quality management.

Government Initiatives

- **National Clean Air Programme (NCAP):** Aims to reduce PM pollution levels by 20–30%. It focuses on city-specific action plans and monitoring systems.
- **BS-VI Norms:** Stricter emission standards for vehicles have reduced NO₂ and CO emissions. These norms align India with global best practices.
- **Graded Response Action Plan (GRAP):** Implements emergency measures during severe pollution. It includes restrictions on construction and vehicle use.
- **Air Quality Monitoring:** Expansion of monitoring stations improves data availability. This helps in better policy planning and real-time interventions.

Challenges Ahead

- **Rising Secondary Pollutants:** Ozone is difficult to control due to its formation process. It requires integrated reduction of precursor gases.
- **Regional Coordination:** Pollution spreads across state boundaries in NCR. This demands cooperative federalism and joint action plans.
- **Data and Awareness:** Lack of public awareness about ozone pollution remains a concern. Better communication strategies are needed for behavioural change.
- **Climate Linkages:** Air pollution and climate change are interconnected issues. Policies must address both simultaneously for long-term sustainability.

Way Forward

- **Integrated Pollution Control:** Address both primary and secondary pollutants together. This requires a multi-sectoral and scientific approach.
- **Regional Strategy:** Strengthen coordination among NCR states. A unified policy framework can improve effectiveness.
- **Technological Solutions:** Promote clean energy, electric vehicles, and dust control technologies. This will reduce overall pollution load.
- **Public Participation:** Increase awareness and citizen involvement. Behavioural changes can significantly contribute to pollution reduction.

Conclusion

Delhi's pollution profile is shifting from traditional pollutants to complex secondary pollutants like ozone. While progress has been made in reducing NO₂ and CO, rising ozone levels pose new challenges. A comprehensive and adaptive policy approach is essential to tackle evolving air pollution dynamics.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Which of the following pollutants is classified as a secondary pollutant?

- (a) Carbon monoxide
- (b) Nitrogen dioxide
- (c) Ozone
- (d) Sulphur dioxide

Answer: (c)

Descriptive Question

Q. "India's air pollution problem is shifting from primary pollutants to secondary pollutants like ozone." Examine the causes, implications, and policy challenges. (250 words)

Water Budgeting in Rural India

Why in News: A recent PIB article highlighted the growing importance of **participatory water budgeting** in rural India as a tool for addressing groundwater depletion, water scarcity, climate variability, and rising agricultural demand. Initiatives such as the **Atal Bhujal Yojana**, **National Water Mission**, and state-level programmes in Maharashtra and Rajasthan have demonstrated its effectiveness in promoting sustainable water governance.

Key Details

- **Growing Water Stress:** Rising population, increasing agricultural demand, declining groundwater levels, and climate change have intensified pressure on India's limited water resources.
- **Shift in Approach:** Policymakers are increasingly advocating a transition from a supply-oriented approach to a demand-based and community-driven model of water management.
- **Community Participation:** Water budgeting empowers local communities to assess water availability and plan its use for agriculture, domestic consumption, livestock, and other needs.
- **Technology Integration:** Digital platforms such as the **Varuni Web Application** are improving water planning through scientific and data-driven decision-making.

Water Scenario in India

- **Resource Availability:** According to the Central Water Commission, India receives about **3,880 BCM of annual precipitation**, but the utilisable annual water availability is estimated at around **1,999 BCM** after accounting for natural losses.
- **Declining Per Capita Availability:** Rapid population growth has significantly reduced per capita water availability, pushing several regions towards water stress and scarcity.
- **Agricultural Dependence:** Agriculture accounts for nearly **80–90% of water consumption in rural India**, making efficient water management essential for food security and rural livelihoods.

Water Budgeting

- **Meaning:** Water budgeting is the systematic assessment of water availability and demand within a defined area such as a village, watershed, block, or district to ensure sustainable utilisation of water resources.
- **Core Objective:** It compares water supply from rainfall, groundwater recharge, and surface sources with demand from agriculture, households, livestock, and industry to identify surplus and deficit situations.
- **Governance Tool:** It supports evidence-based planning and enables informed decisions regarding water allocation, conservation, and resource management.

Significance

- **Sustainable Utilisation:** Water budgeting promotes efficient use of available resources and prevents over-exploitation of groundwater and surface water sources.
- **Climate Resilience:** By accounting for rainfall variability and future water needs, it helps communities adapt to droughts, erratic monsoons, and climate-induced uncertainties.
- **Conflict Reduction:** Transparent assessment of water resources helps minimise disputes over water allocation among different users and sectors.
- **Local Empowerment:** Participatory water budgeting strengthens decentralised governance by involving Gram Panchayats and local communities in decision-making.

Agriculture

- **Crop Planning:** Water budgeting enables farmers to select crops based on local water availability, reducing the risk of crop failure and groundwater depletion.
- **Efficient Irrigation:** It promotes adoption of water-saving techniques such as drip irrigation, sprinkler systems, mulching, and crop diversification.
- **Food Security:** Better alignment between water resources and agricultural practices supports sustainable agricultural productivity and long-term food security.

Livestock

- **Integrated Planning:** Water budgeting incorporates the water requirements of livestock, fisheries, and allied sectors into local planning processes.
- **Rural Livelihoods:** Considering livestock water demand ensures balanced allocation and supports diversified income sources for rural households.
- **Resource Optimisation:** It helps prevent competition between agriculture, livestock, and domestic sectors for limited water resources.

Atal Bhujal Yojana

- **Overview:** Launched in 2019, the Atal Bhujal Yojana promotes community-led groundwater management in seven groundwater-stressed states through Gram Panchayat-level water budgeting.
- **Achievements:** As of March 2026, around **8,203 water budgets** have been prepared and nearly **81,700 water**

conservation and recharge structures have been created or restored.

- **Impact:** Assessment reports indicate measurable improvement in groundwater levels across a majority of participating blocks, highlighting the effectiveness of participatory groundwater governance.

Hiware Bazar Model

- **Community Success Story:** The drought-prone village of **Hiware Bazar in Maharashtra** transformed itself through watershed development, rainwater harvesting, groundwater recharge, and annual water budgeting.
- **Participatory Governance:** Water availability is assessed at the Gram Sabha level, and agricultural activities are planned accordingly to prevent over-extraction.
- **Policy Influence:** The model has inspired broader state-level initiatives aimed at creating water-secure villages across Maharashtra.

National Water Mission

- **Integrated Management:** The National Water Mission recognises water budgeting as a key component of **Integrated Water Resources Management (IWRM)**.
- **Women's Participation:** Initiatives such as **Nari Shakti se Jal Shakti** encourage women-led institutions, Self-Help Groups, and Water User Associations to actively participate in water governance.
- **Inclusive Development:** Community involvement improves ownership, accountability, and long-term sustainability of water conservation efforts.

Rajasthan Model

- **Mukhyamantri Jal Swavlamban Abhiyan:** Rajasthan has institutionalised water budgeting through village-level planning under its watershed-based water conservation programme.
- **Four Waters Concept:** The initiative focuses on conserving rainwater, groundwater, underground water, and soil moisture to improve water security.
- **Outcomes:** The programme has improved groundwater levels, enhanced agricultural productivity, and expanded water access for millions of people and livestock.

Technology

- **Varuni Application:** Developed under the Indo-German WASCA Project, the Varuni web application generates block-level water budgets using rainfall, land use, cropping pattern, population, and groundwater data.
- **Data-Driven Planning:** Automated assessments help local authorities identify water deficits, prioritise interventions, and improve resource allocation.
- **Digital Governance:** Technology enhances transparency, accuracy, and efficiency in local water management systems.

Challenges

- **Data Gaps:** Reliable and updated local-level data on groundwater recharge, consumption patterns, and rainfall remains inadequate in many regions.

- **Institutional Capacity:** Many Gram Panchayats lack technical expertise and trained personnel for preparing and implementing water budgets.
- **Behavioural Issues:** Farmers often continue cultivating water-intensive crops despite local water scarcity due to market incentives and traditional practices.
- **Climate Uncertainty:** Increasing frequency of droughts, floods, and erratic rainfall patterns complicates water planning and management.

Way Forward

- **Institutionalisation:** Water budgeting should be integrated into Gram Panchayat Development Plans (GPDs) and district planning frameworks.
- **Strengthening Capacity:** Training local institutions and community stakeholders is essential for effective implementation and monitoring.
- **Technology Adoption:** Wider use of GIS, remote sensing, AI-based forecasting, and digital platforms can improve water assessments and planning.
- **Crop Diversification:** Incentivising less water-intensive crops and micro-irrigation systems can significantly reduce agricultural water demand.
- **Community Ownership:** Greater involvement of local communities, women, and farmer groups is crucial for ensuring sustainable and equitable water governance.

Conclusion

Water security is emerging as one of the most critical development challenges facing India in the twenty-first century. In this context, water budgeting offers a practical and participatory framework for balancing water demand with available resources. Experiences from initiatives such as the Atal Bhujal Yojana, Hiware Bazar, Rajasthan's water conservation programmes, and digital tools like Varuni demonstrate that the convergence of community participation, scientific planning, and policy support can significantly enhance resilience against water stress. Institutionalising water budgeting across rural India will be vital for ensuring sustainable agriculture, climate resilience, and long-term water security.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. With reference to Water Budgeting, consider the following statements:

1. It involves assessing water availability and demand within a defined geographical area.
2. It is a key component of the Atal Bhujal Yojana.
3. It focuses only on agricultural water demand and excludes livestock requirements.

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)

Descriptive Question

Q. Water budgeting is increasingly being recognised as an effective tool for sustainable water governance in rural India. Discuss its significance in addressing groundwater depletion, agricultural sustainability, and climate resilience. (250 Words, 15 Marks)

Ecocide and International Law

Why in News: The term “**Ecocide**” has regained global attention following allegations of large-scale environmental destruction during conflicts in **Gaza, Southern Lebanon, and Ukraine**, along with concerns raised over attacks on critical energy infrastructure. These developments have renewed demands to recognise **Ecocide as the fifth international crime** under international law.

Key Details

- **Growing Debate:** Environmental groups and legal experts are advocating the recognition of ecocide as an international crime to address large-scale ecological destruction during both war and peacetime.
- **Legal Gap:** Existing international legal frameworks, including the Rome Statute, provide limited protection against environmental devastation due to high evidentiary thresholds and weak enforcement mechanisms.
- **Global Concern:** Increasing climate vulnerabilities, biodiversity loss, and environmentally destructive conflicts have strengthened calls for stronger international environmental accountability.

Understanding Ecocide

- **Meaning:** Ecocide refers to the extensive destruction, damage, or loss of ecosystems to such an extent that the peaceful enjoyment of the environment by present and future generations is severely diminished.
- **Origin:** The term was coined in 1970 by biologist **Arthur Galston** while describing the environmental devastation caused by the use of Agent Orange during the Vietnam War.
- **Modern Definition:** In 2021, an independent legal panel defined ecocide as unlawful or reckless acts committed with knowledge that they are likely to cause severe, widespread, or long-term environmental damage.

Evolution of the Concept

- **Global Recognition:** The concept first gained international attention during the **1972 Stockholm Conference on the Human Environment**, where environmental destruction was linked with global peace and security.
- **Domestic Adoption:** Countries such as France, Belgium, Russia, Ukraine, and Vietnam have incorporated ecocide-related provisions into their legal systems in varying forms.
- **Emerging Trend:** The growing climate crisis has transformed ecocide from an environmental issue into a broader question of international justice and sustainable development.

Ecocide and International Crimes

- **Current Framework:** The International Criminal Court (ICC) currently recognises four core international crimes: Genocide, Crimes against Humanity, War Crimes, and Aggression.
- **Demand for Fifth Crime:** Advocates argue that ecocide should be recognised as the fifth international crime because severe environmental destruction often has consequences comparable to humanitarian catastrophes.
- **Accountability Gap:** Unlike genocide or war crimes, large-scale ecological destruction often escapes direct criminal prosecution under international law.

Environmental Consequences of Conflict

- **Ecosystem Damage:** Modern warfare destroys forests, wetlands, agricultural land, and biodiversity-rich ecosystems, often causing irreversible ecological loss.
- **Pollution and Contamination:** Bombing of industrial facilities, oil depots, and energy infrastructure releases toxic substances into soil, air, and water systems.
- **Climate Impact:** Military activities contribute significantly to greenhouse gas emissions, increasing the environmental footprint of armed conflicts.
- **Long-Term Effects:** Environmental damage caused during conflicts can affect livelihoods, food security, public health, and economic recovery for decades.

Existing Legal Framework

- **Geneva Conventions:** Additional Protocol I (1977) prohibits methods of warfare expected to cause widespread, long-term, and severe environmental damage.
- **ENMOD Convention (1976):** It prohibits the hostile use of environmental modification techniques such as artificially inducing floods, earthquakes, or climatic disturbances.
- **Rome Statute (1998):** The ICC can prosecute environmental destruction only under limited war-crime provisions when specific legal conditions are met.

India's Position

- **No Separate Law:** India does not currently recognise ecocide as a distinct criminal offence and addresses environmental harm through various regulatory laws.
- **Constitutional Protection:** Articles 21, 48A, and 51A(g) collectively provide a constitutional basis for environmental protection and sustainable development.
- **Judicial Developments:** In **M.K. Ranjitsinh v. Union of India (2024)**, the Supreme Court recognised protection against adverse impacts of climate change as part of fundamental rights under Articles 14 and 21.
- **Role of NGT:** The National Green Tribunal frequently applies principles such as Polluter Pays and Sustainable Development to impose environmental compensation on violators.

Limitations of Existing Laws

- **Human-Centric Approach:** Current international law primarily protects the environment when environmental damage directly harms human populations rather than recognising nature as an independent entity.
- **High Legal Threshold:** The Rome Statute requires environmental damage to be simultaneously widespread, long-term, and severe, making successful prosecution extremely difficult.
- **War-Centric Scope:** Existing provisions mainly address environmental destruction during armed conflict and provide limited remedies for peacetime ecological disasters.
- **Jurisdictional Constraints:** The ICC can exercise jurisdiction only in limited circumstances, reducing its effectiveness in addressing environmental crimes globally.
- **Intent Requirement:** Proving deliberate intent to destroy the environment remains a major legal challenge in most cases.

Challenges in Recognition

- **Absence of Precedent:** No direct international prosecution for ecocide has yet been successfully completed, limiting legal clarity and enforcement.
- **Political Resistance:** Powerful states may oppose expanding international criminal law due to concerns regarding sovereignty and military operations.
- **Amendment Complexity:** Adding ecocide to the Rome Statute requires broad international consensus and extensive ratification by member states.
- **Enforcement Deficit:** International law often depends on voluntary compliance, making implementation difficult in politically sensitive situations.

Significance for Global Governance

- **Climate Justice:** Recognising ecocide would strengthen accountability for actions that accelerate climate change, biodiversity loss, and ecosystem collapse.
- **Preventive Deterrence:** Criminal liability could discourage governments and corporations from engaging in environmentally destructive activities.
- **Sustainable Development:** Stronger legal protection for ecosystems aligns with global commitments under the Sustainable Development Goals (SDGs) and international climate agreements.
- **Intergenerational Equity:** Ecocide recognition supports the principle that future generations have a right to a healthy and sustainable environment.

Way Forward

- **Recognise Ecocide Internationally:** The international community should consider incorporating ecocide as the fifth international crime under the Rome Statute.
- **Reform Legal Standards:** The threshold for environmental crimes should be simplified to make prosecution more practical and effective.

- **Promote Ecocentric Jurisprudence:** Legal systems should increasingly recognise the intrinsic value of nature beyond its utility to human beings.
- **Strengthen National Laws:** Countries should enact domestic legislation criminalising severe environmental destruction and ecological negligence.
- **Enhance Global Cooperation:** International institutions, environmental organisations, and states must work together to improve environmental governance and accountability.

Conclusion

The growing debate on ecocide reflects the evolving understanding that environmental destruction is not merely a regulatory issue but a threat to human survival, biodiversity, and global sustainability. While existing international laws provide limited protection, they remain inadequate to address large-scale ecological harm caused by state or non-state actors. Recognising ecocide as an international crime can strengthen environmental accountability, bridge critical legal gaps, and reinforce the principle that protecting nature is essential for achieving climate justice, sustainable development, and intergenerational equity.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. With reference to Ecocide, consider the following statements:

1. Ecocide is currently recognised as an international crime under the Rome Statute.
2. The ENMOD Convention prohibits the hostile use of environmental modification techniques.
3. India has enacted a separate law specifically criminalising ecocide.

Which of the statements given above is/are correct?

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

Answer: (a)

Descriptive Question

Q. Environmental destruction during armed conflicts has highlighted the limitations of existing international legal frameworks. Examine the concept of ecocide and discuss the challenges and significance of recognising it as an international crime. (250 Words, 15 Marks).

SO₂ Mitigation from Coal-Based Power Plants

Why in News: A recent study by IIT Delhi, published in *Nature*, has estimated that India could prevent over **1.24 lakh premature deaths annually** by fully controlling **Sulphur Dioxide (SO₂)** emissions from **Coal-Fired Power Plants (CFPPs)**. The findings have reignited the debate over the implementation of emission-control technologies such as **Flue Gas Desulphurisation (FGD)** in thermal power plants.

Key Details

- **Public Health Concern:** The study highlights that uncontrolled SO₂ emissions from coal-based power plants contribute significantly to air pollution and are linked to cardiovascular, respiratory, and other pollution-related diseases.
- **Rising Emissions:** While many countries have witnessed declining SO₂ emissions, India's emissions from coal-fired power plants have increased substantially over the last two decades due to continued dependence on coal for electricity generation.
- **Policy Debate:** The issue has gained importance following the relaxation of emission norms for a large number of coal-based power units, raising concerns regarding the balance between environmental protection and energy affordability.

Context

- **Coal Dependency:** Coal remains the backbone of India's electricity sector, contributing nearly 70% of total power generation. While it supports energy security and industrial growth, it is also a major source of air pollution and greenhouse gas emissions.
- **Development Dilemma:** India faces the challenge of meeting rising energy demand while simultaneously improving air quality and achieving its climate commitments under global environmental agreements.

Sulphur Dioxide

- **Nature:** Sulphur Dioxide (SO₂) is a colourless gas released mainly from the burning of sulphur-containing fossil fuels such as coal and oil.
- **Environmental Impact:** It contributes to acid rain, ecosystem degradation, reduced visibility, and deterioration of buildings and monuments.
- **Health Impact:** Long-term exposure can aggravate asthma, respiratory disorders, cardiovascular diseases, and increase the risk of premature mortality.

PM2.5 Linkage

- **Secondary Pollutant Formation:** SO₂ does not remain confined to its original form in the atmosphere. It reacts with other compounds to form **Secondary Inorganic Aerosols**, including sulphates, which are major contributors to PM2.5 pollution.
- **Air Quality Impact:** PM2.5 particles can penetrate deep into the lungs and bloodstream, making them one of the most harmful forms of air pollution.

Inequality

- **Environmental Justice:** The study reveals that pollution impacts are not distributed equally. Socially and economically vulnerable groups often face greater exposure to polluted environments.
- **Disproportionate Burden:** Scheduled Castes (SCs), Scheduled Tribes (STs), Other Backward Classes (OBCs), and low-income communities frequently reside in areas more affected by industrial and power plant pollution.

- **Governance Perspective:** The issue highlights the intersection of environmental protection, public health, and social justice.

FGD Technology

- **Meaning:** Flue Gas Desulphurisation (FGD) is a pollution-control technology used to remove SO₂ from exhaust gases before they are released into the atmosphere.
- **Working Principle:** The process uses alkaline substances such as limestone or lime to chemically absorb and neutralise sulphur dioxide present in flue gases.
- **Outcome:** FGD systems can remove more than 90% of SO₂ emissions, significantly improving air quality around thermal power plants.

Process

- **Absorption Mechanism:** Exhaust gases pass through a scrubber where a limestone slurry reacts with sulphur dioxide, converting it into calcium sulphite.
- **Gypsum Production:** Further oxidation produces gypsum, a commercially useful by-product used in cement, plasterboards, and construction materials.
- **Circular Economy:** The utilisation of gypsum demonstrates how pollution-control technologies can simultaneously support resource efficiency and waste utilisation.

Significance

- **Public Health Benefits:** Reduction in SO₂ emissions can significantly lower disease burden, healthcare costs, and pollution-related mortality.
- **Environmental Gains:** Improved air quality contributes to healthier ecosystems, lower acid deposition, and reduced environmental degradation.
- **Economic Benefits:** Long-term gains from reduced healthcare expenditure and improved labour productivity may outweigh the initial cost of installing pollution-control systems.
- **Sustainable Development:** Effective emission control aligns with the goals of sustainable industrialisation and inclusive development.

Challenges

- **High Installation Costs:** Power producers argue that FGD systems involve substantial capital expenditure, potentially increasing electricity generation costs.
- **Operational Constraints:** Installation requires technical modifications, additional water usage, and periodic maintenance.
- **Energy Security Concerns:** Policymakers often face the challenge of balancing environmental regulations with affordable and reliable power supply.
- **Implementation Delays:** Several thermal power plants have failed to meet prescribed deadlines for installing FGD systems.

Policy Framework

- **Emission Standards:** The Ministry of Environment, Forest and Climate Change (MoEFCC) notified stricter

emission norms for thermal power plants in 2015 to control pollutants such as SO₂, NO_x, and particulate matter.

- **Recent Relaxation:** Subsequent policy revisions exempted a large number of coal-based units from mandatory FGD installation, triggering debate among environmental experts and public health researchers.
- **Governance Challenge:** The issue reflects the broader challenge of balancing economic growth, environmental sustainability, and public health objectives.

Way Forward

- **Strict Enforcement:** Emission standards should be implemented effectively, particularly in pollution hotspots and densely populated regions.
- **Targeted Prioritisation:** Older and highly polluting power plants should be prioritised for pollution-control interventions.
- **Technology Adoption:** Wider deployment of FGD systems and cleaner industrial technologies can significantly reduce pollution levels.
- **Energy Transition:** Accelerating renewable energy adoption can gradually reduce dependence on coal-based power generation.
- **Integrated Approach:** Cleaner cooking fuels, electric mobility, improved urban planning, and stronger monitoring systems should complement industrial emission control measures.

Conclusion

The debate over SO₂ mitigation highlights the broader challenge of reconciling India's developmental needs with environmental sustainability. While coal-based power generation remains essential for energy security, the associated public health and environmental costs cannot be ignored. Technologies such as Flue Gas Desulphurisation offer a viable pathway to reduce pollution without compromising electricity generation. In the long run, a balanced strategy combining strict emission standards, cleaner technologies, and a gradual transition towards renewable energy will be crucial for achieving sustainable development, improved public health, and environmental justice.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Flue Gas Desulphurisation (FGD):

1. It is used to remove Sulphur Dioxide emissions from thermal power plant exhaust gases.
2. Limestone is commonly used in the FGD process.
3. Gypsum is generated as a useful by-product in wet FGD systems.

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: (d)

Descriptive Question

Q. Coal-based thermal power plants remain central to India's energy security, but they also contribute significantly to air pollution. Discuss the significance of SO₂ mitigation measures such as Flue Gas Desulphurisation (FGD) in achieving sustainable development and environmental justice. (250 Words, 15 Marks)

India's Abstention on UNGA Climate Resolution

Why in News: India recently **abstained from voting** on a United Nations General Assembly (UNGA) resolution based on the **International Court of Justice (ICJ) Advisory Opinion on Climate Change**. While the resolution was adopted by an overwhelming majority, India raised concerns regarding climate equity, climate finance, and the preservation of the existing global climate governance framework.

Key Details

- **UNGA Resolution:** The resolution, initiated by **Vanuatu**, was adopted with **141 votes in favour**, 8 against, and 28 abstentions, including India.
- **ICJ Opinion:** The advisory opinion stated that countries have legal obligations to address human-induced climate change and protect the environment for present and future generations.
- **India's Position:** India supported global climate action but expressed reservations about the resolution's implications for developing countries and existing international climate agreements.

Background

- **Climate Governance Framework:** Global climate action is primarily guided by the **United Nations Framework Convention on Climate Change (UNFCCC)**, the **Kyoto Protocol**, and the **Paris Agreement**.
- **Nationally Determined Contributions (NDCs):** Under the Paris Agreement, countries voluntarily submit climate action plans based on their national circumstances and developmental priorities.
- **Bottom-Up Approach:** Unlike legally imposed targets, the Paris Agreement follows a flexible and nationally driven framework for achieving climate goals.

ICJ Opinion

- **Legal Interpretation:** The ICJ observed that states have a responsibility to prevent environmental harm and take effective measures against climate change.
- **Due Diligence Principle:** The Court emphasised that climate commitments should reflect the highest possible ambition and be implemented through effective domestic actions.

- **Global Significance:** Though non-binding, the opinion may influence future climate negotiations, domestic climate litigation, and the evolution of international environmental law.

Concerns

- **Judicial Expansion:** India expressed concern that the resolution could indirectly elevate a non-binding advisory opinion into a quasi-binding international obligation.
- **Policy Space:** Excessive judicial interpretation may reduce the flexibility available to developing countries in designing climate policies suited to their developmental needs.
- **Sovereignty Issues:** India maintained that climate obligations should emerge through multilateral negotiations rather than judicial pronouncements.

UNFCCC

- **Established Framework:** India reaffirmed that climate commitments should continue to be governed by the principles and mechanisms agreed upon under the UNFCCC process.
- **Consensus-Based Approach:** International climate obligations must be determined through consensus among member states rather than external legal interpretations.
- **Multilateralism:** Preserving the integrity of negotiated agreements remains crucial for maintaining trust in global climate governance.

NDCs

- **National Ownership:** India argued that Nationally Determined Contributions are voluntary commitments shaped by national priorities, capacities, and developmental requirements.
- **Flexibility Principle:** Subjecting NDCs to external legal scrutiny could undermine the foundational architecture of the Paris Agreement.
- **Development Concerns:** Developing countries require policy flexibility to balance climate action with economic growth and poverty reduction.

Finance

- **Climate Justice:** India highlighted the absence of adequate emphasis on climate finance within the resolution despite its central role in global climate action.
- **Developed Country Obligations:** Under international climate agreements, developed nations are expected to provide financial resources, technology transfer, and capacity-building support to developing countries.
- **Implementation Gap:** Without predictable financial assistance, climate commitments may become difficult for developing economies to achieve.

Equity

- **CBDR-RC Principle:** India reiterated the principle of **Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC)**, a cornerstone of international climate negotiations.

- **Historical Responsibility:** Developed countries have contributed disproportionately to historical greenhouse gas emissions and therefore bear greater responsibility for mitigation efforts.
- **Fair Transition:** Climate action should not impose disproportionate burdens on developing countries that are still pursuing economic development and poverty eradication.

Just Transition

- **Balancing Development and Sustainability:** India emphasised that energy transitions must be gradual, inclusive, and aligned with national development priorities.
- **Socio-Economic Considerations:** Abrupt transitions may adversely affect employment, industrial growth, and energy access in developing economies.
- **Global South Perspective:** Climate policies must accommodate the developmental aspirations of emerging economies while advancing environmental goals.

Diplomacy

- **Strategic Abstention:** India chose to abstain rather than oppose the resolution, reflecting a balanced diplomatic approach.
- **Support for Vulnerable Nations:** The abstention signalled India's continued solidarity with **Small Island Developing States (SIDS)** that face existential threats from rising sea levels and climate-related disasters.
- **Bridge Builder Role:** India's stance reflects its attempt to balance climate justice concerns with support for international climate cooperation.

Significance for India

- **Climate Leadership:** India remains committed to climate action through initiatives such as renewable energy expansion, green hydrogen development, and its updated NDC targets.
- **Developmental Priorities:** The abstention underscores India's effort to safeguard developmental interests while contributing to global climate solutions.
- **Global South Voice:** India's position reinforces its role as a leading advocate for equity, climate finance, and sustainable development in international forums.

Way Forward

- **Strengthening Climate Finance:** Developed countries must fulfil commitments relating to climate finance, technology transfer, and capacity building.
- **Preserving Equity:** International climate negotiations should continue to uphold CBDR-RC and climate justice principles.
- **Enhancing Cooperation:** Greater collaboration between developed and developing countries is essential for achieving global climate goals.
- **Promoting Inclusive Transition:** Climate policies should support economic growth, energy security, and poverty alleviation alongside environmental sustainability.

Conclusion

India's abstention on the UNGA climate resolution reflects a nuanced approach that supports global climate action while safeguarding the principles of equity, climate justice, and national policy autonomy. The episode highlights the continuing debate between legal accountability and negotiated multilateralism in climate governance. As climate challenges intensify, balancing environmental responsibility with developmental needs will remain central to India's climate diplomacy and the broader aspirations of the Global South.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the principle of Common But Differentiated Responsibilities and Respective Capabilities (CBDR-RC):

1. It recognises that all countries share responsibility for addressing climate change.
2. It acknowledges that developed countries bear greater responsibility due to historical emissions.
3. It forms one of the guiding principles of the UNFCCC.

Which of the statements given above are correct?

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

Answer: (c)

Descriptive Question

Q. India's abstention on the recent UNGA climate resolution reflects broader concerns regarding climate justice and global climate governance. Discuss in the context of the principles of CBDR-RC, climate finance, and the Paris Agreement framework. (15 Marks, 250 Words).

Illegal Sand Mining in National Chambal Sanctuary

Why in News: The **Supreme Court** recently expressed serious concern over illegal sand mining in the **National Chambal Sanctuary** and directed the governments of **Uttar Pradesh, Madhya Pradesh, and Rajasthan** to take stringent action. The Court observed that unchecked mining is damaging the Chambal River ecosystem and threatening endangered species such as the **Gharial** and the **Gangetic River Dolphin**.

Key Details

- **Judicial Concern:** The Supreme Court highlighted that illegal sand extraction is causing irreversible ecological damage and undermining conservation efforts in one of India's most important riverine ecosystems.
- **Biodiversity Threat:** Excessive mining has disturbed nesting sites, breeding grounds, and aquatic habitats of

several endangered species, particularly the Gharial and Gangetic River Dolphin.

- **Governance Challenge:** The issue reflects broader concerns regarding environmental governance, enforcement deficits, and the growing influence of illegal mining networks across India.
- **Development-Environment Debate:** The case highlights the challenge of balancing infrastructure development needs with ecological sustainability and biodiversity conservation.

Understanding Sand Mining

- **Definition:** Sand mining refers to the extraction of sand and gravel from riverbeds, floodplains, coastal areas, and other natural deposits, primarily for construction and infrastructure activities.
- **Economic Importance:** Sand is a critical raw material for housing, roads, bridges, and urban development. Rapid urbanisation and infrastructure expansion have significantly increased demand for construction-grade sand.
- **Environmental Concern:** Mining beyond natural replenishment levels disrupts river dynamics, damages ecosystems, and threatens long-term environmental sustainability.

Drivers

- **Rising Demand:** Rapid urbanisation, smart cities, industrial corridors, highways, and housing projects have led to an unprecedented demand for sand across the country.
- **Economic Incentives:** Illegal mining remains highly profitable as operators often bypass environmental clearances, royalty payments, and regulatory requirements.
- **Governance Deficits:** Weak enforcement, inadequate monitoring mechanisms, and alleged collusion between local officials, political actors, and mining mafias facilitate illegal operations.
- **Policy Gaps:** Inaccurate District Survey Reports (DSRs), inadequate replenishment studies, and limited adoption of alternatives such as Manufactured Sand (M-Sand) contribute to unsustainable extraction.

Ecological Impact

- **Habitat Destruction:** Excessive sand extraction destroys riverbanks, nesting grounds, spawning areas, and aquatic habitats essential for the survival of many species.
- **Biodiversity Loss:** River-dependent species such as gharials, dolphins, turtles, and migratory birds face increasing threats due to habitat degradation and ecological disturbance.
- **River Degradation:** Mining alters the natural structure of rivers, affecting sediment balance, channel stability, and ecological processes.
- **Wetland Stress:** Associated wetlands and floodplain ecosystems may shrink or degrade, reducing their ecological and hydrological functions.

Hydrological Impact

- **Riverbed Deepening:** Continuous removal of sand lowers riverbeds and changes natural water flow patterns.
- **Groundwater Decline:** Sand acts as a natural aquifer. Excessive extraction reduces groundwater recharge and lowers water tables in surrounding areas.
- **Flood Vulnerability:** Altered River channels can increase flood risks in some areas while reducing water availability in others.
- **Water Security:** Long-term degradation of river systems directly affects agriculture, drinking water supply, and ecosystem services.

Infrastructure Impact

- **Structural Damage:** Unscientific mining weakens the foundations of bridges, embankments, roads, and other public infrastructure.
- **Economic Costs:** Damage to infrastructure increases maintenance expenditure and creates long-term financial burdens for governments.
- **Safety Risks:** Excessive riverbed excavation can undermine structural stability and pose risks to nearby communities.

Chambal Sanctuary

- **Protected Landscape:** The National Chambal Sanctuary is a tri-state protected area spread across Rajasthan, Madhya Pradesh, and Uttar Pradesh along the Chambal River.
- **Conservation Importance:** Established in 1978–79, it covers approximately 5,400 sq. km and represents one of India's most significant freshwater conservation landscapes.
- **Unique Ecosystem:** The sanctuary is characterised by clean river waters, ravines, sandy banks, and rich aquatic biodiversity.
- **Flagship Species:** It serves as a crucial habitat for Gharials, Gangetic River Dolphins, Muggers, Crocodiles, Red-Crowned Roofed Turtles, and Indian Skimmers.

Gharial

- **Species Profile:** The Gharial (*Gavialis gangeticus*) is a fish-eating crocodylian endemic to the Indian subcontinent and is considered a key indicator of healthy river ecosystems.
- **Conservation Status:** It is listed as **Critically Endangered** on the IUCN Red List and receives the highest legal protection under **Schedule I of the Wildlife (Protection) Act, 1972**.
- **Habitat Dependence:** Gharials require deep rivers and undisturbed sandy banks for basking and nesting, making them highly vulnerable to sand mining activities.

Dolphin

- **National Aquatic Animal:** The Gangetic River Dolphin (*Platanista gangetica*), popularly known as "Susu", is India's National Aquatic Animal.

- **Conservation Status:** It is classified as **Endangered** by the IUCN and is protected under **Schedule I of the Wildlife (Protection) Act, 1972.**
- **Ecological Indicator:** As a top freshwater predator, the dolphin serves as an indicator of river health and ecological integrity.
- **Threat Perception:** Habitat fragmentation, pollution, reduced water flow, and mining-induced disturbances threaten its survival.

Legal Framework

- **MMDR Act, 1957:** Sand is classified as a minor mineral, making its regulation primarily a responsibility of state governments.
- **EIA Notification, 2006:** Environmental clearance is mandatory for sand mining projects to assess and mitigate ecological impacts.
- **Sustainable Sand Mining Management Guidelines, 2016:** These guidelines promote scientific mining based on replenishment studies and District Survey Reports.
- **Enforcement and Monitoring Guidelines, 2020:** The framework emphasises technological monitoring through drones, satellite imagery, GPS tracking, and digital permits.

Judicial Intervention

- **Deepak Kumar Case (2012):** The Supreme Court mandated environmental clearance for all sand mining activities, including small-scale mining operations, recognising their cumulative environmental impact.
- **Gaurav Kumar Case (2025):** The Court established the principle of "**No District Survey Report, No Sand Mining**", making scientifically prepared DSRs mandatory for granting environmental clearance.
- **Public Trust Doctrine:** The judiciary has consistently held that natural resources belong to the people and the State acts merely as a trustee responsible for their protection.
- **Precautionary Principle:** Courts have emphasised that lack of complete scientific certainty cannot justify delaying measures to prevent environmental degradation.

Challenges

- **Sand Mafia Networks:** Organised illegal mining groups often possess significant economic and political influence, making enforcement difficult.
- **Monitoring Constraints:** Large river systems and limited administrative capacity hinder effective surveillance and regulation.
- **Policy Implementation Gap:** Existing regulations are often weakened by poor enforcement and inadequate inter-state coordination.
- **Development Pressures:** Increasing demand from infrastructure and housing sectors continues to drive illegal extraction.

Way Forward

- **Technology-Driven Monitoring:** Greater use of drones, satellite imagery, GIS mapping, GPS-enabled transport

monitoring, and digital dashboards can improve transparency and enforcement.

- **Scientific Mining:** District Survey Reports should be based on annual replenishment studies, carrying-capacity assessments, and scientific extraction limits.
- **Promotion of M-Sand:** Encouraging the production and use of Manufactured Sand (M-Sand) can reduce pressure on river ecosystems while supporting sustainable construction.
- **Institutional Reforms:** Dedicated anti-illegal mining task forces, stronger inter-state coordination, and accountability mechanisms are needed to break the nexus between illegal operators and local authorities.
- **Community Participation:** Empowering local communities through river conservation committees and social audits can strengthen grassroots monitoring and conservation efforts.
- **River-Centric Governance:** Sand should be treated not merely as a mineral resource but as an integral component of river ecosystems and water security.

Conclusion

The issue of illegal sand mining in the National Chambal Sanctuary reflects the broader challenge of balancing economic development with environmental sustainability. While sand remains indispensable for infrastructure growth, indiscriminate extraction threatens river ecology, biodiversity, groundwater security, and public infrastructure. Protecting flagship species such as the Gharial and Gangetic River Dolphin requires a combination of strong governance, scientific resource management, technological monitoring, and community participation. A sustainable approach to sand mining is essential not only for biodiversity conservation but also for ensuring long-term ecological security and water resilience in India.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the National Chambal Sanctuary:

1. It is spread across Rajasthan, Madhya Pradesh, and Uttar Pradesh.
2. It is an important habitat for both the Gharial and Gangetic River Dolphin.
3. The Gharial is listed as Endangered under the IUCN Red List.

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

Answer: (a)

Descriptive Question

Q. Illegal sand mining has emerged as a major environmental governance challenge in India. Discuss its ecological, hydrological, and socio-economic impacts. Suggest measures for ensuring sustainable sand mining while protecting river ecosystems. (15 Marks, 250 Words).

World Metrology Day 2026

Why in News: World Metrology Day was observed on **20 May 2026** to commemorate the signing of the **Metre Convention (1875)** in Paris. The theme for 2026, **“Metrology: Building Trust in Policy Making,”** highlights the growing role of accurate measurements in governance, trade, healthcare, environmental monitoring, and technological advancement.

Key Details

- **Global Significance:** World Metrology Day celebrates international cooperation in establishing uniform measurement standards, which form the foundation of science, industry, commerce, and public administration.
- **2026 Theme:** The theme emphasizes that evidence-based policymaking depends upon reliable measurements for sectors such as climate action, healthcare, energy security, and economic planning.
- **India's Growing Role:** India has emerged as a significant player in global metrology through legal reforms, digital initiatives, and international certification capabilities.

Understanding Metrology

- **Meaning:** Metrology is the science of measurement that ensures accuracy, uniformity, and reliability in determining physical quantities such as length, mass, time, temperature, and volume.
- **Importance:** Every modern activity—from scientific research and industrial production to medical diagnosis and digital transactions—depends upon precise measurement systems.
- **Governance Relevance:** Reliable measurements strengthen policymaking by enabling accurate data collection, monitoring, and evaluation of government programmes.

Metre Convention

- **Historical Milestone:** Signed in **1875**, the Metre Convention established an international framework for standardizing measurements across nations.
- **Global Standardisation:** It laid the foundation for the **International System of Units (SI)**, ensuring uniform measurements in science, trade, and industry worldwide.
- **Contemporary Relevance:** The convention remains one of the earliest examples of successful international scientific cooperation.

Legal Metrology

- **Consumer Protection:** Legal metrology regulates weighing and measuring instruments used in trade to ensure fairness and prevent consumer exploitation.
- **Market Transparency:** Accurate measurements protect consumers from underweight products, fuel fraud, incorrect utility billing, and misleading commercial practices.

- **Ease of Doing Business:** Standardized measurement systems reduce trade disputes and facilitate smoother commercial transactions.

India's Measurement Legacy

- **Ancient Excellence:** The Indus Valley Civilization demonstrated remarkable precision through standardized weights, scales, and measurement systems used in urban planning and trade.
- **Administrative Utility:** During the Mauryan period, standardized weights and measures supported taxation, governance, and economic administration.
- **Commercial Traditions:** Units such as Rati, Masha, Tola, Seer, and Maund played an important role in India's historical trade and market systems.

Institutional Evolution

- **National Physical Laboratory (NPL):** Established in 1947, NPL serves as India's apex institution for maintaining national measurement standards.
- **Metric Adoption:** India adopted the International System of Units (SI) after signing the Metre Convention, ensuring compatibility with global scientific and trade practices.
- **Capacity Building:** Institutions such as the Indian Institute of Legal Metrology have strengthened professional expertise in measurement science and regulation.

Legal Reforms

- **Legal Metrology Act, 2009:** The Act provides the statutory framework for standardized measurements and mandatory declarations on packaged commodities.
- **Consumer Rights:** It empowers authorities to conduct inspections, enforce compliance, and safeguard consumers against unfair trade practices.
- **Regulatory Modernisation:** Recent amendments have focused on balancing consumer protection with ease of doing business.

Digital Transformation

- **eMaap Portal:** The portal integrates legal metrology systems across states and provides a transparent online platform for registration and compliance.
- **Administrative Efficiency:** Digital integration reduces paperwork, improves transparency, and enhances service delivery to businesses.
- **Governance Innovation:** The initiative reflects India's broader digital governance strategy aimed at simplifying regulatory processes.

One Nation, One Time

- **Standardised Time Infrastructure:** This initiative aims to disseminate Indian Standard Time (IST) with millisecond and microsecond accuracy across sectors.
- **Strategic Importance:** Accurate time synchronization is essential for telecommunications, financial transactions, power grids, artificial intelligence, cybersecurity, and digital governance.

- **Future Readiness:** As India advances toward a digital economy, precision timing infrastructure becomes increasingly important.

Global Recognition

- **OIML Certification:** India became the 13th country authorized to issue internationally accepted OIML certification for measuring instruments.
- **Export Competitiveness:** Indian manufacturers can now access global markets without undergoing repeated testing in multiple countries.
- **International Leadership:** India is set to host the **61st Meeting of the International Committee of Legal Metrology** in 2026, reflecting its growing global stature.

Sustainable Development

- **Evidence-Based Development:** Accurate measurement systems support effective implementation and monitoring of developmental programmes.
- **SDG Linkages:** Metrology contributes directly to goals related to poverty reduction, healthcare, clean energy, industrial innovation, and climate action.
- **Climate Governance:** Reliable environmental measurements are crucial for monitoring emissions, pollution levels, and climate-related indicators.

National Physical Laboratory (NPL)

- **Scientific Leadership:** NPL is the custodian of India's national measurement standards and plays a crucial role in advancing metrology research.
- **Innovation Contributions:** It developed the indelible ink used in elections and established facilities for environmental monitoring, solar cell calibration, and advanced materials research.
- **Regional Cooperation:** NPL has also contributed to strengthening metrology cooperation across the Asia-Pacific region.

Challenges

- **Awareness Deficit:** Public understanding of metrology remains limited despite its widespread impact on daily life and economic activities.
- **Technological Upgradation:** Rapid advances in digital technologies require continuous modernization of measurement standards and infrastructure.
- **Implementation Gaps:** Uniform enforcement of legal metrology regulations remains a challenge across states and sectors.
- **Emerging Technologies:** Artificial intelligence, quantum technologies, and digital trade demand increasingly sophisticated measurement and calibration systems.

Significance

- **Governance:** Metrology strengthens evidence-based policymaking, regulatory effectiveness, and public service delivery.
- **Economy:** Standardized measurements facilitate trade, industrial competitiveness, and ease of doing business.

- **Science & Technology:** Precision measurement forms the foundation of emerging technologies such as semiconductors, quantum computing, space research, and advanced manufacturing.
- **Consumer Protection:** Legal metrology directly supports consumer rights, transparency, and fair market practices.

Way Forward

- **Strengthen Measurement Infrastructure:** India must continue investing in advanced laboratories, calibration facilities, and digital measurement systems.
- **Promote Industry Integration:** Greater adoption of international measurement standards can enhance manufacturing quality and export competitiveness.
- **Leverage Emerging Technologies:** Integration of artificial intelligence, automation, and digital technologies can improve precision and efficiency.
- **Enhance Public Awareness:** Consumer education and industry outreach programmes can strengthen compliance and trust in measurement systems.

Conclusion

Metrology is often invisible in daily life, yet it forms the backbone of modern governance, scientific progress, economic development, and consumer protection. From ancient India's sophisticated measurement systems to contemporary initiatives such as the eMaap Portal and One Nation, One Time, the evolution of India's metrology ecosystem reflects its growing commitment to precision, transparency, and global competitiveness. As policymaking becomes increasingly data-driven and technology-intensive, robust measurement infrastructure will be indispensable for achieving sustainable development, strengthening public trust, and supporting India's aspirations as a leading knowledge and innovation-driven economy.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Metrology:

1. Metrology is the science of measurement.
2. Legal Metrology deals with regulations related to measuring instruments used in trade and commerce.
3. The International Organization of Legal Metrology (OIML) is recognized under the WTO Technical Barriers to Trade Agreement.

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: (d)

Descriptive Question

Q. "Accurate measurement systems are essential for good governance, economic growth, and technological advancement." In this context, examine the significance of metrology in India's development journey and discuss

recent initiatives undertaken to strengthen the country's metrology ecosystem. (15 Marks, 250 Words).

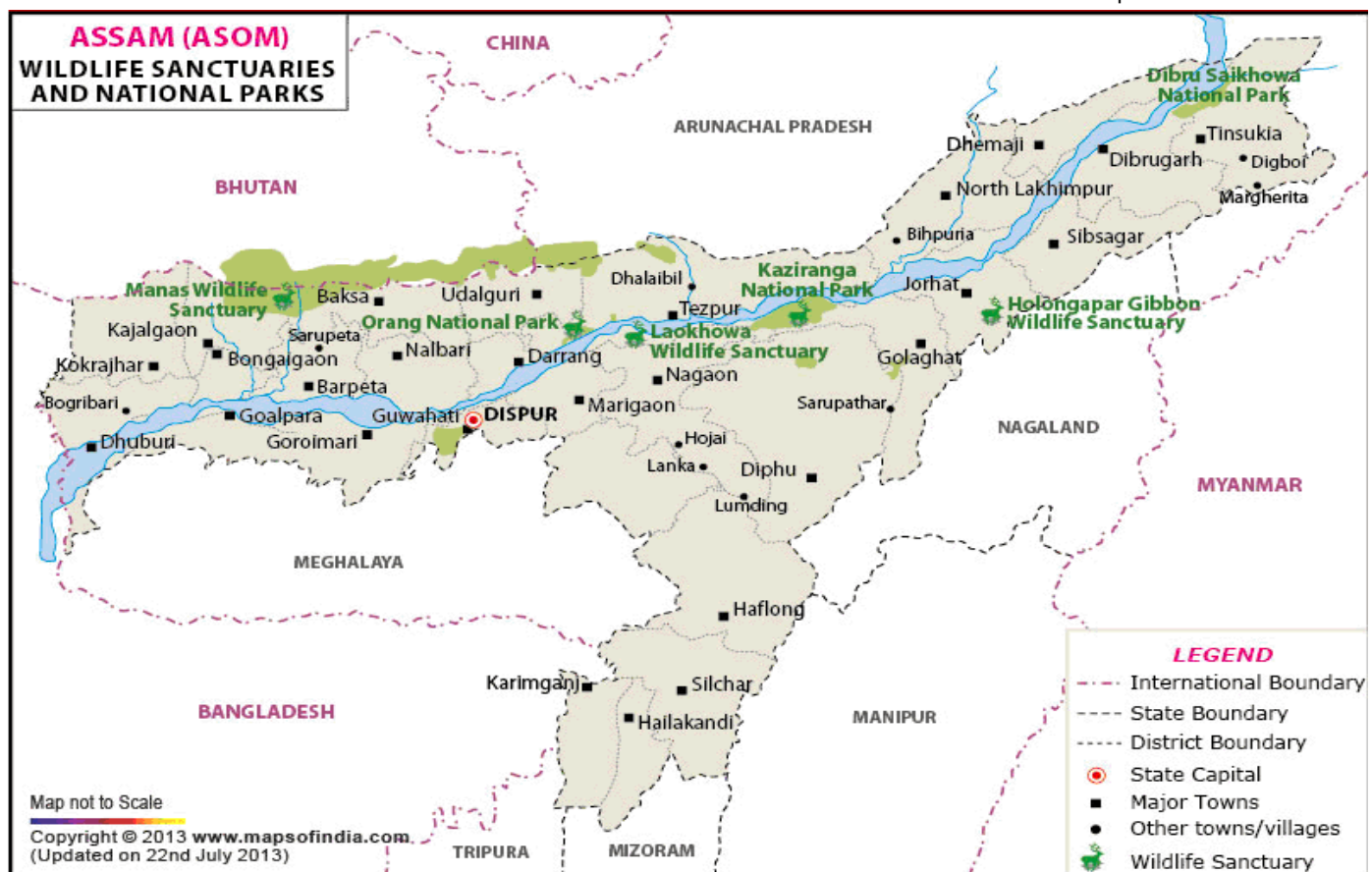
Kaziranga National Park

Why in News: An environmental activist recently approached the **Central Empowered Committee (CEC)** regarding alleged illegal constructions in wildlife corridors connecting **Kaziranga National Park** and the **Karbi Anglong Hills** in Assam.

Key Details

- **Location:** Situated in Assam along the southern bank of the **Brahmaputra River**.

- **Establishment:** Declared a **Reserve Forest (1908)**, **Wildlife Sanctuary (1950)**, **National Park (1974)**, and **UNESCO World Heritage Site (1985)**.
- **Tiger Reserve:** Declared a **Tiger Reserve in 2007** due to its high tiger density.
- **Famous For:** Hosts the **Big Five of Kaziranga – One-Horned Rhinoceros, Royal Bengal Tiger, Asian Elephant, Wild Water Buffalo, and Eastern Swamp Deer**.
- **Eastern Swamp Deer:** Nearly the entire global population of the **Eastern Swamp Deer (Barasingha)** is found in Kaziranga.
- **Rivers:** The **Diphlu River** flows through the park, while the **Brahmaputra River** shapes its ecosystem through annual floods and sediment deposition.



Wildlife Corridors

- **Purpose:** Wildlife corridors connect Kaziranga with the **Karbi Anglong Hills**, enabling safe seasonal migration of animals, particularly during Brahmaputra floods.
- **Threat:** Expansion of infrastructure, especially **National Highway-37**, has fragmented habitats and increased human-wildlife conflict.
- **Legal Protection:** In 2019, the Supreme Court prohibited new construction within identified wildlife corridors; Assam officially notified **nine wildlife corridors in 2022**.

India's Invasive Species Crisis

Why in News: Growing campaigns against invasive alien species such as **Prosopis juliflora**, **Lantana camara**, and **Senna spectabilis** have renewed focus on their ecological and economic impacts. Experts emphasize that removal

alone is insufficient unless the underlying causes of invasion are addressed.

Key Details

- **Ecological Threat:** Invasive alien species (IAS) are among the leading drivers of biodiversity loss globally and pose a significant challenge to ecosystem restoration in India.
- **Economic Impact:** A recent study estimated that invasive species have caused economic losses exceeding ₹8 lakh crore in India over the past six decades through damage to agriculture, fisheries, forests, and water resources.
- **Policy Relevance:** The issue is directly linked to biodiversity conservation, climate resilience, sustainable development, and ecosystem management.

Invasive Alien Species

- **Meaning:** Invasive Alien Species are non-native plants, animals, or microorganisms introduced outside their natural range that establish, spread rapidly, and cause ecological, economic, or social harm.
- **Examples in India:** Major invasive species include **Lantana camara**, **Prosopis juliflora (Vilayati Babul)**, **Parthenium hysterophorus (Congress Grass)**, **Water Hyacinth**, and **Senna spectabilis**.
- **Causes**
- **Colonial Legacy:** Several invasive species were intentionally introduced during the colonial period for forestry, ornamental, or land reclamation purposes and later spread uncontrollably.
- **Habitat Disturbance:** Deforestation, mining, infrastructure projects, urbanisation, and habitat fragmentation create disturbed ecosystems that are easily colonised by invasive species.
- **Agricultural Changes:** Excessive fertilizer use, irrigation expansion, and altered land-use patterns often favour invasive plants over native species.
- **Globalisation:** International trade, transportation networks, contaminated imports, and ballast water discharge facilitate the introduction of new invasive species.

Impacts

- **Biodiversity Loss:** Invasive species outcompete native flora and fauna, reduce habitat quality, and contribute significantly to species decline and ecosystem degradation.
- **Agricultural Damage:** Species such as Parthenium and invasive pests reduce crop productivity, increase management costs, and threaten food security.
- **Water Resources:** Water hyacinth blocks waterways, reduces oxygen levels in water bodies, and adversely affects fisheries and irrigation systems.
- **Human Health:** Certain invasive plants cause allergies, respiratory disorders, skin diseases, and create favourable conditions for disease vectors.
- **Human-Wildlife Conflict:** Degradation of natural habitats and forage availability often pushes wildlife into human settlements, increasing conflicts.

Significance

- **Environmental Security:** Invasive species undermine ecosystem stability, ecological balance, and long-term environmental sustainability.
- **Climate Linkage:** Degraded ecosystems become less resilient to climate change, droughts, floods, and other environmental stresses.
- **Development Challenge:** Managing invasive species is essential for achieving biodiversity conservation and sustainable development goals.

Initiatives

- **Convention on Biological Diversity (CBD):** Calls upon countries to prevent, control, and eradicate invasive alien species.

- **Kunming-Montreal Global Biodiversity Framework:** Target 6 aims to substantially reduce the impacts of invasive species by 2030.
- **National Biodiversity Action Plan (NBAP):** Identifies invasive species management as a priority for biodiversity conservation.
- **National Action Plan on Invasive Alien Species (NAPINVAS):** Focuses on prevention, early detection, containment, and ecosystem restoration.
- **Plant Quarantine Order, 2003:** Regulates imports to prevent accidental introduction of harmful exotic species.

Challenges

- **Difficult Eradication:** Many invasive species possess high reproductive capacity, adaptability, and resistance, making complete removal difficult.
- **Weak Monitoring:** Limited surveillance and inadequate early warning systems often delay detection and response.
- **Resource Constraints:** Large-scale management requires substantial financial resources, scientific expertise, and institutional coordination.
- **Ecological Complexity:** Simply removing invasive species may not restore ecosystems unless native species and ecological functions are simultaneously revived.

Way Forward

- **Strengthen Biosecurity:** Improve quarantine facilities, border inspections, and monitoring mechanisms to prevent new introductions.
- **Early Detection:** Use satellite imagery, GIS mapping, and community-based reporting systems for rapid identification of invasions.
- **Ecological Restoration:** Removal of invasive species should be followed by plantation of native species and habitat restoration measures.
- **Community Participation:** Local communities, forest dwellers, and tribal populations should be actively involved in surveillance and management efforts.
- **Scientific Management:** Promote research on biological control methods, ecosystem restoration, and climate-resilient conservation strategies.

Conclusion

Invasive alien species have emerged as a major challenge to India's biodiversity, ecological security, and sustainable development. Effective management requires moving beyond mere removal towards a comprehensive approach that integrates prevention, early detection, ecological restoration, and community participation. Strengthening biosecurity and restoring native ecosystems will be crucial for enhancing India's ecological resilience and achieving its biodiversity conservation goals.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following invasive alien species found in India:

1. Lantana camara

2. *Prosopis juliflora*
3. *Parthenium hysterophorus*

Which of the above are considered invasive alien species in India?

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

Answer: (c)

Descriptive Question

Q. Invasive Alien Species (IAS) have emerged as a major threat to biodiversity conservation in India. Discuss the causes, impacts, and measures required for effective management of invasive species. (10 Marks, 150 Words).

- Neyyar Wildlife Sanctuary
- Kalakkad Mundanthurai Tiger Reserve

Significance

- The reserve is known for **tropical evergreen forests, medicinal plants, endemic flora and fauna, and rich ecological diversity.**
- It is one of India's most important centres of plant diversity and conservation.

Biodiversity Hotspots

- The **Western Ghats** is one of the world's **eight hottest biodiversity hotspots** and a frequent topic in UPSC Prelims.

Endemic Species

- Discovery of new endemic species highlights the ecological importance of protected areas and the need for biodiversity conservation.

Conservation Challenges

- Small and isolated populations are more susceptible to extinction, underscoring the importance of habitat protection and species recovery programmes.

New Evergreen Tree Species Discovered in Kerala

Why in News: Researchers from the **Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI)** have discovered a new evergreen tree species, ***Humboldtia nairiana***, in the **Shendurney Wildlife Sanctuary** of Kerala's Western Ghats.

Key Highlights

Species

- ***Humboldtia nairiana*** is a newly discovered evergreen tree belonging to the **Fabaceae (Legume) family** and the ***Humboldtia* genus**, which is known for its high level of endemism in the Western Ghats.
- The tree grows up to **5–8 metres** in height and possesses distinct morphological characteristics that differentiate it from other species of the genus.

Endemism

- The species is **endemic to Kerala** and has been reported only from the **Agasthyamala Biosphere Reserve** in the southern Western Ghats.
- Its discovery reinforces the Western Ghats' status as one of the world's most important biodiversity hotspots with high levels of species endemism.

Conservation

- The known habitat of the species is restricted to **less than 2 sq. km**, with **fewer than 10 mature individuals** identified in the wild.
- Such a small population makes the species highly vulnerable to habitat degradation, climate change, and stochastic environmental events.

Agasthyamala Biosphere Reserve

Location

- Located in the **southern Western Ghats**, the biosphere reserve extends across **Kerala and Tamil Nadu**.
- **UNESCO Status**
- It was included in the **UNESCO World Network of Biosphere Reserves in 2016**.

Protected Areas

- Major protected areas within the reserve include:
 - Shendurney Wildlife Sanctuary
 - Peppara Wildlife Sanctuary

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding ***Humboldtia nairiana***:

1. It is a newly discovered evergreen tree species belonging to the Fabaceae family.
2. It is endemic to the Agasthyamala Biosphere Reserve.
3. It has been included in the IUCN Red List as Critically Endangered.

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

Answer: (a)

Barn Swallow

Why in News: A recent study by the **Wildlife Institute of India (WII)** has found that the **Barn Swallow** has established a year-round breeding population in **Manipur's Imphal Valley**, indicating a shift from its traditionally migratory behaviour.

Key Findings

- **Behavioural Change:** The species is showing a transition from migratory to resident behaviour due to favourable local ecological conditions.
- **Contributing Factors:** Climate change, land-use changes, availability of insects, and suitable nesting sites have supported permanent settlement.
- **Community Support:** The Meitei community considers the bird a symbol of prosperity and protects its nests, contributing to its successful breeding.

About Barn Swallow

- **Scientific Name:** *Hirundo rustica*

- **Family:** Hirundinidae
- **Type:** Small migratory insectivorous songbird.
- **Identification:** Blue-black upper body, chestnut throat, buff underparts, and a distinctive deeply forked tail.

Habitat and Behaviour

- **Synanthropic Species:** Closely associated with human settlements and commonly nests on buildings, bridges, and other man-made structures.
- **Diet:** Feeds mainly on flying insects such as flies, beetles, wasps, and butterflies.
- **Breeding:** Builds cup-shaped mud nests and generally raises two broods during the breeding season.

Ecological Importance

- **Natural Pest Controller:** Helps regulate insect populations and reduces pest pressure in agricultural ecosystems.
- **Environmental Indicator:** Changes in its migration and breeding patterns can provide insights into climate and ecosystem changes.
- **Conservation Status**
- **IUCN Red List:** Least Concern
- **Wild Life (Protection) Act, 1972:** Schedule II

Supreme Court Review of Wetland Conservation Rules, 2017

Why in News: The **Supreme Court of India** has agreed to examine the constitutional validity of the **Wetlands (Conservation and Management) Rules, 2017**, following concerns that the Rules exclude many human-made and artificial wetlands from legal protection.

Key Issues

Ramsar Convention

- The petition argues that the 2017 Rules are inconsistent with the **Ramsar Convention, 1971**, which recognises and protects both **natural and artificial wetlands** without distinction.

Wetland Protection

- Certain categories of wetlands such as reservoirs, irrigation tanks, aquaculture ponds, and salt pans are excluded under the 2017 Rules, potentially affecting the protection status of several ecologically important wetlands.

Non-Regression Principle

- The petition claims that the 2017 Rules dilute environmental safeguards available under the

Wetlands Rules, 2010, which provided broader coverage to human-made wetlands.

Decentralisation

- Unlike the 2010 framework, the 2017 Rules empower **State Wetland Authorities (SWAs)** to identify and notify wetlands, raising concerns regarding inconsistent implementation and possible misuse.

Judicial Concerns

- The petition contends that the Rules may be inconsistent with the Supreme Court's directions in **M.K. Balakrishnan v. Union of India (2017)**, which emphasised protection of wetlands mapped under the **National Wetland Atlas**.

Ecological Approach

- Critics argue that wetlands should be identified based on ecological functions such as **biodiversity conservation, groundwater recharge, flood control, and hydrological significance**, rather than solely on whether they are natural or artificial.

Wetlands (Conservation and Management) Rules, 2017

Objective

- To conserve, manage, and ensure the wise use of wetlands across India through a decentralised regulatory framework.

Key Features

- Establishment of **State Wetland Authorities (SWAs)** for wetland identification and management.
- Prohibition of activities such as encroachment, solid waste dumping, and permanent construction within notified wetlands.
- Promotion of integrated wetland conservation through state-level action plans.

Ramsar Convention

About

- An international treaty adopted in **1971** at **Ramsar, Iran**, for the conservation and sustainable use of wetlands.

India and Ramsar

- India became a signatory in **1982** and currently has **94 Ramsar Sites**, the highest in Asia.

Significance

- Wetlands support biodiversity, groundwater recharge, carbon sequestration, flood regulation, and livelihood security.

Hantavirus Outbreak

Why in News: A suspected outbreak of Hantavirus Infection on a cruise ship near Cape Verde has led to deaths and quarantine measures, raising concerns about emerging infectious diseases and global health preparedness.

Key Details

- A cruise ship carrying international passengers reported suspected hantavirus infections. Several deaths and multiple symptomatic cases have triggered emergency medical response and evacuation efforts.
- Around 150 passengers remain quarantined onboard due to infection risk. This highlights the vulnerability of closed environments like ships to disease outbreaks.
- Authorities denied docking permission to prevent spread within national territory. This reflects the importance of preventive containment measures in public health emergencies.
- The incident underscores the global risk posed by zoonotic diseases. It also shows the need for international coordination in disease surveillance and response.

About Hantavirus

- **Nature of Disease:** Hantavirus Infection is a group of viruses transmitted primarily through rodents. It causes severe illnesses affecting lungs or kidneys, depending on the strain.
- **Origin:** The virus was first identified near the Hantan River in South Korea in the 1970s. The name “Hantavirus” is derived from this geographical origin.
- **Types of Illness:** It causes Hantavirus Pulmonary Syndrome (HPS) and Hemorrhagic Fever with Renal Syndrome (HFRS). Both conditions have high fatality rates if not treated early.
- **Global Occurrence:** Cases are reported in Asia, Europe, and the Americas. It is considered a rare but potentially deadly infectious disease worldwide.

Mode of Transmission

- **Rodent-Borne Disease:** The virus spreads through contact with infected rodent urine, droppings, or saliva. Humans get infected when contaminated particles become airborne and are inhaled.
- **Limited Human Transmission:** Person-to-person transmission is extremely rare. This reduces the risk of large-scale pandemics compared to airborne viruses like COVID-19.

- **Environmental Factors:** Poor sanitation and rodent infestation increase infection risk. Rural and forested areas are more vulnerable to outbreaks.
- **High-Risk Groups:** Farmers, campers, and people in rodent-prone areas are at greater risk. Occupational exposure plays a significant role in transmission.

Symptoms and Clinical Features

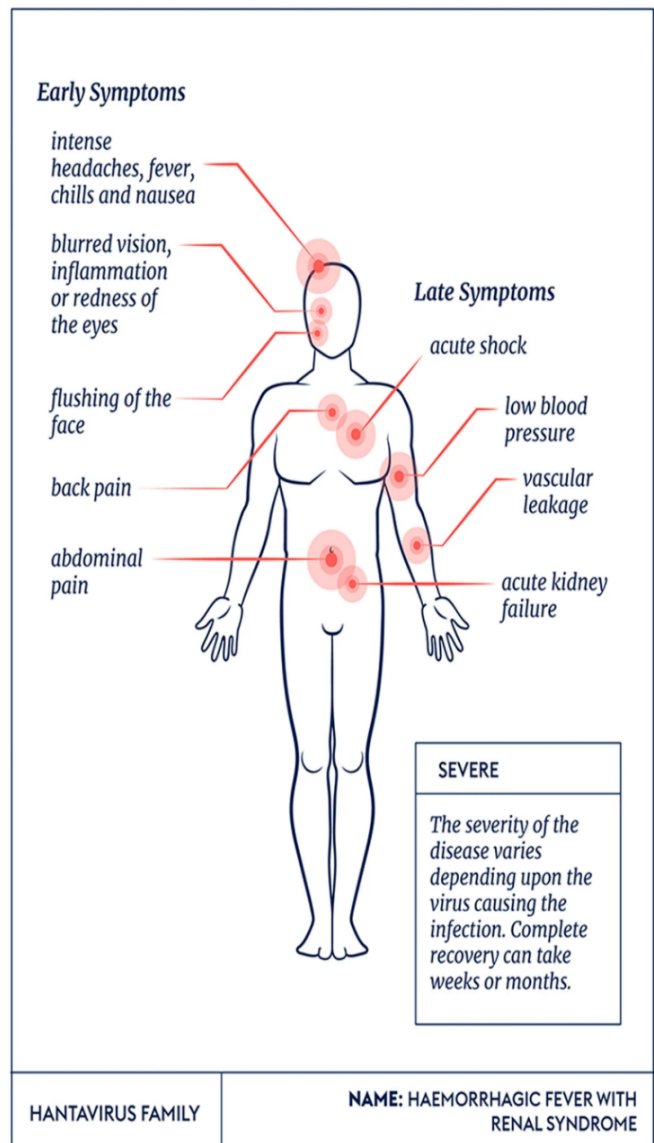
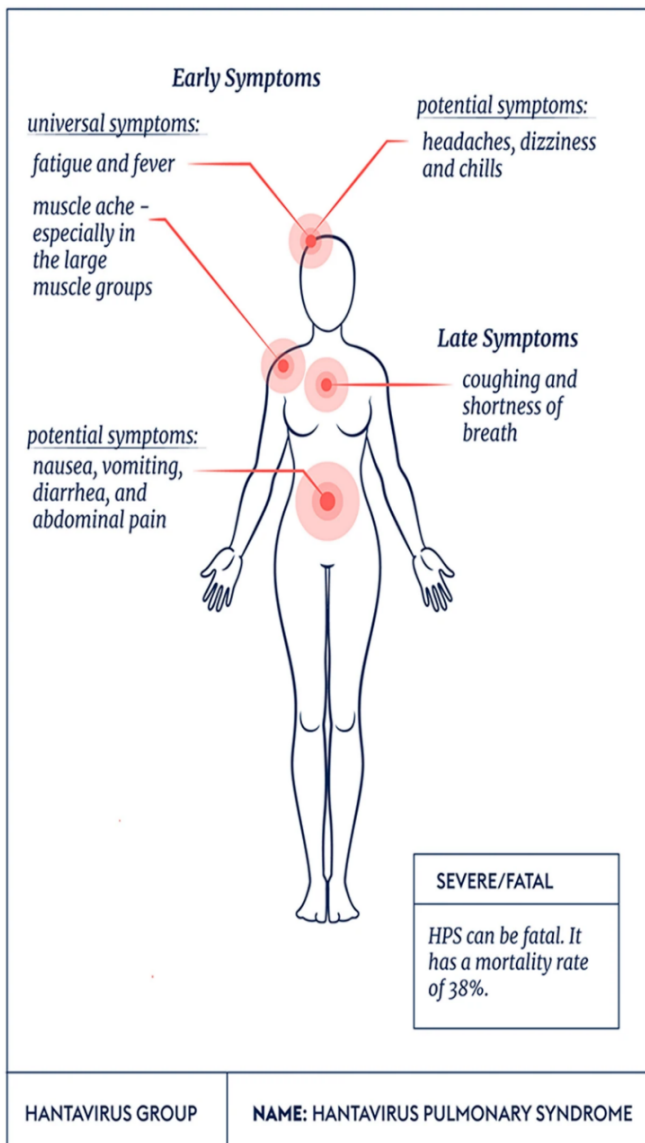
- **Early Symptoms:** Fever, fatigue, muscle aches, and headaches are common. These symptoms resemble flu, making early diagnosis difficult.
- **Advanced Symptoms:** Severe coughing and shortness of breath develop later. Fluid accumulation in lungs can lead to respiratory failure.
- **Disease Progression:** Symptoms worsen within 4–10 days after infection. Early medical attention is critical to reduce fatality risk.
- **Fatality Rate:** Hantavirus infections can have mortality rates of 30–40%. This makes it one of the more dangerous zoonotic diseases.

Treatment and Prevention

- **No Specific Cure:** There is no targeted antiviral treatment available. Management focuses on supportive care like oxygen therapy and hydration.
- **Early Detection:** Early hospitalisation improves survival chances significantly. Delay in treatment often leads to severe complications.
- **Preventive Measures:** Avoiding contact with rodents and maintaining hygiene is essential. Use of protective gear in high-risk areas reduces exposure.
- **Public Awareness:** Awareness campaigns are crucial to prevent outbreaks. Education about transmission and symptoms can save lives.

Public Health Response and Governance

- **Containment Measures:** Quarantine and travel restrictions are key strategies. These help prevent spread across borders and populations.
- **Role of WHO:** The World Health Organization monitors outbreaks and provides guidelines. It assesses risk levels and supports countries in response efforts.
- **International Coordination:** Cross-border cooperation is essential in disease control. Global health security depends on timely information sharing.
- **Preparedness Gaps:** Many countries lack rapid response systems for rare diseases. This highlights the need for strengthening health infrastructure.



What are Zoonotic Diseases?

- **Definition:** Zoonotic diseases are infections transmitted from animals to humans. Examples include Ebola, Nipah, and COVID-19.
- **Rising Trend:** Increased human-animal interaction is driving new disease emergence. Urbanisation and deforestation contribute to this trend.
- **Global Health Concern:** Zoonotic diseases pose major threats to public health systems. They can disrupt economies and global mobility.
- **India's Context:** India faces risks due to biodiversity and population density. Strengthening surveillance and healthcare systems is crucial.

Way Forward

- **Strengthening Surveillance:** Improve early detection systems for zoonotic diseases. This will help in timely containment and response.
- **Research and Development:** Invest in vaccines and antiviral treatments. Innovation is key to tackling emerging health threats.
- **Public Health Infrastructure:** Enhance hospital capacity and emergency preparedness. Robust systems reduce mortality and economic impact.

- **Global Cooperation:** Promote international collaboration in disease monitoring. Collective action is essential for global health security.

Conclusion

The hantavirus outbreak highlights the persistent threat of zoonotic diseases in a globalised world. Strengthening surveillance, preparedness, and international cooperation is essential to prevent such outbreaks from escalating into major health crises.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Which of the following are zoonotic diseases?

1. Hantavirus
2. Nipah Virus
3. Tuberculosis
4. Ebola

Select the correct answer:

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

Answer: (a)

Descriptive Question

Q. "Zoonotic diseases are emerging as a major global health challenge." Discuss in the context of recent outbreaks like hantavirus. Also suggest measures to strengthen public health preparedness. (250 words, 15 marks)

India's First Orbital Data Centre Satellite: Pathfinder

Why in News: Indian space-tech startup **Pixxel** has partnered with **Sarvam AI** to launch **Pathfinder**, India's first orbital data centre satellite, by the end of 2026. The mission aims to process Artificial Intelligence (AI) workloads directly in space using data-centre-grade computing systems.

Key Details

- Pathfinder will be a **200-kg satellite** carrying advanced GPUs capable of performing AI computations in orbit.
- The satellite will integrate **hyperspectral imaging** with onboard AI processing to generate actionable insights directly in space.
- The mission seeks to validate critical technologies such as **edge computing, thermal management, power optimisation, and real-time AI inference** in the space environment.
- It represents a major step towards developing **space-based digital infrastructure** and expanding India's participation in the global space economy.

Understanding Orbital Data Centres

What is an Orbital Data Centre?

- An orbital data centre is a satellite or constellation of satellites equipped with high-performance computing systems that process data directly in space.
- Unlike conventional satellites that transmit raw data to Earth, orbital data centres use **edge computing** to analyse information at the source and send only useful outputs to ground stations.
- The concept combines **space technology, cloud computing, artificial intelligence, and advanced communication systems** into a single infrastructure.

Why is Space-Based Computing Gaining Importance?

- **Rising Demand for Artificial Intelligence**
 - Generative AI and machine learning applications require enormous computational resources, leading to unprecedented growth in data-centre demand.
 - Countries are exploring alternative computing infrastructures to meet future AI requirements while reducing pressure on terrestrial resources.
- **Constraints of Terrestrial Data Centres**
 - Modern data centres require vast amounts of land, electricity, and water for cooling and maintenance.
 - Increasing energy consumption and carbon emissions have raised concerns regarding the

long-term sustainability of conventional computing infrastructure.

- **Need for Faster Data Processing**

- Earth observation satellites generate massive amounts of data daily, much of which remains underutilised due to transmission limitations.
- Processing information in orbit can significantly reduce latency and improve decision-making efficiency.

Significance of the Pathfinder Mission

- **Advancing India's Space Capabilities**

- The mission reflects India's transition from a satellite-launching nation to a developer of advanced space-based computing infrastructure.
- It aligns with India's objective of becoming a major stakeholder in the emerging global space economy.

- **Strengthening Artificial Intelligence Ecosystem**

- Pathfinder will demonstrate the feasibility of integrating AI models directly with satellite systems.
- Such capabilities can support India's efforts to build a secure and self-reliant AI ecosystem.

- **Improving Earth Observation Applications**

- Real-time processing can enhance disaster management, precision agriculture, environmental monitoring, and urban planning.
- Faster interpretation of satellite data can improve policy responses and governance outcomes.

- **Strategic and Security Importance**

- Space-based computing can support defence surveillance, border monitoring, intelligence gathering, and secure communication networks.
- Reduced dependence on external computing infrastructure enhances technological sovereignty and national security.

- **Promoting Private Sector Participation**

- The project highlights the growing contribution of Indian startups to advanced space technologies following recent space-sector reforms.
- It demonstrates the potential of public-private collaboration in achieving strategic technological goals.

Challenges Associated with Orbital Data Centres

- **Thermal Management in Space**

- Space is a vacuum where conventional cooling mechanisms cannot function effectively.
- Heat generated by high-performance processors must be dissipated through specialised radiative cooling systems, increasing design complexity.

- **Radiation Exposure**
 - Cosmic radiation and solar particles can damage electronic components and disrupt computing processes.
 - Additional shielding increases satellite weight and launch costs.
- **Power and Energy Constraints**
 - Although solar energy is abundant in space, satellites experience eclipse periods during which energy generation is interrupted.
 - Reliable energy storage systems are therefore essential for uninterrupted operations.
- **Miniaturisation of Computing Infrastructure**
 - Data-centre-grade hardware must be integrated into compact satellite platforms without compromising performance.
 - Achieving this balance requires significant innovation in semiconductor and satellite engineering.
- **High Cost and Maintenance Challenges**
 - Launching advanced computing hardware into orbit involves substantial capital investment.
 - Unlike terrestrial facilities, satellites cannot be easily repaired or upgraded after deployment.
- **Scalability Concerns**
 - A large number of satellites may be required to match the computational capacity of a terrestrial data centre.
 - This raises questions regarding long-term economic viability and operational sustainability.

India's Space Sector and Emerging Technologies

- **Space Sector Reforms**
 - The **Indian Space Policy 2023** encourages greater private-sector participation in satellite manufacturing, launch services, and space-based applications.
 - Institutions such as **IN-SPACE** have created a supportive ecosystem for innovation and commercialisation.
- **Convergence of Frontier Technologies**
 - Pathfinder demonstrates the convergence of Artificial Intelligence, Big Data Analytics, Cloud Computing, Edge Computing, and Space Technology.
 - Such technological integration is likely to define future economic and strategic competitiveness.

Way Forward

- **Developing Indigenous Space Computing Infrastructure:** India should invest in advanced processors, radiation-resistant electronics and space-grade computing systems to reduce import dependence.
- **Strengthening Research and Development:** Greater collaboration among ISRO, startups, academic

institutions, and industry can accelerate innovation in space-based computing technologies.

- **Enhancing Space Sustainability:** Future orbital computing systems must incorporate measures to minimise space debris and ensure responsible utilisation of orbital resources.
- **Expanding Public-Private Partnerships:** Continued policy support and investment incentives can help Indian startups compete in the emerging global market for orbital computing services.
- **Building Regulatory Frameworks:** A comprehensive framework governing data security, satellite operations, and AI-based space applications will be essential as the technology matures.

Conclusion

The Pathfinder mission marks a significant milestone in India's technological journey by bringing together **Artificial Intelligence, edge computing, and space technology**. Beyond its scientific value, it reflects India's growing ambitions in digital infrastructure, strategic autonomy, and the commercial space sector. While several technological and economic challenges remain, successful demonstration of orbital computing could position India among the pioneers of a transformative new frontier in global technology.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. With reference to Orbital Data Centres, consider the following statements:

1. They process satellite-generated data directly in space.
2. They primarily use convection-based cooling systems similar to terrestrial data centres.
3. They can reduce bandwidth requirements by transmitting processed insights instead of raw data.

Which of the statements given above is/are correct?

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

Answer: (b)

Descriptive Question

Q. The emergence of orbital data centres represents the convergence of artificial intelligence, cloud computing, and space technology. Examine their significance for India's technological and strategic ambitions. Also discuss the challenges associated with space-based computing. (15 Marks, 250 Words)

Bundibugyo Virus Outbreak

Why in News: The **World Health Organization (WHO)** recently declared the Ebola outbreak caused by the **Bundibugyo virus** in Uganda and the Democratic Republic of the Congo as a **Public Health Emergency of**

International Concern (PHEIC), highlighting concerns over the absence of a licensed vaccine or specific treatment.

Key Details

- **Public Health Emergency:** WHO's declaration reflects the potential for international spread and the need for coordinated global action to contain the outbreak and strengthen preparedness mechanisms.
- **Vaccine Preparedness Gap:** Unlike some other Ebola virus species, Bundibugyo virus currently lacks an approved vaccine or targeted therapeutic, exposing critical gaps in global health security frameworks.
- **Regional Health Challenge:** The outbreak is primarily concentrated in Central and East Africa, regions that often face healthcare infrastructure limitations and recurrent zoonotic disease outbreaks.
- **Global Relevance:** The outbreak underscores the importance of surveillance, international cooperation, and investment in research for emerging infectious diseases.

About Bundibugyo Virus

- **Nature of the Disease**
 - **Ebola-Causing Virus:** Bundibugyo virus is one of the species of the Orthoebolavirus genus responsible for causing Ebola Virus Disease (EVD), a severe viral haemorrhagic fever with significant mortality rates.
- **Zoonotic Origin**
 - **Animal Reservoir:** Fruit bats are considered the most likely natural reservoir of the virus. Human infections occur when people come into contact with infected wildlife, highlighting the role of animal-human interfaces in disease emergence.
- **Disease Severity**
 - **High Fatality Risk:** Previous outbreaks in Uganda and the Democratic Republic of the Congo recorded fatality rates ranging from 30% to 50%, demonstrating the virus's capacity to cause severe public health emergencies.

Transmission and Clinical Features

- **Transmission Mechanism**
 - **Direct Contact Spread:** The virus spreads through infected blood, body fluids, secretions, contaminated surfaces, and infected wildlife. Healthcare settings with inadequate infection-control practices often become centres of transmission.
- **Incubation Period**
 - **Delayed Symptom Onset:** The incubation period ranges from 2 to 21 days, during which infected individuals usually remain asymptomatic and non-contagious, complicating surveillance efforts.
- **Symptoms**
 - **Progressive Disease Pattern:** Initial symptoms such as fever, headache, fatigue, and muscle pain resemble common tropical

diseases like malaria. Advanced stages may involve gastrointestinal complications, organ failure, and haemorrhagic manifestations.

- **Diagnostic Challenges**

- **Similarity with Endemic Diseases:** Because early symptoms overlap with diseases such as malaria and typhoid, laboratory confirmation through PCR and antibody-based tests becomes essential for accurate diagnosis.

Understanding Ebola Virus Disease

- **Nature of Ebola**

- **Severe Viral Illness:** Ebola Virus Disease is a highly infectious and often fatal disease caused by viruses belonging to the Orthoebolavirus genus. It was first identified in 1976 near the Ebola River in present-day Democratic Republic of the Congo.

- **Ebola Variants**

- **Multiple Disease-Causing Species:** Ebola virus, Sudan virus, Bundibugyo virus, and Tai Forest virus are known to infect humans, whereas Reston and Bombali viruses have not yet caused human disease.

- **Public Health Impact**

- **Global Health Threat:** Major Ebola outbreaks have demonstrated how infectious diseases can overwhelm healthcare systems, disrupt economies, and create humanitarian crises across borders.

Significance of the Outbreak

- **Global Health Security**

- **Emerging Disease Threat:** The outbreak highlights the persistent threat posed by zoonotic diseases and the need for robust international disease surveillance systems.

- **One Health Perspective**

- **Interconnected Health Systems:** The outbreak reinforces the importance of the One Health approach, which recognises the interconnected nature of human, animal, and environmental health.

- **Research and Innovation Gap**

- **Need for Broader Vaccine Development:** Current vaccine efforts largely focus on specific Ebola strains, demonstrating the necessity of investing in broad-spectrum vaccines and therapeutics.

- **Lessons for Developing Countries**

- **Preparedness and Resilience:** Countries with dense populations and biodiversity, including India, can draw important lessons regarding surveillance, outbreak response, and healthcare preparedness.

Challenges

- **Vaccine and Treatment Deficit**

- **Limited Medical Countermeasures:** The absence of approved vaccines and specific

therapeutics for Bundibugyo virus increases dependence on supportive care and traditional containment strategies.

- **Weak Health Infrastructure**
 - **Capacity Constraints:** Many affected regions face shortages of trained personnel, diagnostic laboratories, and isolation facilities, slowing response efforts.
- **Community Resistance**
 - **Social and Cultural Barriers:** Fear, misinformation, stigma, and traditional practices may reduce compliance with public health guidelines and hamper containment efforts.
- **Cross-Border Risks**
 - **International Spread Potential:** Population mobility and porous borders increase the risk of disease transmission across countries, necessitating coordinated regional responses.

Way Forward

- **Strengthening Surveillance Systems**
 - **Early Warning Mechanisms:** Expanding laboratory networks, genomic surveillance, and disease monitoring systems can enable quicker detection and containment of outbreaks.
- **Accelerating Vaccine Research**
 - **Investment in Medical Innovation:** Greater funding for vaccine development and therapeutic research is essential to address neglected but potentially dangerous pathogens.
- **Adopting One Health Approach**
 - **Integrated Disease Prevention:** Coordinated efforts among public health agencies, veterinary services, and environmental institutions can reduce the risk of zoonotic spillovers.
- **Building Health System Resilience**
 - **Preparedness and Response Capacity:** Strengthening healthcare infrastructure, emergency response systems, and workforce training will improve readiness for future outbreaks.
- **Enhancing Global Cooperation**
 - **Collective Health Security:** Effective information sharing, technical assistance, and coordinated international action are critical to addressing transboundary health threats.

Conclusion

Need for Comprehensive Preparedness: The Bundibugyo virus outbreak demonstrates that emerging zoonotic diseases continue to challenge global health security. Strengthening surveillance, research, healthcare infrastructure, and international cooperation will be crucial to preventing future outbreaks from evolving into major public health emergencies.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Bundibugyo Virus Disease (BVD):

1. It is caused by a species of the Orthoebolavirus genus.
2. Fruit bats are considered the most likely natural reservoir.
3. A licensed vaccine is currently available for Bundibugyo virus disease.

Which of the statements given above is/are correct?

Answer: (a) 1 and 2 only

Descriptive Question

Q. The recent Bundibugyo virus outbreak highlights the growing challenge of zoonotic diseases in the contemporary world. Discuss the significance of the One Health Approach in strengthening global health security and pandemic preparedness. (GS Paper III, 15 Marks).

Fractional Quantum Hall Effect (FQHE)

Why in News: Scientists have recently recreated the **Fractional Quantum Hall Effect (FQHE)** in **twisted multilayer graphene** without requiring extremely strong magnetic fields. The breakthrough is expected to advance research in **quantum computing, quantum materials, and next-generation electronics**.

Key Details

- **Scientific Breakthrough:** Researchers have observed FQHE under comparatively accessible conditions, making experimental studies and future applications more feasible.
- **Quantum Materials:** The discovery highlights the importance of graphene-based quantum materials that exhibit unique properties arising from collective electron behaviour.
- **Technological Potential:** The development could contribute to fault-tolerant quantum computers, precision sensors, and advanced electronic systems.

From Hall Effect to Quantum Hall Effect

- **Hall Effect:** Discovered by **Edwin Hall (1879)**, it refers to the generation of a voltage across a conductor when an electric current flows through it in the presence of a magnetic field.
- **Quantum Hall Effect (QHE):** At extremely low temperatures and strong magnetic fields, Hall resistance becomes quantised, taking fixed values instead of changing continuously.
- **Scientific Importance:** QHE provided one of the strongest experimental validations of quantum mechanics and revolutionised condensed matter physics.

What Makes FQHE Unique?

- **Beyond Individual Electrons:** Unlike the Integer Quantum Hall Effect, FQHE arises due to strong interactions among electrons, causing them to behave collectively.

- **New State of Matter:** These interactions create exotic quantum states that cannot be explained by conventional theories of particle behaviour.
- **Fractional Values:** Hall resistance appears in fractional values such as $1/3$ and $2/5$, giving the phenomenon its name.

Emergence of Anyons

- **Exotic Quasiparticles:** FQHE leads to the formation of quasiparticles called **Anyons**, which possess fractional electric charge.
- **Quantum Significance:** Anyons are neither conventional fermions nor bosons and exhibit unique quantum properties.
- **Future Applications:** Their stability makes them promising candidates for fault-tolerant quantum computing.

Role of Graphene

- **Ideal Quantum Material:** Graphene is a two-dimensional sheet of carbon atoms known for exceptional electrical and mechanical properties.
- **Twisted Multilayer Graphene:** Rotating graphene layers at specific angles creates conditions that enhance electron interactions and enable the observation of complex quantum phenomena.
- **Recent Achievement:** The latest breakthrough demonstrates that engineered materials can replicate FQHE under less extreme conditions.

Importance of the Discovery

- **Quantum Computing:** Anyons could help overcome error-correction challenges in quantum computers and support the development of topological quantum computing.
- **Precision Measurement:** Quantum Hall phenomena are used globally to establish highly accurate electrical resistance standards.
- **Advanced Technologies:** Insights from FQHE can contribute to developments in quantum communication, spintronics, and next-generation electronic devices.

Challenges

- **Experimental Complexity:** Observing FQHE still requires highly controlled laboratory environments and sophisticated equipment.
- **Commercialisation Gap:** Translating laboratory discoveries into commercially viable technologies remains a major challenge.
- **Infrastructure Needs:** Quantum research demands significant investment in advanced facilities and skilled manpower.

India and Quantum Technologies

- **National Quantum Mission (NQM):** India has launched NQM to strengthen capabilities in quantum computing, communication, sensing, and materials research.
- **Research Potential:** Institutions such as Indian Institute of Science, Tata Institute of Fundamental

Research, and IITs are contributing to cutting-edge quantum research.

- **Strategic Relevance:** Quantum technologies are increasingly important for technological self-reliance, cybersecurity, and future economic growth.

Way Forward

- **Strengthen Research:** Greater investment in fundamental quantum science is essential for future technological breakthroughs.
- **Build Infrastructure:** Expansion of advanced laboratories and fabrication facilities can accelerate innovation.
- **Promote Collaboration:** Stronger partnerships among academia, industry, and government institutions can facilitate technology transfer and commercialisation.
- **Develop Human Capital:** Specialised training programmes are necessary to build a skilled quantum workforce.

Conclusion

The recent recreation of the **Fractional Quantum Hall Effect** in twisted multilayer graphene represents a major advance in quantum science. By revealing new forms of collective electron behaviour and enabling the study of exotic quasiparticles such as anyons, the discovery has significant implications for quantum computing, advanced materials, and precision technologies. As countries increasingly invest in quantum technologies, strengthening research capabilities, infrastructure, and innovation ecosystems will be crucial for harnessing the benefits of the emerging quantum revolution.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the Fractional Quantum Hall Effect (FQHE):

1. It arises due to strong interactions among electrons.
2. It leads to the formation of quasiparticles called Anyons.
3. Hall resistance in FQHE takes only integer values.

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)

Descriptive Question

Q. Recent advances in graphene-based quantum materials have renewed interest in the Fractional Quantum Hall Effect (FQHE). Discuss its significance for quantum computing and emerging technologies. (10 Marks, 150 Words)

Synthetic “Learning” Metamaterials

Why in News: Researchers from Europe have developed **synthetic metamaterials capable of learning and changing shape** without using conventional computer processors. Published in *Nature Physics*, the study marks a major breakthrough in **adaptive materials, soft robotics, and embodied artificial intelligence (AI)**.

Key Details

- **Scientific Breakthrough:** The newly developed metamaterials can learn, adapt, forget, and relearn based on environmental inputs, mimicking certain characteristics of biological systems.
- **Hardware-Based Learning:** Unlike conventional AI systems that rely on software algorithms and processors, learning occurs directly within the material's structure.
- **Adaptive Behaviour:** The innovation enables materials to autonomously modify their shape and function in response to changing conditions.
- **Future Potential:** The technology could transform fields such as robotics, healthcare, manufacturing, aerospace, and smart infrastructure.

Understanding Metamaterials

- **Engineered Materials:** Metamaterials are artificially designed materials whose properties arise primarily from their internal structure rather than their chemical composition.
- **Unique Characteristics:** By carefully arranging microscopic structures, scientists can create materials with properties not found in nature, such as unusual mechanical, optical, or electromagnetic behaviour.
- **Difference from Conventional Materials:** Traditional materials generally retain fixed properties after manufacturing, whereas metamaterials can be designed to perform specialised functions.

From Passive to Adaptive Materials

- **Conventional Limitation:** Most existing materials can respond to external forces such as heat, pressure, or stress but cannot independently adapt their internal structure.
- **Biological Inspiration:** Living organisms continuously adjust to environmental changes through learning and adaptation. Scientists are now attempting to replicate similar capabilities in synthetic materials.
- **Paradigm Shift:** Learning metamaterials represent a transition from passive materials to active systems capable of responding intelligently to their surroundings.

How Do Learning Metamaterials Work?

- **Embedded Learning:** The material contains interconnected structural units that continuously compare different states and adjust themselves to achieve a desired configuration.
- **Learning and Memory:** The system can learn new responses, forget outdated patterns, and relearn when

conditions change, similar to adaptive processes observed in biological systems.

- **Energy Efficiency:** The presence of bistable units allows the material to switch between stable states with minimal energy consumption.

Concept of Embodied Intelligence

- **Beyond Software-Based AI:** Conventional artificial intelligence relies on external processors and software to make decisions. In learning metamaterials, intelligence is embedded directly into the physical structure.
- **Integrated Functionality:** The material itself performs sensing, adaptation, and response without requiring complex computational control systems.
- **Emerging Scientific Field:** This concept of embodied intelligence is increasingly viewed as a promising direction for future robotics and autonomous systems.

Significance for Robotics

- **Soft Robotics:** Learning metamaterials can enable robots that adapt their shape, movement, and behaviour automatically in unpredictable environments.
- **Autonomous Functioning:** Such systems reduce dependence on continuous programming and external control mechanisms.
- **Enhanced Resilience:** Adaptive materials may allow robots to continue functioning even when exposed to physical damage or changing environmental conditions.

Applications Across Sectors

- **Healthcare:** Adaptive prosthetics, implants, and wearable devices could automatically adjust to individual patient needs and physiological changes.
- **Smart Infrastructure:** Buildings and structures may be designed to respond dynamically to temperature changes, stress, vibrations, or natural disasters.
- **Defence and Aerospace:** Self-adjusting materials could improve performance, durability, and operational flexibility in challenging environments.
- **Manufacturing:** Programmable materials may support advanced manufacturing systems and Industry 4.0 technologies.

Economic and Strategic Importance

- **Innovation-Led Growth:** Learning metamaterials have the potential to create entirely new industrial sectors based on programmable and adaptive materials.
- **Industry 4.0:** The technology aligns with the broader trend of integrating artificial intelligence, automation, and advanced materials into manufacturing processes.
- **Technological Competitiveness:** Countries investing in frontier material sciences are likely to gain strategic advantages in emerging technology domains.

Challenges

- **Scalability:** Current prototypes require complex hardware configurations that are difficult to scale for large-scale industrial applications.

- **High Costs:** Designing and manufacturing adaptive metamaterials remain expensive and technologically demanding.
- **Reliability Concerns:** Long-term durability, stability, and performance under real-world operating conditions are yet to be fully established.
- **Commercialisation Gap:** Significant research and engineering efforts are required before widespread deployment becomes feasible.

Relevance for India

- **Advanced Manufacturing:** Learning metamaterials can support India's ambitions in high-technology manufacturing and innovation-driven economic growth.
- **National Missions:** The technology aligns with initiatives such as **Make in India**, **Digital India**, and the promotion of deep-tech innovation ecosystems.
- **Research Opportunities:** Indian institutions working in materials science, artificial intelligence, robotics, and nanotechnology can contribute significantly to this emerging field.

Way Forward

- **Miniaturisation:** Reducing the size and complexity of adaptive hardware components will improve practical usability and scalability.
- **AI Integration:** Combining metamaterials with advanced sensors and AI systems can enhance responsiveness and autonomous decision-making.
- **Cost Reduction:** Developing efficient fabrication techniques will be essential for commercial adoption and mass production.
- **Interdisciplinary Research:** Strong collaboration among materials scientists, physicists, roboticists, and AI researchers will accelerate technological progress.

Conclusion

The development of synthetic learning metamaterials represents a significant step towards creating materials that

can sense, adapt, and respond to their environment without external computation. By blurring the distinction between intelligence and matter, the technology opens new possibilities in robotics, healthcare, manufacturing, and smart infrastructure. As the world moves towards Industry 4.0 and intelligent systems, learning metamaterials could become a foundational technology for the next generation of adaptive and autonomous innovations.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. With reference to metamaterials, consider the following statements:

1. Their properties depend primarily on their internal structure rather than chemical composition.
2. Learning metamaterials can adapt their configuration in response to environmental inputs.
3. Learning metamaterials require conventional computer processors for all decision-making functions.

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)

Descriptive Question

Q. What are metamaterials? Discuss the significance of synthetic learning metamaterials in advancing robotics, artificial intelligence, and next-generation manufacturing systems. (15 Marks, 250 Words).

TARA Glide Weapon System

Why in News: Defence Research and Development Organisation and the Indian Air Force successfully conducted the first flight trial of the indigenous Tactical Advanced Range Augmentation (TARA) system, a glide weapon kit capable of converting unguided bombs into precision-guided munitions.

Key Details

- **TARA (Tactical Advanced Range Augmentation)** is India's first indigenous glide weapon kit designed to convert conventional unguided bombs into precision-guided weapons. The system enhances the strike range and accuracy of existing warheads without requiring a completely new missile platform.
- The system was successfully tested from an IAF fighter aircraft off the coast of Odisha. The trial validated the glide, navigation, and guidance capabilities of the indigenous system under operational conditions.
- TARA has been developed by Hyderabad-based Research Centre Imarat in collaboration with multiple DRDO laboratories and Indian industry partners. The project reflects India's increasing focus on indigenous defence manufacturing and public-private collaboration.
- The Defence Ministry stated that production activities have already started through Development-cum-Production Partners (DcPPs). This will support faster induction into the armed forces and strengthen the domestic defence industrial ecosystem.

What is the TARA Glide Weapon System?

- **Modular Glide Kit:** TARA is essentially a modular kit that can be attached to conventional gravity bombs or unguided warheads. Once integrated, the bomb gains precision guidance and extended stand-off strike capability.
- **Glide-Based Mechanism:** Unlike conventional missiles that rely heavily on rocket propulsion, TARA primarily uses aerodynamic glide technology. This reduces overall weight and cost while significantly increasing operational range.
- **Foldable Wings and Aerodynamic Surfaces:** After release from the aircraft, foldable wings deploy automatically. These aerodynamic structures allow the weapon to glide over long distances instead of directly falling on the target.
- **Precision Guidance System:** The system uses inertial navigation and satellite-based positioning for mid-course corrections. This improves strike accuracy and allows the weapon to precisely engage intended targets.



Understanding Precision-Guided Munitions

- **Precision-Guided Munition (PGM):** A PGM is a weapon capable of accurately hitting a specific target using advanced guidance systems. These weapons minimise collateral damage and improve operational effectiveness in modern warfare.
- **Difference from Gravity Bombs:** Traditional gravity bombs follow a ballistic path after release. Precision-guided bombs can adjust their trajectory using navigation and control systems.
- **Stand-Off Capability:** Modern air warfare increasingly depends on stand-off weapons that allow aircraft to strike from safe distances. This reduces exposure of fighter aircraft to enemy air defence systems.
- **Global Trend:** Countries like the US, Russia, and China extensively use glide bombs and smart munitions. India's TARA system represents a significant step towards matching advanced global capabilities.

Strategic Importance of TARA for India

- **Enhanced Stand-Off Strike Capability:** TARA enables aircraft to attack targets from distances beyond enemy radar and missile coverage. This significantly improves survivability of fighter jets during combat operations.
- **Force Multiplier Effect:** Existing unguided bombs can be upgraded into smart weapons with relatively low investment. This allows rapid expansion of India's precision-strike inventory without developing entirely new missiles.
- **Operational Flexibility:** The modular design enables integration with different warhead categories ranging from 250 kg to 500 kg. This makes the system adaptable for diverse mission requirements.

- **Support for Network-Centric Warfare:** Precision weapons are essential components of modern integrated battle strategies. They improve coordination between surveillance, targeting, and strike systems.

Importance for Atmanirbhar Bharat in Defence

- **Indigenous Defence Manufacturing:** TARA has been developed entirely within India using domestic technological capabilities. This reduces reliance on foreign weapon systems and strengthens strategic autonomy.
- **Public-Private Partnership Model:** Indian industries are actively participating in production under the DcPP framework. This promotes defence industrialisation and technological ecosystem development within the country.
- **Import Substitution:** Precision-guided weapon kits are usually imported at high costs from advanced defence manufacturers. Indigenous alternatives help conserve foreign exchange and improve supply-chain security.
- **Boost to Defence Exports:** Successful development of low-cost smart weapon systems can enhance India's defence export potential. It aligns with India's ambition to emerge as a global defence manufacturing hub.

Technological Features of TARA

- **Inertial Navigation System (INS):** INS helps determine the weapon's position and movement without external references. It ensures continuity of navigation even if satellite signals are disrupted.
- **Satellite-Based Navigation:** The system also uses satellite positioning for improved targeting accuracy. This combination enhances reliability and precision during long-range strikes.
- **Low-Cost Precision Technology:** TARA uses relatively economical systems compared to high-end cruise missiles. This makes it suitable for large-scale deployment during prolonged conflicts.
- **Compatibility with Multiple Aircraft:** DRDO scientists have indicated that the system can be integrated with several IAF fighter platforms. This enhances interoperability and operational deployment flexibility.

India's Expanding Indigenous Defence Ecosystem

- India has recently accelerated indigenous defence programmes under the **Atmanirbhar Bharat** initiative. Major systems such as Astra missile, Akash air defence system, and Tejas aircraft reflect this trend.
- The government has increased focus on domestic R&D through DRDO and private-sector participation. This aims to reduce long-term dependence on imported defence equipment.
- India is among the world's largest arms importers despite improvements in domestic production. Indigenous systems like TARA are crucial for improving self-reliance in critical technologies.
- Defence modernisation is increasingly linked with emerging technologies like AI, autonomous systems, and precision warfare. TARA fits into this broader transformation of India's military capability.

Challenges and Future Roadmap

- **User Trials and Validation:** The successful test is only the initial phase before operational induction. Further developmental and user trials will assess reliability under varied combat conditions.
- **Integration Challenges:** Compatibility with different aircraft and mission profiles requires extensive testing. This is necessary to ensure seamless operational deployment.
- **Need for Advanced Navigation Security:** Satellite-guided systems may face risks from jamming or electronic warfare. India must strengthen secure navigation and anti-jamming capabilities.
- **Scaling Indigenous Production:** Sustained industrial capacity and supply-chain support are essential for mass production. This will determine the long-term success of indigenous defence technologies.

Way Forward

- **Strengthen Indigenous R&D:** India should continue investing in advanced defence technologies and precision warfare systems. This is critical for maintaining strategic deterrence in a rapidly evolving security environment.
- **Expand Industry Participation:** Greater collaboration with private industries and startups can accelerate innovation. It will also strengthen the domestic defence manufacturing ecosystem.
- **Focus on Integrated Warfare Systems:** Future warfare requires integration of AI, drones, sensors, and smart munitions. TARA should become part of a larger network-centric combat architecture.
- **Enhance Export Competitiveness:** India should leverage low-cost indigenous technologies to enter global defence markets. This can strengthen both strategic influence and economic growth.

Conclusion

The successful testing of the TARA glide weapon system marks a major milestone in India's indigenous defence modernisation efforts. By transforming conventional bombs into precision-guided munitions, India can enhance operational capability, reduce import dependence, and strengthen strategic deterrence. The system also reflects the growing maturity of India's domestic defence technology ecosystem under the broader vision of Atmanirbhar Bharat.

EXPECTED QUESTIONS FOR UPSC CSE

Prelims MCQ

Q. With reference to the Tactical Advanced Range Augmentation (TARA) system, consider the following statements:

1. TARA is an indigenous glide weapon system designed to convert unguided bombs into precision-guided munitions.
2. The system primarily relies on rocket propulsion throughout its flight path.
3. TARA enhances stand-off strike capability of fighter aircraft.

How many of the above statements are correct?

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

Answer: (b)

Descriptive Question

Q. "Precision-guided indigenous weapon systems are transforming India's defence preparedness and strategic autonomy." Discuss in the context of the TARA glide weapon system and India's defence modernisation efforts. (250 words, 15 marks)

Electro-Optical Seeker	Uses cameras and imaging sensors for precision targeting
-------------------------------	--

Key Features of ULPGM-V3

- **Precision Targeting:** Equipped with a high-definition dual-channel seeker. It enables accurate engagement of a wide range of stationary and moving targets.
- **All-Weather Capability:** Operates effectively during both day and night conditions. This ensures mission readiness under diverse operational environments.
- **Terrain Flexibility:** Can be deployed in plains as well as high-altitude areas. It improves combat effectiveness across different theatres of operation.
- **Real-Time Guidance:** Supports two-way data communication. Commanders can update targets and modify aim points even after launch.
- **Anti-Bunker Capability:** Features a penetration-cum-blast warhead. It can effectively destroy fortified structures and underground bunkers.

Warhead Configurations

- **Anti-Armour Warhead:** Designed to destroy modern tanks and armoured vehicles. It can penetrate advanced protection systems used in contemporary battle tanks.
- **Penetration-cum-Blast Warhead:** Used against bunkers and fortified installations. It combines deep penetration with explosive impact for maximum damage.
- **Pre-Fragmentation Warhead:** Produces high lethality effects against personnel and soft targets. It is useful against dispersed enemy formations and light military assets.

RHA and ERA
<ul style="list-style-type: none">• Rolled Homogeneous Armour (RHA): A standard steel armour used as a benchmark for measuring armour penetration capability.• Explosive Reactive Armour (ERA): Armour fitted with explosive layers that detonate on impact to reduce the effectiveness of incoming anti-tank missiles.

Defence Indigenisation and Strategic Significance

- The successful test highlights India's growing capability in indigenous missile development. It strengthens self-reliance in advanced defence technologies.
- The project demonstrates collaboration between DRDO, private industry, start-ups and MSMEs. This aligns with the government's objective of building a strong defence manufacturing ecosystem.
- Drone-launched precision weapons are becoming increasingly important in modern warfare. Recent conflicts have shown the growing role of UAVs in surveillance and precision strikes.
- The missile enhances India's capability to counter both armoured and aerial threats. It provides a force multiplier for future network-centric military operations.

Way Forward

- Accelerate induction of indigenous precision-guided systems into the armed forces. This will strengthen India's combat preparedness and technological autonomy.

DRDO Successfully Tests ULPGM-V3 Missile

Why in News: The Defence Research and Development Organisation successfully conducted flight trials of the **Unmanned Aerial Vehicle Launched Precision Guided Missile (ULPGM-V3)** at the National Open Area Range (NOAR), Kurnool, Andhra Pradesh, strengthening India's indigenous precision-strike capabilities.

Key Details

- The ULPGM-V3 was successfully tested in both **Air-to-Ground** and **Air-to-Air** modes from an indigenous UAV. The trial demonstrated the missile's capability to engage both ground-based and aerial threats effectively.
- The missile was launched from a UAV developed by NewSpace Research Technologies. The project involved collaboration between DRDO laboratories and over 30 MSMEs and start-ups.
- It is an advanced version of the earlier ULPGM-V2 missile system. The upgrade enhances India's indigenous defence technology and drone warfare capabilities.
- The recent trial focused on the anti-armour variant of the missile. It is designed to neutralise modern armoured vehicles protected by advanced armour systems.

ULPGM-V3 Missile: An Indigenous Precision Strike System

- **ULPGM-V3** is a drone-launched precision-guided missile developed by DRDO. It can accurately engage tanks, bunkers, drones, helicopters and other aerial targets.
- The missile supports both offensive and defensive military operations. This enhances the operational flexibility of India's armed forces in modern warfare.
- It represents a significant step towards defence indigenisation under the Aatmanirbhar Bharat initiative. The system reduces dependence on foreign precision-guided weapon platforms.

Important Types of Missile Guidance Systems

Guidance System	Key Feature
Laser Guidance	Tracks laser-designated targets
Infrared Guidance	Detects heat signatures of targets
Radar Guidance	Uses radar signals for tracking
GPS/INS Guidance	Navigation through satellite and inertial systems

- Promote greater participation of start-ups and MSMEs in defence innovation. This can create a robust indigenous defence industrial base.
- Invest in next-generation UAV and missile technologies. Advanced autonomous and AI-enabled systems will shape future warfare.
- Enhance exports of indigenous defence equipment. This will support India's ambition of becoming a major global defence exporter.

Conclusion

The successful testing of ULPGM-V3 marks another milestone in India's defence modernisation and indigenisation journey. By combining precision strike capability, operational flexibility, and indigenous technology, the missile strengthens India's preparedness for the evolving nature of modern warfare.

EXPECTED QUESTION FOR UPSC CSE Prelims MCQ

Q. With reference to the ULPGM-V3 missile recently tested by DRDO, consider the following statements:

1. It can be launched only against ground targets from unmanned aerial vehicles.
2. It supports real-time target updates after launch through two-way data communication.
3. It has warhead configurations designed for anti-armour, anti-bunker and high-lethality applications.

How many of the above statements are incorrect?

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

Answer: (a) 1 only

BSF's First All-Women Everest Expedition

Why in News: The Border Security Force successfully completed its first-ever all-women expedition to Mount Everest in May 2026, marking a significant achievement in

women empowerment, adventure sports, and national security history.

Key Details

- The expedition was named “**Mission Vande Mataram**” as part of BSF's Diamond Jubilee celebrations and the 150th anniversary of the national song *Vande Mataram*. It reflects the spirit of patriotism, resilience, and women's leadership in challenging environments.
- The team also participated in the “**Clean Himalaya – Clean Glaciers**” campaign. Members collected waste from Everest camps, highlighting environmental responsibility alongside adventure.
- The achievement showcases the growing role of women in India's security forces. It demonstrates their capability to undertake high-risk missions in extreme conditions.

Border Security Force (BSF)

- The BSF was established on **1 December 1965** following the India-Pakistan War of 1965. It serves as India's **First Line of Defence** along the borders with Pakistan and Bangladesh.
- The force functions under the Ministry of Home Affairs. It is one of the seven Central Armed Police Forces (CAPFs) responsible for border management and national security.
- Besides border guarding, BSF assists in counter-insurgency operations and disaster response. It also contributes to maintaining internal security during emergencies.

Central Armed Police Forces (CAPFs)

Force	Primary Responsibility
BSF	Borders with Pakistan & Bangladesh
CRPF	Internal Security & Counter-insurgency
CISF	Protection of Critical Infrastructure
ITBP	India-China Border Security
SSB	Borders with Nepal & Bhutan
Assam Rifles	Security in Northeast India
NSG	Counter-Terrorism Operations

MOUNT EVEREST

HEIGHT

Mount Everest is the highest mountain above sea level: 8,848.86 m (29,031.7 ft).

WILDLIFE

Yaks, snow leopards, Himalayan tahr, choughs, bar-headed geese, and red pandas persist surprisingly well despite extreme cold, winds, and scarcity.

CLIMATE

Everest's summit has an ice-cap climate (Köppen EF); every month averages below freezing (typical January minimum around -36°C).

LOCATION

It sits on the Nepal-China (Tibet) border in the Mahalangur Himal; the summit itself lies right on the frontier.

FORMATION

The summit rock is ancient marine limestone (Ordovician), evidence that Everest was once a seabed, later thrust skyward by the collision of the Indian and Eurasian plates.

Mount Everest

- Mount Everest is the world's highest mountain peak with a height of **8,849 metres (29,032 feet)**. It is located in the Himalayas on the border between Nepal and China (Tibet Autonomous Region).
- In Nepal, Everest is known as **Sagarmatha**, while in Tibet it is called **Chomolungma**. These names reflect the cultural and geographical significance of the mountain.
- The summit was first successfully reached in 1953 by Sir Edmund Hillary and Tenzing Norgay. The achievement remains one of the greatest milestones in mountaineering history.

Significance of the Expedition

- The expedition promotes **Nari Shakti (Women Empowerment)** in uniformed services. It encourages greater participation of women in leadership and operational roles.
- It strengthens the image of India's security forces beyond traditional border management functions. The achievement highlights physical endurance, discipline, and teamwork.
- The environmental initiative undertaken during the expedition aligns with sustainable mountain tourism. It also supports global efforts to protect fragile Himalayan ecosystems.

Conclusion

The BSF's first all-women Everest expedition is a landmark achievement combining women empowerment, national pride, environmental stewardship, and adventure excellence. It reflects the evolving role of women in India's security architecture while reinforcing the importance of preserving the Himalayan ecosystem.

I4C Alert on Apple iPhone Phishing Scam

Why in News: The Indian Cyber Crime Coordination Centre has issued an advisory warning Apple iPhone users about a sophisticated phishing campaign targeting lost or stolen devices.

Key Details

- The phishing campaign specifically targets users whose Apple iPhones have been lost or stolen. Fraudsters attempt to obtain sensitive credentials by impersonating trusted sources.
- The advisory has been issued by I4C under the Ministry of Home Affairs. I4C plays a key role in cyber threat monitoring and public awareness.
- The scam aims to trick users into revealing personal and account-related information. This can result in identity theft, financial losses, and unauthorized access to accounts.
- The incident highlights the growing threat of cybercrime in an increasingly digital society. It also underscores the importance of cyber awareness and digital hygiene.

Indian Cyber Crime Coordination Centre (I4C)

- **Nodal Agency:** I4C functions under the Ministry of Home Affairs to combat cybercrime in a coordinated manner. It acts as a central platform for cybercrime prevention, detection, and response.

- **Threat Analytics:** The centre analyses emerging cyber threats and issues advisories to the public. This helps individuals and institutions take preventive measures against cyberattacks.
- **Coordination Role:** It facilitates coordination among law enforcement agencies across India. This strengthens the overall cybercrime response mechanism.
- **Citizen Support:** I4C supports cybercrime reporting and awareness initiatives. It aims to create a safer digital ecosystem for citizens.

PHISHING

What is Phishing?

- Phishing is a cyberattack where fraudsters use fake emails, messages, calls, or websites to steal sensitive information. It is one of the most common forms of cybercrime worldwide.

Nature of Attack

- It is a form of social engineering that exploits human emotions such as trust, fear, urgency, or curiosity. Instead of attacking systems directly, it manipulates users into making mistakes.

Common Methods

- Attackers often impersonate banks, companies, government agencies, or trusted individuals. They may ask users to click malicious links, share passwords, or make payments.

Impact

- Phishing can result in theft of personal data, banking credentials, and login information. It may also lead to financial fraud, malware infection, or ransomware attacks.

Types of Phishing

- **Smishing:** Phishing attacks conducted through SMS or text messages. The attacker sends fraudulent messages to deceive victims.
- **Vishing:** Phishing attacks conducted through voice calls. Fraudsters impersonate officials or customer support representatives to obtain information.

Cyber Security Concerns

- India's rapid digitalisation has increased exposure to cyber threats and online frauds. Citizens must remain vigilant against evolving cyberattack techniques.
- Cyber awareness is becoming as important as technological security measures. An informed user is often the first line of defence against cybercrime.

Conclusion

The latest I4C advisory highlights the growing sophistication of phishing attacks targeting smartphone users. Strengthening cyber awareness, verifying communications, and avoiding suspicious links are essential steps for ensuring digital security.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to phishing, consider the following statements:

1. Phishing is a type of cyberattack that primarily exploits human behaviour and trust.
2. Smishing refers to phishing attacks carried out through SMS messages.

3. Vishing refers to phishing attacks conducted through malicious websites only.

How many of the above statements are incorrect?

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

Answer: (a) 3 only

Oreshnik Missile

Why in News: Russia reportedly used the **Oreshnik hypersonic ballistic missile** during a large-scale attack on Ukraine, marking its third reported operational use in the ongoing Russia-Ukraine conflict.

Key Details

- **The Oreshnik is a Russian hypersonic intermediate-range ballistic missile (IRBM)** capable of carrying both conventional and nuclear warheads. It is believed to be derived from the RS-26 Rubezh missile system and represents Russia's advancing missile capabilities.
- The missile can reportedly travel at speeds of **around Mach 10 (ten times the speed of sound)**. Such high speed makes interception by existing missile defence systems extremely difficult.
- Oreshnik can carry multiple warheads and strike several targets simultaneously. This enhances its effectiveness against military infrastructure and strategic assets.
- Russia claims that the missile can inflict destruction comparable to a nuclear strike even with conventional warheads. It is designed to target command centres, air bases, and deeply fortified military facilities.

Hypersonic Missiles

- Hypersonic weapons travel at speeds greater than Mach 5. Their high speed and manoeuvrability make them difficult to detect and intercept.
- These missiles can change trajectory during flight unlike traditional ballistic missiles. This reduces the effectiveness of conventional missile defence systems.
- Major military powers such as Russia, China, and the United States are investing heavily in hypersonic technology. The technology is increasingly shaping future warfare and strategic deterrence.

Intermediate-Range Ballistic Missiles (IRBMs)

- IRBMs generally have a range between 1,000 km and 5,500 km. They are designed to strike targets across regions without requiring intercontinental reach.
- These missiles play a significant role in regional military balances and deterrence strategies. Their deployment can influence geopolitical stability and security calculations.

MIRV Technology

MIRV (Multiple Independently Targetable Reentry Vehicle)

- MIRV technology allows a single missile to carry multiple warheads. Each warhead can be directed towards a different target after launch.
- It increases strike capability while complicating enemy missile defence systems. This technology is usually associated with advanced strategic and intercontinental missile systems.

- India successfully tested MIRV capability under the **Mission Divyastra** programme in 2024. It marked a significant advancement in India's strategic deterrence capability.

Strategic Significance

- The deployment of Oreshnik highlights the growing role of hypersonic weapons in modern warfare. It demonstrates the shift towards faster and harder-to-intercept strategic systems.
- The missile strengthens Russia's deterrence posture in the ongoing conflict with Ukraine and NATO. It also raises concerns regarding global arms competition and strategic stability.
- The increasing use of advanced missile systems may accelerate military modernisation among major powers. This could further complicate global security and arms control efforts.

India and Hypersonic Technology

- India is developing indigenous hypersonic capabilities through programmes led by Defence Research and Development Organisation. The aim is to enhance strategic deterrence and defence preparedness.
- Hypersonic technology is expected to play a key role in future warfare. It aligns with India's objective of achieving self-reliance in advanced defence technologies.

Conclusion

The Oreshnik missile reflects the growing importance of hypersonic weapons in contemporary warfare. As major powers compete to develop advanced missile systems, understanding technologies such as hypersonic glide vehicles and MIRVs becomes increasingly important for global security and strategic stability.

Captagon and Himachal Pradesh's Anti-Heroin Model

Why in News: The Narcotics Control Bureau seized Captagon for the first time in India under **Operation RAGEPILL** and highlighted Himachal Pradesh's Anti-Chitta Model as a successful strategy against drug trafficking and addiction.

Key Details

- The NCB recently dismantled a transnational India-Myanmar drug syndicate and seized Captagon, a highly addictive psychotropic drug. This marks India's growing focus on combating international narcotics networks rather than only local drug crimes.
- Captagon is widely linked to organized crime, terrorism financing, and conflict zones in West Asia. Its seizure highlights the increasing global dimension of India's drug enforcement challenges.
- Himachal Pradesh's Anti-Chitta Model combines strict enforcement, community participation, and rehabilitation. The model is increasingly being viewed as a best practice for tackling both supply and demand aspects of drug abuse.

Captagon: The Emerging Global Drug Threat

- **About:** Captagon was originally a pharmaceutical drug known as Fenethylamine, used to treat ADHD and narcolepsy. Today, the illicit version contains amphetamines and other stimulants, making it highly addictive.
- **"Jihadi Drug":** Captagon is frequently associated with extremist groups operating in conflict regions. It is used to suppress fatigue, fear, and hunger, enhancing physical endurance during combat.
- **Global Production Hub:** Syria is considered the largest producer of illicit Captagon. The trade generates billions of dollars and has become a major source of financing for criminal and militant networks.
- **Legal Status:** Captagon is regulated under the UN Convention on Psychotropic Substances, 1971. In India, it is prohibited under the NDPS Act, 1985.

Narcotics Control Bureau (NCB)

- The NCB is India's apex drug law enforcement and intelligence agency under the Ministry of Home Affairs. It was established in 1985 following the enactment of the NDPS Act.
- The agency coordinates with central and state authorities to combat drug trafficking. It also collects intelligence and monitors emerging narcotics trends across the country.
- The NCB plays a critical role in tackling transnational organized crime networks. Its recent operations reflect India's expanding focus on international drug supply chains.

Linkages Between Organized Crime and Terrorism

- Drug trafficking generates substantial illicit revenue for organized criminal groups. These financial networks often overlap with terror financing and arms smuggling activities.
- Profits from narcotics are frequently used to support insurgent and extremist organizations. This makes drug trafficking a significant national security concern.
- The global Captagon trade illustrates the nexus between conflict economies and illegal drug markets. It demonstrates how narcotics can destabilize both governance and regional security.

Himachal Pradesh's Anti-Chitta Model

- **Panchayat-Level Mapping:** Himachal Pradesh became the first state to identify drug hotspots at the grassroots level. Areas were categorized into Red, Yellow, and Green Zones for targeted intervention.
- **Strict Enforcement:** Authorities have confiscated illegal assets linked to drug traffickers under the PIT-NDPS Act, 1988. This weakens the financial foundation of drug syndicates.
- **Community Participation:** Anti-Chitta Volunteers provide local intelligence and support awareness campaigns.

The approach strengthens cooperation between citizens and law enforcement agencies.

- **Focus on Rehabilitation:** The state treats addiction as a social and health challenge rather than only a criminal issue. New rehabilitation centres are being developed with support from leading medical institutions.

Anti-Chitta Model: Key Pillars

Supply Side Measures

- Asset seizure of traffickers
- Strict enforcement under PIT-NDPS Act
- Drug hotspot mapping

Demand Side Measures

- Rehabilitation centres
- Community awareness programmes
- Youth de-addiction initiatives

Governance Measures

- Panchayat-level monitoring
- Anti-Chitta Volunteers
- Multi-agency coordination

India's Legal Framework Against Drug Trafficking

- **NDPS Act, 1985:** Principal legislation governing narcotic drugs and psychotropic substances. It provides stringent punishment for production, trafficking, and possession of prohibited drugs.
- **PIT-NDPS Act, 1988:** Enables preventive detention of persons involved in illicit drug trafficking. It strengthens enforcement against repeat offenders and organized networks.
- **International Cooperation:** India works with international agencies to combat transnational narcotics trafficking. This is increasingly important due to the cross-border nature of drug syndicates.

Way Forward

- Strengthen intelligence sharing between national and international enforcement agencies. This will improve the detection of transnational drug networks.
- Expand community-based anti-drug initiatives on the lines of Himachal Pradesh's model. Local participation can significantly improve prevention and early intervention efforts.
- Increase investment in rehabilitation and mental health infrastructure. A balanced strategy should address both enforcement and recovery.
- Leverage technology, data analytics, and border surveillance to detect emerging drug threats. This will help India stay ahead of evolving narcotics networks.

Conclusion

The first seizure of Captagon in India highlights the growing nexus between organized crime, terrorism, and transnational drug trafficking. Himachal Pradesh's Anti-Chitta Model demonstrates that effective drug control requires a combination of strict enforcement, community engagement, and rehabilitation. India's future anti-narcotics strategy must integrate security, governance, and public health approaches.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to Captagon and drug control mechanisms in India, consider the following statements:

1. Captagon was originally developed as a pharmaceutical stimulant known as Fenethylamine.
2. The Narcotics Control Bureau functions under the Ministry of Home Affairs.
3. The PIT-NDPS Act, 1988 deals with preventive detention related to illicit drug trafficking.

How many of the above statements are correct?

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

Answer: (c)

SOCIAL ISSUES

Supreme Court Expands Definition of Acid Attack Victims under RPwD Act, 2016

Why in News: The Supreme Court of India has expanded the scope of the **Rights of Persons with Disabilities (RPwD) Act, 2016** by recognising survivors of **forcible acid ingestion** as "acid attack victims". The ruling extends disability rights, compensation, and rehabilitation benefits to victims suffering severe internal injuries even without visible disfigurement.

Key Details

- **Expanded Protection:** The Court held that acid attack victims include not only those on whom acid is thrown but also those who are forcibly made to ingest acid, causing permanent internal damage and disability.
- **Retrospective Benefit:** The judgment applies retrospectively from 2016, enabling affected victims to claim disability certificates, compensation, reservations, and welfare benefits under the RPwD Act.
- **Constitutional Intervention:** Invoking **Article 142**, the Court treated the expanded definition as a "deemed amendment" until Parliament formally incorporates the change into the law.
- **Victim-Centric Justice:** The ruling reflects a shift towards recognising the full spectrum of physical, psychological, and social consequences faced by acid attack survivors.

Context

- **Nature of Acid Attacks:** Acid attacks are among the most brutal forms of gender-based violence, involving the use of corrosive substances to inflict permanent physical, psychological, and social harm.
- **Gender Dimension:** Most victims are women, and attacks are often linked to rejection of marriage proposals, personal disputes, domestic violence, or attempts to control women's autonomy and choices.
- **Human Rights Concern:** Beyond bodily injuries, acid attacks frequently result in loss of livelihood, social exclusion, mental trauma, and long-term dependence on medical care.

Judgment

- **Broadened Definition:** The Court clarified that disability caused by acid exposure should not be judged solely on visible disfigurement. Severe internal injuries resulting from forced acid consumption also constitute disability.
- **Substantive Equality:** The judgment advances the constitutional principle that individuals suffering similar levels of harm should receive equal legal protection irrespective of the form of injury.
- **Complete Justice:** By using Article 142, the Court sought to bridge a legislative gap and ensure immediate

relief to victims who would otherwise remain outside the legal framework.

RPwD Act

- **Rights-Based Framework:** The RPwD Act, 2016 replaced the earlier welfare-oriented approach with a rights-based model consistent with the **United Nations Convention on the Rights of Persons with Disabilities (UNCRPD)**.
- **Expanded Coverage:** The Act increased recognised disabilities from 7 to 21 categories and empowers the government to include additional disabilities when required.
- **Key Entitlements:** The legislation provides reservations in education and employment, accessibility rights, social security measures, and protection against discrimination.

Legal Framework

- **Bharatiya Nyaya Sanhita (BNS), 2023:** Acid attacks are recognised as serious offences punishable with a minimum of 10 years imprisonment, extendable to life imprisonment, along with fines.
- **Bharatiya Nagrik Suraksha Sanhita (BNSS), 2023:** Hospitals are mandated to provide immediate free treatment, while statutory victim compensation mechanisms support rehabilitation.
- **NALSA Support:** The National Legal Services Authority provides legal aid, rehabilitation assistance, and support services to acid attack survivors.

Significance

- **Recognition of Invisible Disabilities:** The ruling acknowledges that disability may arise from internal organ damage and not merely visible physical injuries.
- **Strengthening Victims' Rights:** It expands access to compensation, rehabilitation, education, employment opportunities, and social welfare schemes.
- **Progressive Jurisprudence:** The judgment reflects the evolving interpretation of dignity, equality, and disability rights under the Constitution.
- **Gender Justice:** By recognising the broader consequences of acid violence, the decision strengthens legal protection for women who disproportionately suffer such crimes.

Challenges

- **Weak Investigations:** Delayed FIRs, inadequate forensic evidence, and poor tracing of acid sources often weaken prosecution and reduce conviction rates.
- **Judicial Delays:** Acid attack cases frequently remain pending for years, causing prolonged hardship and undermining victims' faith in the justice system.
- **Easy Availability of Acid:** Despite judicial guidelines, acid remains easily accessible in many areas due to weak regulation and enforcement.

- **Social Stigma:** Survivors often face discrimination, victim-blaming, social isolation, and psychological trauma, making rehabilitation difficult.
- **Delayed Rehabilitation:** Compensation, medical assistance, reconstructive surgeries, and vocational support are often delayed or insufficient.

Governance

- **Implementation Deficit:** Existing legal provisions are relatively robust, but enforcement remains inconsistent across states and agencies.
- **Institutional Coordination:** Effective rehabilitation requires coordination among police, healthcare institutions, social welfare departments, legal services authorities, and civil society organisations.
- **Accountability Mechanisms:** Stronger monitoring of acid sales, victim compensation schemes, and rehabilitation programmes is necessary for meaningful implementation.

Way Forward

- **Strengthen Regulation:** Strict monitoring of acid production, sale, storage, and distribution is necessary to prevent misuse and deter attacks.
- **Fast-Track Justice:** Dedicated courts and time-bound investigations can improve conviction rates and ensure timely justice for survivors.
- **Comprehensive Rehabilitation:** Long-term medical care, reconstructive surgeries, psychological counselling, skill development, and employment support should be institutionalised.
- **Victim-Centric Policing:** Sensitisation of police, prosecutors, and judicial officers can improve survivor experiences and reduce secondary victimisation.
- **Social Awareness:** Public campaigns should challenge patriarchal attitudes, gender-based violence, and societal stigma associated with acid attack survivors.

Conclusion

The Supreme Court's decision marks an important step towards a more inclusive and rights-based understanding of disability and gender justice. By extending legal recognition to survivors of forcible acid ingestion, the Court has strengthened the constitutional principles of equality, dignity, and access to justice. However, meaningful change will depend not only on progressive judicial interpretation but also on effective implementation, timely rehabilitation, stricter regulation of acid sales, and broader societal efforts to eliminate gender-based violence.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the Rights of Persons with Disabilities (RPwD) Act, 2016, consider the following statements:

1. The Act was enacted to implement India's obligations under the UN Convention on the Rights of Persons with Disabilities.
2. The Act increased the number of recognised disabilities from 7 to 21.

3. Acid attack victims are included under the category of benchmark disabilities.

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: (d)

Descriptive Question

Q. Acid attacks represent one of the most extreme forms of gender-based violence in India. In light of the recent Supreme Court judgment expanding the definition of acid attack victims under the RPwD Act, 2016, discuss the challenges faced by survivors and suggest measures for ensuring justice, rehabilitation, and social reintegration. (15 Marks, 250 Words).

School Management Committee (SMC) Guidelines, 2026

Why in News: The **Ministry of Education** recently clarified the applicability of the **School Management Committee (SMC) Guidelines, 2026**, stating that certain privately managed schools covered under **Section 2(n)(iv) of the Right of Children to Free and Compulsory Education (RTE) Act, 2009** and not receiving government aid or grants are exempt from these guidelines.

Key Details

- **Launch of Guidelines:** The Ministry of Education launched the **SMC Guidelines, 2026** to strengthen community participation, decentralized governance, and accountability in school education.
- **Government Clarification:** Following concerns regarding applicability, the Ministry clarified that unaided schools covered under Section 2(n)(iv) of the RTE Act are not mandatorily required to implement these guidelines.
- **Voluntary Adoption:** Although exempt, such schools have been encouraged to constitute SMCs to promote transparency, stakeholder participation, and improved school governance.
- **Focus on Learning Outcomes:** The guidelines aim to place children's welfare at the centre of school administration by fostering collaboration among schools, parents, local communities, and government authorities.

School Management Committees

- **Meaning:** School Management Committees (SMCs) are statutory bodies established under the **Right to Education Act, 2009** to ensure community participation in school management and decision-making.
- **Composition:** An SMC generally consists of elected parents, teachers, local authority representatives, and community members, with parents constituting the majority.
- **Purpose:** SMCs act as a bridge between schools and communities, ensuring greater accountability, transparency, and responsiveness in school functioning.

Composition of SMC:

Each SMC shall consist of the following members:

1	Elected Member from Parents/Guardian	Chairperson
2	Elected Member from Parents/Guardian	Vice Chairperson
3	Parents/Guardian from all grades of children studying in school	Member
4	Elected members of the local authority	Member
5	Teachers from the school	Member
6	Local educationists / Subject Experts / academicians / senior students / alumni of the school / AWW / ASHA / ANM	Member
7	Principal / Head Master / School In-charge	Member-Secretary

Constitutional Basis

- **Right to Education:** Article 21A of the Constitution guarantees free and compulsory education to all children aged 6–14 years and forms the constitutional foundation of the RTE Act, 2009.
- **Decentralisation:** The SMC framework reflects the principles of democratic decentralisation and participatory governance envisaged under the Constitution.
- **Citizen Participation:** It strengthens grassroots involvement in public service delivery by giving parents and local communities a role in educational governance.

RTE Framework

- **Section 21 of RTE Act:** It mandates the constitution of School Management Committees in government and government-aided schools to monitor functioning and prepare school development plans.
- **Section 2(n)(iv):** This category includes specified schools such as certain special-category institutions

that may not receive government funding and therefore have different regulatory obligations.

- **Recent Clarification:** The Ministry has clarified that unaided schools falling under this category are outside the mandatory ambit of the SMC Guidelines, 2026.

Significance

- **Community Ownership:** SMCs encourage local communities to take ownership of schools, thereby improving accountability and public trust in educational institutions.
- **Better Governance:** Active stakeholder participation helps identify local challenges, improve infrastructure, and enhance the quality of education.
- **Inclusive Decision-Making:** The involvement of parents ensures that school policies and priorities remain aligned with the needs of students and communities.
- **Improved Learning Outcomes:** Research indicates that greater parental involvement often contributes to improved attendance, retention, and academic performance.

SMC Size:

Number of members of the committee may be decided based on the enrolment of the children:

Enrolment Range	Approx. No. of Members
Up to 100 students	12-15 members
100-500 students	15-20 members
Above 500 students	20–25 members

Challenges

- **Limited Awareness:** Many parents and community members remain unaware of their rights and

responsibilities within School Management Committees.

- **Capacity Constraints:** Lack of training and administrative knowledge often limits the effectiveness of SMC members in decision-making.
- **Token Participation:** In several instances, SMCs exist only on paper and do not actively participate in school governance.
- **Resource Limitations:** Schools in remote and underdeveloped regions may face financial and infrastructural constraints that reduce the effectiveness of community-led initiatives.

Relevance for Educational Governance

- **Participatory Governance:** SMCs represent a practical example of grassroots governance in the education sector, consistent with broader democratic decentralisation reforms.
- **Accountability Mechanism:** They provide local oversight over school functioning, utilisation of resources, and implementation of educational schemes.
- **Social Inclusion:** SMCs can play an important role in ensuring representation of disadvantaged groups and addressing local educational disparities.

Way Forward

- **Capacity Building:** Regular training programmes should be conducted to equip SMC members with administrative, financial, and monitoring skills.
- **Awareness Generation:** Greater awareness among parents and communities can improve participation and effectiveness of SMCs.
- **Digital Governance:** Technology-based monitoring and communication platforms can strengthen transparency and accountability.
- **Collaborative Approach:** Schools, parents, local authorities, and governments should work together to create child-centric and inclusive learning environments.
- **Strengthening Local Institutions:** Empowering community-based institutions can contribute significantly to improving educational outcomes and governance standards.

Conclusion

The **School Management Committee Guidelines, 2026** reflect the broader objective of promoting participatory and decentralized educational governance in India. By strengthening community involvement and accountability mechanisms, SMCs can play a crucial role in improving school functioning and learning outcomes. While the recent clarification exempts certain unaided schools from mandatory compliance, the spirit of community participation remains central to achieving the constitutional goal of equitable, inclusive, and quality education for all children.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to School Management Committees (SMCs), consider the following statements:

1. School Management Committees are provided for under the Right to Education Act, 2009.
2. Parents constitute the majority of members in School Management Committees.

3. School Management Committees are mandatory for all private unaided schools under the RTE Act.

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)

Descriptive Question

Q. Discuss the role of School Management Committees (SMCs) in strengthening decentralized educational governance in India. Examine the challenges affecting their effectiveness and suggest measures for improving community participation in school education. (10 Marks, 150 Words).

NITI Aayog's Roadmap for Quality Education

Why in News: A recent **NITI Aayog** report titled "*School Education System in India: Temporal Analysis and Policy Roadmap for Quality Enhancement*" has highlighted persistent challenges in India's school education system, including high dropout rates, declining learning outcomes, inadequate infrastructure, teacher shortages, and digital disparities. The report proposes structural reforms aligned with the vision of the **National Education Policy (NEP) 2020**.

Key Details

- **Quality Concern:** Despite near-universal enrolment at the elementary level, learning outcomes, retention rates, and school infrastructure continue to remain major concerns.
- **Demographic Dividend:** The findings assume greater significance as India seeks to transform its large youth population into a skilled and productive workforce.
- **Policy Focus:** The report emphasizes shifting the focus from mere enrolment to quality, continuity, equity, and competency-based learning.
- **NEP Alignment:** Several recommendations support the implementation of NEP 2020 and Sustainable Development Goal-4 (Quality Education).

Context

- **Education as Human Capital:** Education is a key driver of economic growth, social mobility, innovation, and nation-building. Improved educational outcomes directly contribute to productivity and inclusive development.
- **Constitutional Commitment:** Education derives support from **Article 21A (Right to Education)**, **Article 45**, and **Directive Principles of State Policy**, reflecting the state's responsibility towards universal and quality education.

Dropouts

- **Leaky Educational Pipeline:** The report describes India's school structure as a "pyramid", where the number of institutions declines sharply from primary to higher secondary levels, creating transition barriers for students.
- **Retention Challenge:** Only about **5.4% of schools provide uninterrupted education from Classes 1-12**,

forcing students to change schools multiple times and increasing dropout risks, particularly among disadvantaged groups.

- **Higher Secondary Concern:** The Gross Enrolment Ratio (GER) at the higher secondary stage remains significantly lower than elementary education levels, indicating substantial student attrition.

Learning

- **Foundational Learning Crisis:** While enrolment levels have improved considerably, foundational literacy and numeracy outcomes remain below expectations.
- **Application Deficit:** Assessment studies indicate that students often perform better in rote-based questions but struggle to apply concepts in real-life situations, reflecting a gap between schooling and actual learning.
- **Competency-Based Education:** The findings reinforce the need to move from content-heavy learning towards conceptual understanding and problem-solving skills, as envisioned under NEP 2020.

Privatisation

- **Shift Towards Private Schools:** Government school enrolment has steadily declined, while private school enrolment has increased due to perceptions of better quality and accountability.
- **Equity Concerns:** The growing dependence on private schooling raises concerns regarding affordability, educational inequality, and access for economically weaker sections.

Infrastructure

- **Basic Amenities Gap:** Many schools continue to face shortages of electricity, drinking water, sanitation, and handwashing facilities, affecting both learning outcomes and student well-being.
- **Academic Infrastructure Deficit:** A significant number of secondary schools lack science laboratories, libraries, and internet connectivity, limiting experiential and technology-enabled learning.
- **Resource Inefficiency:** The existence of thousands of zero-enrolment schools reflects administrative inefficiencies and suboptimal utilisation of educational resources.

Teachers

- **Human Resource Challenges:** Teacher shortages, particularly in rural and remote areas, continue to affect classroom instruction and student learning.
- **Single-Teacher Schools:** The persistence of over one lakh single-teacher schools highlights the challenge of ensuring adequate staffing and subject-specific expertise.
- **Capacity Building:** Continuous teacher training and professional development remain essential for implementing competency-based and technology-driven education reforms.

Digitalisation

- **Digital Divide:** Although internet access has expanded significantly, many schools still lack reliable digital connectivity, particularly in rural and aspirational districts.
- **Technology in Education:** The introduction of Artificial Intelligence and Computational Thinking in schools

reflects India's efforts to prepare students for future technologies.

- **Balanced Adoption:** The report cautions that technology should complement rather than replace critical thinking, creativity, and teacher-led learning.

Governance

- **Institutional Weaknesses:** Variations in school quality assessment, monitoring mechanisms, and educational administration affect overall system performance.
- **Need for Accountability:** Strengthening institutional frameworks is necessary to ensure consistent standards, transparency, and continuous improvement in educational outcomes.

Reforms

- **Cylindrical Schooling Model**
 - **Educational Continuity:** NITI Aayog recommends replacing the fragmented pyramid structure with integrated schools offering education from Classes 1 to 12, reducing transition-related dropouts.
- **School Complexes**
 - **Resource Sharing:** In line with NEP 2020, clusters of schools can share laboratories, libraries, sports facilities, and specialised teachers, improving efficiency and quality.
- **Quality Assessment**
 - **Performance Monitoring:** Strengthening State School Standards Authorities (SSSAs) and assessment frameworks can improve accountability and educational standards.
- **Community Participation**
 - **Bottom-Up Governance:** Empowering School Management Committees (SMCs) and local communities can strengthen ownership and improve school functioning.
- **Digital Public Infrastructure**
 - **Technology Integration:** Convergence of initiatives such as PM e-Vidya, BharatNet, and Digital Public Infrastructure can enhance access to quality education, especially in underserved regions.
- **Teacher Recruitment**
 - **Vacancy Mapping:** Time-bound recruitment and rational deployment of teachers and educational administrators can address staffing gaps.
- **Increased Investment**
 - **Financing Education:** The report reiterates the long-standing recommendation of increasing public expenditure on education to **6% of GDP**, a target repeatedly emphasised in national education policies.

Significance

- **Demographic Dividend:** Quality school education is essential for converting India's demographic advantage into a productive and skilled workforce.

- **Inclusive Development:** Improved educational outcomes contribute to poverty reduction, social justice, gender empowerment, and economic mobility.
- **Global Competitiveness:** Strong foundational education strengthens India's capacity for innovation, research, entrepreneurship, and participation in the knowledge economy.

Challenges

- **Access-Quality Paradox:** Expansion of enrolment has not been matched by corresponding improvements in learning outcomes.
- **Regional Disparities:** Significant differences exist across states in terms of infrastructure, teacher availability, and educational performance.
- **Resource Constraints:** Limited funding and administrative inefficiencies continue to affect implementation of reforms.
- **Digital Inequality:** Unequal access to technology risks creating new forms of educational exclusion.

Way Forward

- **Focus on Learning Outcomes:** Educational reforms must prioritise foundational literacy, numeracy, critical thinking, and competency-based learning.
- **Strengthen Public Schools:** Improving infrastructure, teacher quality, and accountability can restore confidence in government schools.
- **Promote Educational Equity:** Special attention should be given to rural areas, girls, socio-economically disadvantaged groups, and children with disabilities.
- **Leverage Technology Responsibly:** Digital tools should enhance accessibility and learning while safeguarding creativity and independent thinking.
- **Increase Public Investment:** Sustained financial commitment is necessary to achieve the objectives of NEP 2020 and SDG-4.

Conclusion

The NITI Aayog report highlights that India's education challenge is no longer merely about enrolment but about ensuring quality, continuity, and meaningful learning. Transforming the existing fragmented schooling structure, strengthening foundational learning, improving infrastructure, and enhancing governance will be critical for building a skilled and future-ready workforce. As India aspires to become a knowledge-based economy, investing in quality school education must remain a national development priority.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the recommendations of NITI Aayog on school education:

1. It recommends establishing School Complexes for sharing educational resources.
2. It advocates replacing the existing fragmented school structure with integrated schooling from Classes 1 to 12.
3. It recommends reducing public expenditure on education to improve efficiency.

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)

Descriptive Question

Q. Despite significant progress in school enrolment, learning outcomes and retention remain major challenges in India's education system. Discuss the key issues highlighted by the recent NITI Aayog report and suggest measures to improve the quality of school education. (15 Marks, 250 Words).

NEET-UG 2026 Paper Leak

Why in News: The **National Testing Agency (NTA)** cancelled the **NEET-UG 2026** examination following allegations of a major paper leak and circulation of a highly accurate "guess paper." The investigation has been transferred to the **Central Bureau of Investigation (CBI)**, reigniting concerns about transparency, accountability, and security in India's examination ecosystem.

Key Details

- **Examination Crisis:** The cancellation of one of India's largest entrance examinations has raised serious questions about the credibility and reliability of public examinations.
- **Systemic Concerns:** The incident highlights structural weaknesses in examination management, including paper security, logistical vulnerabilities, and technological limitations.
- **Youth Impact:** Repeated examination irregularities affect millions of students, creating uncertainty, financial burdens, and psychological stress.
- **Reform Imperative:** The controversy has renewed attention on the implementation of recommendations made by the **Dr. K. Radhakrishnan Committee (2024)** and the **Public Examinations (Prevention of Unfair Means) Act, 2024**.

Examination Ecosystem in India

- **Merit-Based Selection:** Competitive examinations serve as the primary mechanism for admission and recruitment in higher education and public services, ensuring fairness and equal opportunity.
- **Scale and Complexity:** India conducts some of the world's largest examinations, involving millions of candidates across thousands of centres, making security and coordination a significant challenge.

Structural Challenges

- **Institutional Limitations:** Unlike constitutional bodies such as the UPSC, the NTA functions as a society registered under the Societies Registration Act, 1860, raising concerns regarding accountability and institutional autonomy.
- **Lack of Permanent Capacity:** Dependence on contractual and deputation-based staff limits the development of specialised expertise in examination security, psychometrics, and risk management.
- **High-Stakes Examination Model:** Conducting examinations for millions of candidates on a single day creates a "single-point failure" risk, where any security breach affects the entire system.

Security Vulnerabilities

- **Paper Handling Risks:** Printing, transportation, storage, and distribution of question papers involve multiple human interfaces, increasing the possibility of leaks and unauthorised access.
- **Centre-Level Weaknesses:** Variations in infrastructure, surveillance systems, and invigilation standards across examination centres create opportunities for malpractice.
- **OMR-Based Challenges:** Physical transportation and handling of answer sheets can expose the process to tampering and manipulation risks.

Technology Challenges

- **Digital Transition Dilemma:** While Computer-Based Tests (CBTs) can reduce paper leaks, they introduce cybersecurity threats such as hacking, remote access attacks, and digital manipulation.
- **Infrastructure Deficit:** India still lacks adequate government-owned high-capacity testing centres, resulting in dependence on private infrastructure and uneven quality standards.
- **Evolving Malpractices:** Advanced cheating methods involving encrypted communication platforms, AI-enabled tools, and wearable devices are becoming increasingly difficult to detect.

Socio-Economic Dimensions

- **Extreme Competition:** With millions of aspirants competing for limited seats, examinations such as NEET have become highly competitive, increasing incentives for organised malpractice.
- **Coaching Culture:** The expansion of the coaching industry has intensified a results-driven environment,

sometimes encouraging unethical shortcuts and examination-related corruption.

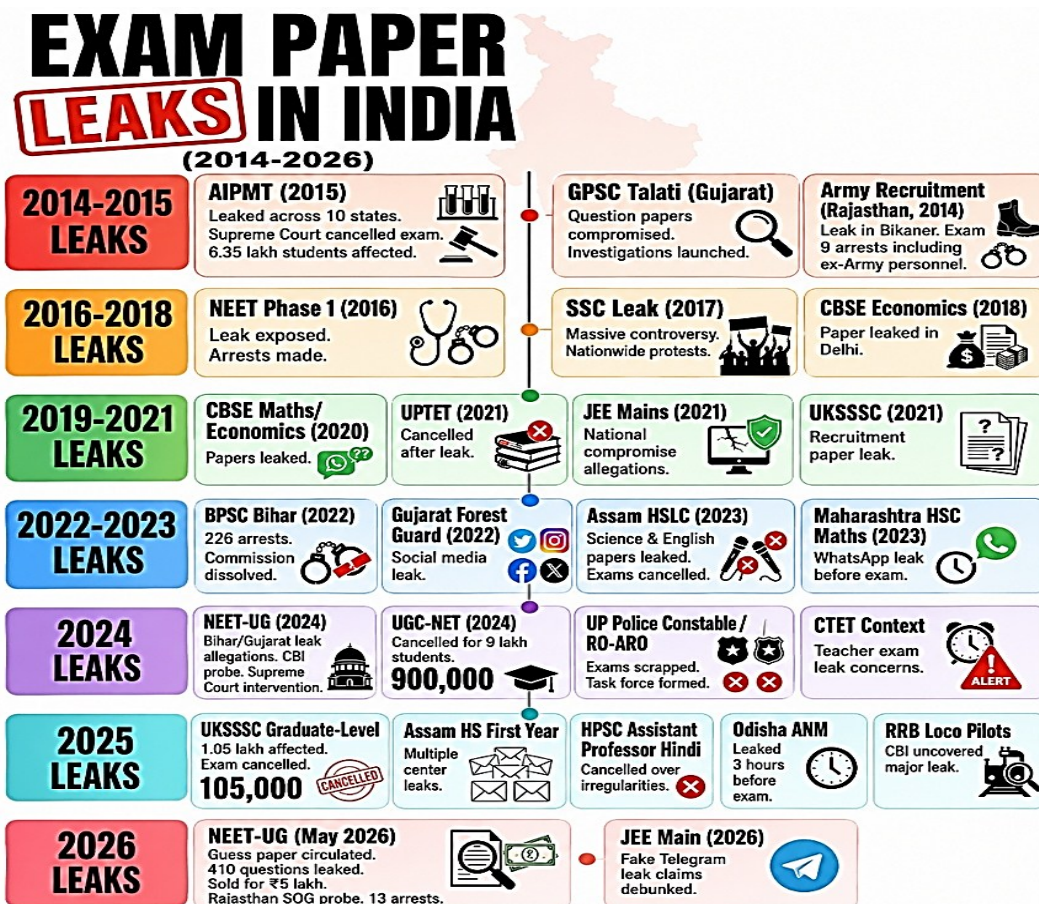
- **Financial Burden:** Examination cancellations impose significant costs on students and families who spend substantial resources on travel, accommodation, and preparation.

Ethical Concerns

- **Erosion of Meritocracy:** Paper leaks undermine the principle of fair competition and weaken public confidence in the examination system.
- **Impact on Vulnerable Groups:** Students from rural, economically weaker, and marginalized backgrounds suffer disproportionately because they lack access to illicit networks and unfair advantages.
- **Psychological Distress:** Repeated cycles of preparation, uncertainty, cancellation, and re-examination contribute to stress, anxiety, and mental health challenges among youth.
- **Public Trust Deficit:** Failure to conduct secure examinations weakens citizens' trust in public institutions and governance mechanisms.

National Testing Agency (NTA)

- **Establishment:** Created in 2017 by the Ministry of Education, the NTA is an autonomous organisation responsible for conducting transparent and standardised entrance examinations.
- **Major Examinations:** It conducts key examinations including **NEET-UG, JEE Main, CUET-UG, CUET-PG, UGC-NET, and CSIR-UGC NET.**
- **Core Functions:** The agency is tasked with conducting examinations, developing question banks, identifying testing centres, and promoting scientific testing standards.



Radhakrishnan Committee Reforms

- **Institutional Restructuring:** The Committee recommended transforming the NTA into a more autonomous, professionally managed, and accountable organisation with specialised divisions for technology, security, and governance.
- **DIGI-EXAM Framework:** It proposed Aadhaar-linked authentication, biometric verification, and AI-based candidate validation to strengthen examination integrity.
- **Technology-Driven Testing:** The Committee suggested encrypted digital transmission of question papers and secure centre-level printing to minimise leak risks.
- **Permanent Testing Infrastructure:** Establishment of dedicated secure testing centres across the country was recommended to standardise examination security.
- **Capacity Building:** Regular training of invigilators, administrators, and technical staff was proposed to address evolving technological and security challenges.

Public Examinations Act, 2024

- **Legal Framework:** The Act aims to prevent unfair means in examinations conducted by central agencies such as UPSC, SSC, RRBs, IBPS, and NTA.
- **Stringent Penalties:** It prescribes imprisonment and heavy fines for individuals and organised groups involved in paper leaks and examination fraud.
- **Coverage of Modern Offences:** The law addresses impersonation, cyber intrusions, OMR manipulation, and unauthorised access to examination systems.
- **Technology Safeguards:** It provides for the creation of technical mechanisms to strengthen security in both paper-based and computer-based examinations.

Significance for Governance

- **Human Capital Development:** A credible examination system is essential for identifying talent and ensuring efficient utilisation of India's demographic dividend.
- **Good Governance:** Transparent and accountable examinations promote trust in public institutions and strengthen democratic governance.
- **Social Justice:** Fair examinations ensure equal opportunities and prevent socio-economic privilege from undermining merit-based selection.
- **National Competitiveness:** Strong educational and recruitment systems are crucial for building a skilled workforce capable of driving economic growth.

Way Forward

- **Strengthen Institutional Autonomy:** The NTA should be empowered through stronger legal backing, professional staffing, and independent oversight mechanisms.
- **Expand Secure Digital Infrastructure:** Establish dedicated government-controlled testing centres equipped with advanced cybersecurity and surveillance systems.
- **Implement Committee Recommendations:** Time-bound implementation of the Radhakrishnan Committee's reforms can significantly improve examination security and transparency.
- **Leverage Technology:** AI-driven monitoring, biometric authentication, encrypted paper transmission, and

predictive analytics should be integrated into examination processes.

- **Promote Ethical Culture:** Strengthening school education, reducing excessive dependence on coaching, and promoting values of integrity can address the root causes of examination malpractice.
- **Enhance Centre-State Coordination:** Real-time information sharing among central and state agencies is necessary to dismantle organised examination fraud networks.

Conclusion

The NEET-UG 2026 paper leak is not merely an examination irregularity but a challenge to the principles of meritocracy, transparency, and public trust. As India seeks to harness its demographic dividend and build a knowledge-based economy, ensuring the credibility of public examinations becomes a governance imperative. Strengthening institutional capacity, leveraging technology, enforcing strict accountability, and implementing long-pending reforms will be essential to create an examination system that is secure, fair, and worthy of the aspirations of millions of young Indians.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding the Public Examinations (Prevention of Unfair Means) Act, 2024:

1. It applies to examinations conducted by agencies such as UPSC, SSC, RRBs, and NTA.
2. The Act covers offences such as impersonation and unauthorised access to examination systems.
3. The Act directly governs all State Public Service Commission examinations.

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)

Descriptive Question

Q. Examination integrity is fundamental to meritocracy and good governance. Discuss the systemic challenges facing India's examination ecosystem in light of recent paper leak incidents. Suggest measures to strengthen transparency, accountability, and public trust in competitive examinations. (15 Marks, 250 Words).

NFHS-6: Rising Burden of Obesity and Diabetes in India

Why in News: The recently released **National Family Health Survey-6 (NFHS-6) (2023-24)** has reported a significant increase in **obesity and diabetes prevalence** across India, highlighting the growing challenge of **Non-Communicable Diseases (NCDs)** and their implications for public health, economic productivity, and human development.

Key Details

- **Rising Health Concern:** NFHS-6 reveals a sharp increase in obesity and high blood sugar levels among both men and women, indicating a rapid

epidemiological transition from communicable to lifestyle-related diseases.

- **Urban-Rural Divide:** Urban populations continue to record higher prevalence of obesity and diabetes; however, the spread of lifestyle diseases in rural areas suggests that NCDs are becoming a nationwide challenge.
- **Demographic Implications:** The increasing burden of NCDs among the working-age population poses a serious threat to India's demographic dividend and long-term economic growth.
- **Policy Relevance:** The findings underline the need to shift healthcare priorities from treatment-centric approaches to prevention, early diagnosis, and lifestyle modification.

NFHS

- **About NFHS-6:** Conducted by the **Ministry of Health and Family Welfare** with the **International Institute for Population Sciences (IIPS), Mumbai** as the nodal agency, NFHS-6 covered nearly 6.79 lakh households across 715 districts.
- **Importance:** The survey provides critical data on population, nutrition, health, family welfare, gender indicators, and disease burden, serving as an important evidence base for policymaking.

Trends

- **Growing Obesity:** Obesity among women increased from 24% to 30.7%, while obesity among men rose from 22.9% to 27.3% between NFHS-5 and NFHS-6, reflecting changing lifestyles and dietary patterns.
- **Increasing Diabetes:** High blood sugar prevalence has increased significantly among adults, indicating a growing risk of diabetes-related complications and long-term healthcare challenges.

Obesity

- **Meaning:** According to the World Health Organization (WHO), obesity refers to excessive accumulation of body fat that adversely affects health and is generally assessed through the **Body Mass Index (BMI)**.
- **Health Impact:** Obesity is a major risk factor for diabetes, hypertension, cardiovascular diseases,

stroke, musculoskeletal disorders, and certain forms of cancer.

- **Changing Nutrition Profile:** India is increasingly facing a "double burden of malnutrition," where undernutrition coexists with obesity and lifestyle-related disorders.

Diabetes

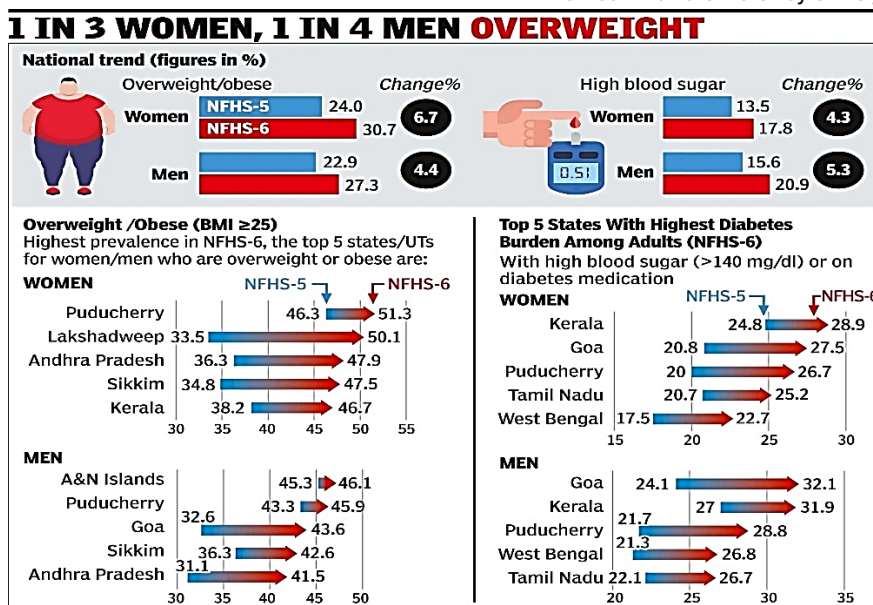
- **Definition:** Diabetes is a chronic metabolic disorder characterised by elevated blood glucose levels due to inadequate insulin production or ineffective insulin utilisation.
- **Major Types:** Type-1 Diabetes, Type-2 Diabetes, and Gestational Diabetes are the major forms of the disease, with Type-2 accounting for the majority of cases in India.
- **Public Health Concern:** According to the ICMR-INDIAB study, India is home to over 10 crore people living with diabetes, making it one of the world's largest diabetes burdens.

Transition

- **Epidemiological Shift:** India is witnessing a transition from communicable diseases towards Non-Communicable Diseases (NCDs) due to urbanisation, changing diets, reduced physical activity, and increasing life expectancy.
- **Lifestyle Factors:** Sedentary lifestyles, excessive screen time, processed food consumption, stress, and inadequate physical activity have emerged as major contributors to obesity and diabetes.

Implications

- **Health Burden:** Rising NCDs increase the incidence of cardiovascular diseases, kidney disorders, blindness, and other chronic illnesses, placing pressure on healthcare systems.
- **Economic Costs:** Long-term treatment and management of diabetes and obesity-related diseases increase out-of-pocket expenditure and strain public health resources.
- **Productivity Loss:** Poor health among the working-age population can reduce labour productivity, workforce participation, and overall economic output.
- **Demographic Dividend:** A growing NCD burden may undermine India's demographic advantage by affecting the health and efficiency of its young population.



Challenges

- **Lifestyle Changes:** Rapid urbanisation and technological dependence have reduced physical activity levels across age groups.
- **Food Environment:** Easy availability of ultra-processed foods rich in sugar, salt, and unhealthy fats has contributed to unhealthy dietary behaviour.
- **Late Detection:** A large proportion of diabetes cases remain undiagnosed until complications arise, reducing treatment effectiveness.
- **Healthcare Gaps:** Rural and semi-urban healthcare systems often lack adequate facilities for regular screening, diagnosis, and management of NCDs.
- **Behavioural Barriers:** Public awareness regarding preventive healthcare, healthy diets, and regular physical activity remains limited.

Initiatives

- **NP-NCD:** The National Programme for Prevention and Control of Non-Communicable Diseases focuses on awareness, screening, early diagnosis, treatment, and follow-up care.
- **Ayushman Bharat:** Health and Wellness Centres under Ayushman Bharat aim to strengthen primary healthcare and improve screening for NCDs.
- **POSHAN Abhiyaan:** The programme seeks to improve nutritional outcomes and promote healthy dietary practices among vulnerable populations.
- **Fit India Movement:** It encourages physical fitness and active lifestyles through initiatives such as Fit India Schools and community-based fitness campaigns.
- **Eat Right India:** Led by FSSAI, the initiative promotes safe and healthy eating habits while encouraging regulation and labelling of unhealthy food products.

Significance

- **Human Capital Development:** Addressing obesity and diabetes is essential for improving health outcomes, educational attainment, and workforce productivity.
- **Sustainable Development Goals (SDGs):** Effective control of NCDs contributes directly to **SDG 3 (Good Health and Well-being)** and indirectly supports broader development objectives.
- **Public Health Security:** Preventing lifestyle diseases is critical for reducing healthcare expenditure and ensuring long-term sustainability of health systems.

Way Forward

- **Preventive Healthcare:** Greater emphasis should be placed on health awareness, behavioural change campaigns, and promotion of healthy lifestyles.
- **Early Screening:** Expanding community-level screening and regular health check-ups can help detect obesity and diabetes before complications develop.
- **Food Regulation:** Stronger regulation and front-of-pack labelling of High Fat, Salt and Sugar (HFSS) foods can promote informed consumer choices.

- **Healthy Urban Planning:** Development of parks, cycling tracks, pedestrian-friendly infrastructure, and recreational spaces can encourage physical activity.
- **Whole-of-Government Approach:** Effective management of NCDs requires coordinated action across health, education, nutrition, urban development, agriculture, and food regulation sectors.

Conclusion

The findings of NFHS-6 indicate that obesity and diabetes are emerging as major public health challenges in India, reflecting broader lifestyle and demographic changes. As the country aspires to harness its demographic dividend and achieve sustainable development, tackling the growing burden of Non-Communicable Diseases must become a policy priority. A comprehensive strategy focused on prevention, early diagnosis, healthier lifestyles, and stronger primary healthcare systems will be crucial to ensuring a healthier and more productive population.

PMOS (Earlier PCOS)

Why in News: Polycystic Ovary Syndrome (**PCOS**) has been officially renamed **Polyendocrine Metabolic Ovarian Syndrome (PMOS)** from May 2026 to better reflect its hormonal and metabolic nature rather than viewing it solely as an ovarian disorder.

About PMOS

- **Definition:** PMOS is a chronic endocrine-metabolic disorder affecting women of reproductive age, characterised by hormonal imbalance, irregular ovulation, and metabolic dysfunction.
- **Why Renamed?** The term "polycystic ovary" was considered misleading as many women do not develop actual ovarian cysts. The new name highlights the condition's broader hormonal, metabolic, and reproductive dimensions.
- **Key Symptoms:** Irregular menstrual cycles, infertility, weight gain, insulin resistance, acne, and hirsutism (excess facial/body hair).
- **Risk Factors:** Genetic predisposition, obesity, sedentary lifestyle, unhealthy diet, and hormonal disturbances increase susceptibility.
- **Indian Context:** PMOS affects nearly **16–18% of Indian women** and is associated with a higher risk of obesity, Type-2 Diabetes, metabolic syndrome, and cardiovascular diseases.

Significance

- **Early Diagnosis:** The revised terminology is expected to improve awareness and reduce underdiagnosis, as nearly 70% of cases remain undetected globally.
- **Holistic Healthcare:** The change encourages treatment approaches addressing metabolic and hormonal health alongside reproductive concerns.

HISTORY & CULTURE

Bhojshala Temple Dispute and Heritage Conservation

Why in News: The Madhya Pradesh High Court declared the Bhojshala-Kamal Maula complex in Dhar as a temple dedicated to Goddess Saraswati and held that the Places of Worship Act, 1991 does not apply to the site as it is protected under the AMASR Act, 1958.

Key Details

- The court quashed the 2003 ASI order that had permitted shared worship by Hindus and Muslims at the site. It granted ASI full administrative and supervisory control over the monument.
- The court held that Section 4(3) of the Places of Worship Act, 1991 exempts monuments protected under the AMASR Act, 1958. Therefore, the freeze on the religious character of places of worship is not applicable to Bhojshala.
- The State government was directed to consider allotment of alternative land for a mosque. This was aimed at balancing religious rights and ensuring complete justice.

Historical Background of Bhojshala (Static: Medieval Indian History)

- Association with Raja Bhoj:** Bhojshala is linked to Raja Bhoj of the Paramara dynasty (11th century CE). It was a renowned centre of Sanskrit learning and housed a temple dedicated to Goddess Saraswati (Vagdevi).
- Centre of Learning:** The site contains Sarpabandha inscriptions depicting Sanskrit grammar and linguistic patterns. These inscriptions highlight the educational and cultural importance of the complex.
- Architectural Significance:** Several carved slabs and inscriptions reflect a blend of Hindu and later Islamic architectural elements. This makes the monument an important example of India's layered heritage.

Places of Worship Act, 1991

- Objective:** The Act seeks to preserve the religious character of places of worship as they existed on 15 August 1947. It aims to prevent fresh disputes over historical religious structures.
- Section 4(3):** Monuments protected under the AMASR Act, 1958 are exempt from the provisions of the Act. Hence, disputes involving protected monuments are treated differently.
- Exception:** The Act does not apply to the Ram Janmabhoomi-Babri Masjid dispute. This exception was explicitly mentioned in the legislation itself.

Places of Worship Act, 1991

Provision	Significance
Status freeze on 15 August 1947	Maintains communal harmony
Bars conversion of religious character	Prevents fresh disputes

Exemption under Section 4(3)	Protected monuments under AMASR Act excluded
Ram Janmabhoomi case	Specifically exempted

Ancient Monuments and Archaeological Sites and Remains Act, 1958

- Purpose:** The Act provides for preservation and protection of monuments of national importance. It empowers ASI to manage and conserve archaeological sites.
- Role of ASI:** ASI regulates access, maintenance, and preservation of protected monuments. It also undertakes archaeological excavations and research activities.
- Conservation Objective:** The Act seeks to safeguard India's cultural heritage from encroachment and damage. It balances preservation with public access.

Raja Bhoj and the Paramara Dynasty

- Patron of Learning:** Raja Bhoj (1010–1055 CE) was a great scholar and patron of art, literature, and architecture. His reign is considered a golden period for Sanskrit learning in central India.
- Capital:** Dhar served as the capital of the Paramara kingdom. The dynasty played a major role in promoting culture and temple architecture.
- Literary Contributions:** Raja Bhoj is credited with works such as Samarangana Sutradhara and Shringara Prakasha. These texts cover architecture, poetry, and aesthetics.

Raja Bhoj

- ✓ Belonged to the **Paramara Dynasty**.
- ✓ Ruled from **Dhar (Malwa region)**.
- ✓ Patron of Sanskrit literature and temple architecture.
- ✓ Associated with **Bhojshala**, a centre of learning dedicated to Goddess Saraswati.
- ✓ Author of **Samarangana Sutradhara**.

Significance of Heritage Conservation

- Protected monuments preserve India's cultural and civilisational legacy. They also promote historical research and tourism.
- Heritage conservation requires balancing historical significance with contemporary sensitivities. Institutions like ASI play a crucial role in ensuring scientific preservation.

Conclusion

The Bhojshala verdict highlights the intersection of heritage conservation, constitutional rights, and religious sensitivities. It also underlines the importance of the AMASR Act, 1958 and the need to preserve India's medieval cultural heritage through scientific and institutional mechanisms.

EXPECTED QUESTION FOR UPSC CSE Prelims MCQ

Q. With reference to the Places of Worship (Special Provisions) Act, 1991, consider the following statements:

1. It preserves the religious character of places of worship as it existed on 15 August 1947.
2. Monuments protected under the Ancient Monuments and Archaeological Sites and Remains Act, 1958 are exempt from its provisions.
3. The Act applies to the Ram Janmabhoomi-Babri Masjid dispute.

How many of the above statements are incorrect?

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

Answer: (a)

GOVERNMENT SCHEMES

JANANI

Why in News: The Ministry of Health and Family Welfare has launched **JANANI (Journey of Antenatal, Natal and Neonatal Integrated Care)** to strengthen maternal and child healthcare through digital monitoring, continuity of care, and real-time service delivery.

Key Details

- **JANANI** is an upgraded version of the Reproductive and Child Health (RCH) Portal. It creates a longitudinal digital health record for women throughout their reproductive life cycle.
- The platform tracks services from pregnancy to newborn and child care. It ensures continuity of care through timely monitoring and interventions.
- QR-enabled digital Mother and Child Health (MCH) Cards have been introduced. These improve portability and easy access to health records across India.
- JANANI integrates digital authentication, real-time monitoring, and programme convergence. This strengthens accountability and service delivery outcomes.

Maternal and Child Health Continuum of Care

- **Comprehensive Coverage:** JANANI covers antenatal care, delivery, postnatal care, newborn care, and family planning services. This ensures that beneficiaries receive healthcare support at every stage.
- **Continuity of Services:** The platform captures all critical health events in a single digital record. This reduces gaps in healthcare delivery and follow-up.
- **Timely Interventions:** Automated tracking helps identify missed services and due beneficiaries. This improves healthcare outreach and service utilization.
- **Improved Outcomes:** Continuous monitoring can contribute to better maternal and child health indicators. It supports reduction in preventable complications and mortality.

Digital Health Governance and Technology Integration

- **QR-enabled MCH Cards:** Digital cards allow quick access to beneficiary health records. This improves portability and accessibility of healthcare information.
- **Unique Identification:** Registration can be done using ABHA, Aadhaar, mobile number, and biometric authentication. This prevents duplication and ensures accurate beneficiary tracking.
- **Self-Registration Facility:** Beneficiaries can register through web and mobile platforms. This promotes citizen participation in healthcare management.
- **Pan-India Accessibility:** Health records can be accessed across states. This is particularly beneficial for migratory populations.

QR-enabled Digital MCH Card

- Acts as a portable digital health record for mother and child.

- Enables quick retrieval of healthcare information across healthcare facilities.
- Reduces paperwork and duplication of records.
- Supports seamless healthcare delivery for migrant beneficiaries.

Real-Time Monitoring and Service Delivery

- **High-Risk Pregnancy Alerts:** The platform generates automated alerts for vulnerable cases. This enables timely medical attention and risk management.
- **Due-List Generation:** Health workers can track pending services and follow-ups. This improves coverage of essential maternal and child healthcare services.
- **Real-Time Dashboards:** Supervisory authorities can monitor programme performance instantly. This enhances accountability and evidence-based decision-making.
- **Targeted Interventions:** Data-driven monitoring helps identify service gaps. This improves efficiency and healthcare outcomes.

Interoperability and Convergence

- **Integration with U-WIN:** JANANI can exchange data with immunization-related digital platforms. This ensures seamless tracking of child vaccination services.
- **Integration with POSHAN:** Data sharing improves nutritional monitoring of beneficiaries. This promotes convergence between health and nutrition programmes.
- **Cross-Sector Coordination:** Multiple government programmes can access relevant beneficiary information. This enhances efficiency and reduces duplication of efforts.
- **Comprehensive Monitoring:** Interoperability provides a holistic view of maternal and child welfare. This strengthens policy implementation and evaluation.

Benefits for Citizens

- **Health Alerts and Reminders:** Beneficiaries receive notifications for check-ups and immunizations. This helps ensure that critical health milestones are not missed.
- **Access to Nearby Facilities:** The platform provides information on healthcare centres and expected place of delivery. This improves healthcare accessibility and preparedness.
- **Health Education Support:** JANANI offers nutritional guidance and awareness information. This promotes informed healthcare decisions.
- **Citizen Empowerment:** Digital access encourages active participation in healthcare management. This supports a patient-centric approach to healthcare delivery.

Achievements So Far

- Over **1.34 crore beneficiary registrations** have been completed. This reflects large-scale adoption of the platform.

- More than **30 lakh pregnant women registrations** have been recorded. This strengthens monitoring of maternal healthcare services.
- Over **30 lakhs digital MCH Cards** have been generated. This demonstrates progress towards digital health record management.
- More than **1 lakh biometric verifications** have been conducted. This enhances authenticity and reliability of beneficiary records.

Way Forward

- **Strengthen digital infrastructure** and last-mile connectivity for wider adoption. This will ensure equitable access across rural and remote areas.
- **Enhance interoperability** with additional healthcare and welfare platforms. This can improve service convergence and beneficiary tracking.
- **Build capacity** among healthcare workers for effective platform utilization. This will maximize the benefits of digital health governance.
- **Promote awareness** among beneficiaries regarding digital healthcare services. This can improve participation and healthcare outcomes.

Conclusion

JANANI represents a major step towards digital governance in maternal and child healthcare. By integrating real-time monitoring, digital health records, and inter-sectoral convergence, it aims to improve service coverage, continuity of care, and health outcomes for mothers and children across India.

PM-AJAY Portal & AJAY Mobile App

Why in News: Union Minister Virendra Kumar launched the **PM-AJAY Portal** and **AJAY Mobile App** to strengthen the implementation, transparency, and monitoring of welfare schemes under the **Pradhan Mantri Anusuchit Jaati Abhyuday Yojana (PM-AJAY)**.

Key Details

- The PM-AJAY Portal and AJAY Mobile App aim to shift from paper-based processes to a fully digital workflow. This will enable faster implementation, real-time monitoring, and improved governance of SC welfare schemes.
- The platform covers Adarsh Gram, Grant-in-Aid (GIA), and Hostel components under PM-AJAY. It integrates planning, implementation, monitoring, and reporting on a single digital platform.
- The portal supports milestone-linked fund flow and digital approval mechanisms. This helps ensure accountability and timely release of funds.
- The initiative promotes transparency, efficiency, and last-mile service delivery. It aligns with the government's vision of digital governance and inclusive development.

PM-AJAY Scheme

- PM-AJAY is a flagship scheme of the Ministry of Social Justice and Empowerment for the socio-economic development of Scheduled Castes (SCs). It focuses on improving livelihood opportunities, education, skill development, and infrastructure in SC-dominated areas.

- The scheme aims to reduce socio-economic disparities and promote inclusive growth. It supports targeted interventions to improve the quality of life of SC communities.

PM-AJAY Portal: Features and Significance

- The portal acts as a central digital platform for planning, monitoring, and fund management. It enables real-time tracking of projects and implementation progress across states and districts.
- For the Adarsh Gram component, it provides dashboards at national, state, and district levels. These dashboards monitor village development through measurable socio-economic indicators.
- The portal automates milestone-based tracking and approvals. This reduces delays and improves transparency in fund utilization.
- For the GIA component, it functions as a Management Information System (MIS). It helps monitor skilling, employment, and livelihood-related interventions.

AJAY Mobile App and Digital Governance

- The AJAY Mobile App enables mobile-based access to scheme-related services and information. Field officials can undertake surveys, prepare Village Development Plans (VDPs), and upload reports digitally.
- The app supports geo-tagging, photo uploads, inspections, and real-time reporting. This enhances accountability and strengthens field-level monitoring.
- It provides role-based access to officials and implementing agencies. This ensures secure and efficient management of data and services.
- The application reduces dependency on manual paperwork and desktop-based systems. It facilitates faster decision-making and better coordination among stakeholders.

Adarsh Gram Component

What is Adarsh Gram under PM-AJAY?

- It focuses on the integrated development of villages with a significant Scheduled Caste population. Village Development Plans (VDPs) are prepared to address local socio-economic needs.
- Development is monitored through **50 socio-economic indicators across 10 developmental domains**.
- The objective is to transform selected villages into model villages through targeted interventions and better service delivery.

Digital Governance and Welfare Delivery

- The initiative reflects the growing use of technology in public administration. Digital platforms improve transparency, efficiency, and citizen-centric governance.
- Real-time monitoring helps identify implementation gaps quickly. This enables timely corrective action and better outcomes.
- Digitalisation also improves data-driven policymaking. It supports evidence-based planning and resource allocation.

Significance for Scheduled Caste Welfare

- The platform strengthens implementation of welfare schemes targeted at SC communities. It ensures better

monitoring of educational, livelihood, and infrastructure-related interventions.

- Improved transparency and accountability can enhance beneficiary trust. This contributes to more effective social justice outcomes.
- The initiative supports the broader goal of inclusive and equitable development. It aligns with constitutional principles of social justice and empowerment.

Conclusion

The PM-AJAY Portal and AJAY Mobile App mark an important step towards digital governance in social welfare administration. By enabling real-time monitoring, transparent fund flow, and improved implementation, the initiative has the potential to strengthen Scheduled Caste welfare and enhance the effectiveness of government interventions.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the Pradhan Mantri Anusuchit Jaati Abhyuday Yojana (PM-AJAY), consider the following statements:

1. PM-AJAY is implemented by the Ministry of Social Justice and Empowerment.
2. The PM-AJAY Portal enables milestone-linked fund flow and real-time monitoring.
3. The Adarsh Gram component is aimed at the development of villages with significant Scheduled Caste population.

How many of the above statements are correct?

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

Answer: (c)

SARTHAK-PDS Scheme

Why in News: The Cabinet Committee on Economic Affairs (CCEA) has approved the continuation of the **SARTHAK-PDS (Scheme for Assistance in Ration Transport and Handling-Income with Automation in PDS)** with a Central outlay of **₹25,530 crore** for the period up to March 2031.

Key Details

- The scheme integrates two existing schemes related to foodgrain transportation, FPS dealer margins, and technology reforms in the Public Distribution System (PDS). It aims to strengthen implementation of the **National Food Security Act (NFSA), 2013** through financial support and digital transformation.
- The scheme will provide assistance for intra-state movement and handling of foodgrains along with fair compensation to Fair Price Shop (FPS) dealers. This is expected to improve last-mile delivery and ensure uninterrupted foodgrain distribution.
- SARTHAK-PDS will operate during the 16th Finance Commission period with continued Central assistance to States and Union Territories. It seeks to enhance efficiency, transparency, and accountability in food distribution.

National Food Security Act (NFSA), 2013

- NFSA provides legal entitlement to subsidized foodgrains to eligible beneficiaries across the country. It

covers about **81.35 crore people**, making it one of the world's largest food security programmes.

- The Act aims to ensure food and nutritional security through access to adequate quantities of quality foodgrains. It forms the foundation of India's rights-based approach to food security.

SARTHAK-PDS: Objectives and Features

- The scheme aims to ensure assured financial support for transportation, handling, and FPS dealer margins. This will strengthen the supply chain and improve service delivery under PDS.
- It seeks to create a unified, citizen-centric and interoperable PDS architecture. This will help reduce leakages and improve monitoring across states.
- The scheme focuses on last-mile delivery of foodgrains to beneficiaries. This is crucial for ensuring effective implementation of food security programmes.

Fair Price Shops (FPS)

What is FPS?

- ❖ Fair Price Shops are retail outlets through which subsidized foodgrains are distributed under the Public Distribution System.
- ❖ They act as the last-mile delivery point between the government and beneficiaries.

Importance

- ❖ Ensure food security for vulnerable populations.
- ❖ Play a critical role in implementation of NFSA.
- ❖ Act as the backbone of the Targeted Public Distribution System (TPDS).

Technology Integration in PDS

- SARTHAK-PDS promotes the use of **Artificial Intelligence (AI), Machine Learning (ML), Natural Language Processing (NLP), and Blockchain** technologies. These technologies will improve transparency, efficiency, and security in food distribution.
- The scheme proposes standardized databases and real-time monitoring systems. This will facilitate data-driven decision-making and timely identification of operational issues.
- AI-driven grievance redressal and analytics systems will enhance citizen services. This can help improve responsiveness and beneficiary satisfaction.

Digital Reforms in Public Distribution System

- India has implemented several digitization initiatives including End-to-End Computerization of TPDS and Integrated Management of PDS (IM-PDS). These reforms have significantly improved transparency in foodgrain distribution.
- Digitization of ration cards, Aadhaar seeding, and e-PoS devices at FPS have reduced duplication and leakages. This has strengthened beneficiary identification and authentication.
- Citizen-centric applications such as Mera Ration, Anna Mitra, Anna Sahayata, and Rightful Targeting Dashboard support transparency. They provide easier access to services and information for beneficiaries.

Significance of SARTHAK-PDS

- The scheme strengthens India's commitment to food and nutritional security. It combines financial support with technological innovation for better outcomes.

- It promotes transparency and accountability in PDS operations through digital governance. This can reduce corruption and improve public trust.
- The scheme supports efficient delivery of foodgrains to beneficiaries across the country. It contributes to inclusive growth and social welfare objectives.

Way Forward

- Strengthen digital infrastructure and cybersecurity safeguards within the PDS ecosystem. This will ensure secure handling of beneficiary data and transactions.
- Enhance capacity building of states and FPS dealers for effective adoption of new technologies. This will improve implementation efficiency across regions.
- Promote continuous monitoring and evaluation using real-time data analytics. This can help identify bottlenecks and improve service delivery.

Conclusion

SARTHAK-PDS represents the next phase of India's food security reforms by integrating financial assistance with advanced technology. By improving transparency, efficiency, and last-mile delivery, the scheme will strengthen implementation of NFSA and ensure food security for millions of beneficiaries.

PMGSY-IV – Transforming Rural Connectivity in India

Why in News: The Ministry of Rural Development celebrated **25 years of Pradhan Mantri Gram Sadak Yojana (PMGSY)** and launched **PMGSY-IV** on 10 May 2026 in Madhya Pradesh. The new phase focuses on technology-driven, green, and inclusive rural infrastructure to strengthen last-mile connectivity.

Key Highlights

- PMGSY completed 25 years of implementation in 2026, marking a major milestone in rural infrastructure development. It has significantly improved connectivity between villages and essential services.
- A symbolic allocation of **₹18,907 crore** was announced for FY 2026–27 under PMGSY. Out of this, **₹830 crore** has been allocated to Madhya Pradesh for rural road development.
- PMGSY-IV aims to connect **25,000 unconnected habitations** through the construction of **62,500 km of roads**. The programme has a total financial outlay of **₹70,125 crore**.
- The scheme aligns with **PM Gati Shakti**, **PM-JANMAN**, and the vision of **Viksit Bharat@2047**. It seeks to promote balanced and inclusive regional development.

What is PMGSY?

- Pradhan Mantri Gram Sadak Yojana (PMGSY) was launched on **25 December 2000**. Its objective is to provide all-weather road connectivity to eligible unconnected rural habitations.
- It is a **Centrally Sponsored Scheme** implemented by the Ministry of Rural Development. The programme has played a key role in reducing rural isolation and improving accessibility.

Constitutional and Governance Basis

- **Article 38** directs the State to reduce inequalities and promote social justice. Improved rural connectivity supports equitable development across regions.
- **Article 40** encourages strengthening village self-governance through Panchayati Raj institutions. Better infrastructure enhances service delivery and local governance.

Important Terms

All-Weather Road

- A paved road that remains motorable throughout the year except during extraordinary situations such as severe floods or landslides.

Habitation

- A cluster of population that serves as the planning unit under PMGSY. It is different from a revenue village.

OMMAS

- Online Management, Monitoring and Accounting System used for real-time monitoring of physical and financial progress under PMGSY.

Evolution of PMGSY

PMGSY-I (2000)

- Focused on providing basic all-weather connectivity to previously unconnected habitations. It helped integrate rural communities with markets and public services.

PMGSY-II (2013)

- Emphasised upgradation and consolidation of existing rural roads. The objective was to improve connectivity with economic and service centres.

Road Connectivity Project for LWE Areas (2016)

- Covered Left Wing Extremism-affected districts to improve accessibility and security. It strengthened socio-economic integration in remote regions.

PMGSY-III (2019)

- Focused on connecting villages with agricultural markets, schools and hospitals. By December 2025, about **83% of the targeted road length** had been completed.

PMGSY-IV (2024–2029)

- Targets construction of **62,500 km of roads** to connect **25,000 unconnected habitations**. It marks a shift towards sustainable and technology-enabled rural infrastructure.

Technology Integration under PMGSY-IV

- Road alignments are being mapped through the **PMGSY Gram Sadak Survey App** and **PM Gati Shakti National Master Plan**. This improves planning efficiency and infrastructure coordination.
- GPS-enabled tracking and digital monitoring systems are being used. These measures enhance transparency, accountability and project execution.
- Performance-linked maintenance payments have been introduced. This encourages better quality construction and long-term road sustainability.

Green Technology and Sustainable Infrastructure

- PMGSY-IV promotes the use of waste plastic, fly ash, cold mix technology and full-depth reclamation. These technologies reduce environmental impact and support circular economy principles.
- By July 2025, more than **1.24 lakh km of rural roads** had been built using green technologies. This demonstrates India's growing emphasis on sustainable infrastructure development.

Economic Significance

- Rural roads improve access to markets and reduce transportation costs. This helps farmers secure better prices and enhances rural incomes.
- Improved connectivity promotes non-farm employment opportunities. It supports diversification of the rural economy and inclusive growth.

Social Significance

- Better roads improve access to schools and healthcare facilities. This contributes to higher educational attainment and improved health outcomes.
- Enhanced connectivity increases mobility for women and vulnerable groups. It strengthens social inclusion and access to government services.

Security and Strategic Importance

- Rural roads in Left Wing Extremism-affected areas improve administrative reach. They facilitate effective delivery of welfare schemes and public services.
- Better infrastructure supports internal security operations and emergency response. This contributes to overall regional stability and development.

Way Forward

- Strengthen integration with digital platforms and geospatial technologies. This will improve planning, monitoring and maintenance of rural roads.
- Expand the use of green construction materials and sustainable practices. This will support India's climate and environmental commitments.
- Enhance Centre-State coordination for timely implementation. Effective cooperative federalism is essential for achieving connectivity goals.

Conclusion

PMGSY has transformed rural India by connecting villages to markets, schools, hospitals and economic opportunities. PMGSY-IV represents the next phase of rural transformation through technology-driven, green and inclusive infrastructure, contributing to the vision of **Viksit Bharat@2047**.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the Pradhan Mantri Gram Sadak Yojana (PMGSY), consider the following statements:

1. PMGSY was launched in 2000 to provide all-weather road connectivity to eligible rural habitations.
2. PMGSY-IV aims to connect 25,000 unconnected habitations through 62,500 km of roads.
3. OMMAS is a platform used for satellite communication in remote villages.

How many of the above statements are incorrect?

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

Answer: (a)

Bharat Audyogik Vikas Yojna (BHAVYA)

Why in News: The Department for Promotion of Industry and Internal Trade has released the operational guidelines for the **Bharat Audyogik Vikas Yojna (BHAVYA)** to develop world-class industrial smart cities across India.

Key Details

- **BHAVYA** is a Central Sector Scheme aimed at creating investment-ready and plug-and-play industrial parks. It seeks to attract domestic and global manufacturers by reducing infrastructure and regulatory bottlenecks.
- The scheme has a total outlay of **₹33,660 crore** and will be implemented from FY 2026-27 to FY 2031-32. It is expected to strengthen India's manufacturing capacity and industrial competitiveness.
- The scheme will be implemented by the **National Industrial Corridor Development Corporation (NICDC)** under DPIIT. It will support the vision of *Make in India* and *Aatmanirbhar Bharat*.
- The first phase will select **50 industrial parks** through a challenge-based competitive mechanism among States and UTs. This ensures transparency and performance-based allocation of resources.

BHAVYA Scheme

- **Objective:** To establish modern industrial parks with ready infrastructure and seamless logistics connectivity. It aims to reduce the cost and time required for setting up manufacturing units.
- **Manufacturing-Led Growth:** The scheme promotes industrialisation as a driver of economic growth and employment generation. It aligns with India's goal of increasing the manufacturing sector's contribution to GDP.
- **Ease of Doing Business:** Plug-and-play infrastructure will reduce procedural delays for investors. This will improve India's attractiveness as a global manufacturing destination.
- **Regional Development:** Industrial parks will promote balanced regional growth and reduce concentration in existing industrial hubs. It can help integrate backward regions into national supply chains.

Industrial Corridors in India

Industrial Corridor: A planned infrastructure network integrating industries with transport and logistics facilities.

Major Industrial Corridors:

- ❖ Delhi-Mumbai Industrial Corridor
- ❖ Chennai-Bengaluru Industrial Corridor
- ❖ Amritsar-Kolkata Industrial Corridor
- ❖ East Coast Economic Corridor

Significance:

- ❖ Boost manufacturing and exports.
- ❖ Generate employment opportunities.
- ❖ Improve logistics efficiency and regional connectivity.
- ❖ Support India's goal of becoming a global manufacturing hub.

Key Features of BHAVYA

- **Development of 100 Industrial Parks:** The scheme targets the establishment of 100 industrial parks across the country. The initial phase will focus on 50 parks selected through a competitive framework.
- **Financial Assistance:** Assistance up to ₹1 crore per acre will be provided for park development. The scheme also supports up to 25% of external infrastructure costs.
- **Challenge-Based Selection:** States will be evaluated based on objective criteria such as sustainability and ecosystem readiness. This encourages competition and efficient project implementation.
- **SPV-Based Implementation:** Projects will be executed through Special Purpose Vehicles (SPVs) under the Companies Act, 2013. This ensures professional management and accountability.

Infrastructure Components under BHAVYA

- **Core Infrastructure:** Includes roads, utility corridors, drainage systems, and Common Effluent Treatment Plants (CETPs). These facilities create a strong foundation for industrial operations.
- **Value-Added Infrastructure:** Includes factory sheds, testing laboratories, and logistics warehouses. These reduce initial investment costs for industries.
- **Social Infrastructure:** Worker housing, healthcare centres, and skill development facilities are included. This promotes sustainable industrial development and workforce welfare.
- **Integrated Planning:** Infrastructure is designed to support long-term industrial expansion. It helps create self-sustaining industrial ecosystems.

Implementation Framework

- **Land Requirement Norms:** A minimum of 100 acres is required for most states and 25 acres for hilly and northeastern regions. This ensures adequate scale and viability of industrial projects.
- **PM GatiShakti Integration:** All parks must be linked with the PM GatiShakti National Master Plan. This will improve multimodal connectivity and logistics efficiency.
- **Public-Private Partnership (PPP):** Private developers can participate through project-specific SPVs. This will mobilise additional investment and expertise.
- **Technology-Based Monitoring:** GIS and satellite-based tools will track project implementation. This enhances transparency and timely execution.

BHAVYA SCHEME

BHARAT AUDYOGIK VIKAS YOJNA

Central Sector Scheme for development of **100 investment-ready plug-and-play industrial parks**

Scheme duration: 6 years (FY 2026-27 to 2031-32) with financial outlay of **₹33,660 crore**

Central Government funding **support upto ₹1 crore per acre**

Historic Decision by Modi Govt

Significance for India's Economy

- **Boost to Manufacturing:** The scheme supports India's ambition of becoming a global manufacturing hub. It can attract investments under the China+1 strategy.
- **Employment Generation:** New industrial parks will create direct and indirect employment opportunities. This can contribute significantly to inclusive economic growth.
- **Export Competitiveness:** Improved logistics and infrastructure will lower production costs. This can enhance India's export performance in global markets.
- **MSME Integration:** Industrial parks can facilitate linkages between large industries and MSMEs. This will strengthen domestic value chains and industrial ecosystems.

Challenges

- **Land Acquisition Issues:** Acquiring large contiguous land parcels may face local resistance. It can delay project implementation and increase costs.
- **Environmental Concerns:** Industrial expansion may affect ecosystems if sustainability safeguards are weak. Balancing growth and environmental protection remains important.
- **Inter-Governmental Coordination:** Successful implementation requires cooperation between Centre and States. Administrative delays may affect project timelines.
- **Infrastructure Financing:** Sustained financial support will be necessary for long-term success. Effective utilisation of funds will be critical.

Way Forward

- Ensure faster land availability through transparent and participatory mechanisms. This can reduce delays and improve stakeholder acceptance.

- Promote green industrial infrastructure and renewable energy integration. This will support sustainable industrial development.
- Strengthen skill development programmes around industrial clusters. This will create a skilled workforce for future industries.
- Enhance coordination between industrial corridors, logistics networks, and industrial parks. This can maximise economic benefits and investment attraction.

Conclusion

BHAVYA marks a significant step towards creating a modern manufacturing ecosystem in India. By combining world-class infrastructure, logistics connectivity, and transparent governance, the scheme can accelerate industrial growth, boost employment, and strengthen India's position in global value chains.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the Bharat Audyogik Vikas Yojna (BHAVYA), consider the following statements:

1. It is a Central Sector Scheme implemented by DPIIT.
2. The scheme aims to develop plug-and-play industrial parks across India.
3. All industrial parks under BHAVYA must be integrated with the PM GatiShakti National Master Plan.

How many of the above statements are incorrect?

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

Answer: (a)

IMPORTANT REPORTS

NCRB Crime in India Report 2024

Why in News: The National Crime Records Bureau released the **Crime in India 2024** report, which showed a 6% decline in overall cognisable crimes but a sharp 17% rise in cybercrimes. This highlights the growing challenge of digital crimes and the need for stronger cyber governance.

Key Details

- **Overall cognisable crimes declined by 6% in 2024.**
 - The decline was partly due to changes introduced under the Bharatiya Nyaya Sanhita, 2023, which made simple hurt a non-cognisable offence.
- **Cybercrime emerged as the fastest-growing category.**
 - Reported cybercrime cases crossed one lakh, reflecting a shift from conventional crimes to technology-driven offences.
- **Crimes against vulnerable sections remain a concern.**
 - Cases involving children, senior citizens, and economic offences witnessed an increase despite the overall decline.
- **Digital frauds and AI-enabled scams are expanding rapidly.**
 - Fraudsters are increasingly using deepfakes, phishing, and voice cloning techniques to target citizens.

National Crime Records Bureau

- **Establishment and Mandate:** NCRB was established in 1986 under the Ministry of Home Affairs. It acts as the national repository of crime and criminal-related data for evidence-based policymaking.
- **Major Publications:** NCRB publishes Crime in India, Prison Statistics India, and Accidental Deaths and Suicides in India reports. These reports are widely used for judicial review and policy formulation.
- **Digital Initiatives:** NCRB manages CCTNS, NAFIS and the National Database of Sexual Offenders. These initiatives strengthen information sharing and criminal identification.
- **Policy Significance:** NCRB data helps governments identify trends and allocate resources efficiently. It also assists in evaluating the effectiveness of laws and governance mechanisms.

Cybercrime Epidemic in India

- **Sharp Rise in Cybercrime:** Cybercrime cases increased by 17% in 2024. Digital transactions and internet penetration have expanded the attack surface for criminals.

- **Fraud as the Major Motive:** Most cybercrimes are related to cheating, phishing and financial fraud. These crimes cause significant financial losses and undermine public trust.
- **AI-enabled Crimes:** Criminals are using artificial intelligence for deepfakes and voice cloning. Such technologies make scams more sophisticated and difficult to detect.
- **Under-reporting Remains High:** Many cases remain unreported due to lack of awareness and social stigma. This creates a gap between actual and recorded cybercrime figures.

Digital Arrest Fraud

Digital Arrest refers to a scam in which fraudsters impersonate officials from agencies such as the police, CBI or customs through video calls and threaten victims with arrest to extort money.

Key Features

- Based on fear and psychological manipulation.
- Often uses forged documents and AI-generated voices.
- Senior citizens and digitally unaware persons are highly vulnerable.
- Represents a new form of social engineering attack.

Factors Driving Cybercrime Surge

- **Expansion of Digital Infrastructure:** Rapid growth of UPI, fintech and digital services has increased vulnerabilities. Cybersecurity measures have not expanded at the same pace as digital adoption.
- **Low Digital Literacy:** A large section of the population lacks awareness regarding cyber frauds. This makes users vulnerable to phishing and social engineering attacks.
- **Organised Criminal Networks:** Cybercrime has evolved into organised syndicates operating across states and borders. They use fake SIM cards, mule bank accounts and encrypted communication.
- **Cross-border Nature of Crime:** Many scams originate outside India's jurisdiction. This makes investigation and recovery of stolen funds difficult.

Challenges in Cyber Governance

- **Police is a State Subject:** Differences in capabilities among states create uneven responses to cyber threats. Coordination issues often delay investigations.
- **Shortage of Skilled Professionals:** India faces a shortage of cyber forensic experts and ethical hackers. This results in delays and low conviction rates.
- **Rapid Technological Changes:** Emerging technologies evolve faster than regulatory mechanisms. Traditional policing methods are inadequate to tackle AI-driven threats.

- **Threat to Critical Infrastructure:** Sectors such as banking, power and telecommunications are increasingly vulnerable. Cyberattacks on these sectors can affect national security and economic stability.

Institutional Framework for Cyber Security

- **Indian Cyber Crime Coordination Centre (I4C):** It acts as the nodal agency for combating cybercrime. It promotes coordination among states and law-enforcement agencies.
- **CERT-In:** It is responsible for responding to cyber security incidents. The agency provides alerts, advisories and incident response mechanisms.
- **CCTNS:** It links police stations across the country through a digital platform. This facilitates faster sharing of investigation data.
- **National Cyber Security Policy, 2013:** It aims to create a secure cyber ecosystem. However, it needs updating to address emerging AI-driven threats.

Way Forward

- **Strengthen Cyber Institutions:** I4C should be empowered with better resources and coordination mechanisms. Specialised cyber units need to be established in all states.
- **Promote Digital Literacy:** Awareness campaigns should focus on digital hygiene and safe online practices. Citizens can become the first line of defence against cyber fraud.
- **Use AI for Cyber Defence:** Artificial intelligence can help in predictive threat detection and fraud analysis. This will improve the speed and effectiveness of responses.
- **Enhance International Cooperation:** Cybercrimes require cross-border intelligence sharing and legal cooperation. Global collaboration is essential to tackle transnational cyber networks.

Conclusion

The NCRB Crime in India 2024 report highlights that India's security challenges are increasingly shifting from physical crimes to digital threats. Strengthening cyber governance, enhancing digital literacy, and building institutional capacity are essential for ensuring a secure and resilient digital ecosystem.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to cyber security in India, consider the following statements:

1. The National Crime Records Bureau functions under the Ministry of Electronics and Information Technology.
2. CERT-In is the nodal agency for responding to cyber security incidents in India.
3. Crime and Criminal Tracking Network and Systems (CCTNS) is implemented by the National Crime Records Bureau.

How many of the above statements are incorrect?

- (a) Only one
- (b) Only two

(c) All three

(d) None

Answer: (a)

International Big Cat Alliance (IBCA) Summit 2026

Why in News: India will host the **1st International Big Cat Alliance (IBCA) Summit** in New Delhi on **1-2 June 2026**. The summit is expected to adopt the **Delhi Declaration**, the first global declaration dedicated to big cat conservation.

Key Details

- **Theme:** "Save Big Cats, Save Humanity, Save Ecosystem." The summit aims to strengthen international cooperation for protecting big cats and their habitats.
- **Delhi Declaration:** It seeks to promote shared priorities, transboundary conservation, and a landscape-based approach. It is expected to become an important framework for global wildlife conservation.
- **Global Platform:** The summit will bring together member countries, observers, and range countries. It highlights India's leadership in biodiversity conservation.

International Big Cat Alliance (IBCA)

- **Origin:** IBCA was launched in 2023 during the 50th anniversary of Project Tiger and approved by the Union Cabinet in 2024. It reflects India's commitment to global wildlife conservation and ecological diplomacy.
- **Implementation:** It is implemented through the National Tiger Conservation Authority (NTCA) under the Ministry of Environment, Forest and Climate Change. The alliance serves as a platform for technical cooperation and knowledge sharing.
- **Membership:** All UN member countries are eligible to join the alliance. At present, it comprises 24 member countries and 5 observer countries.
- **Funding Support:** India has committed ₹150 crore for the period 2023-2028. Additional resources are expected through bilateral and multilateral partnerships.

Need for Global Big Cat Conservation

- **Habitat Loss:** Expansion of agriculture, infrastructure, and urbanisation is reducing natural habitats. Fragmentation of ecosystems threatens the long-term survival of big cat populations.
- **Poaching and Illegal Trade:** Demand for body parts and wildlife products continues to endanger species. International cooperation is necessary to curb transnational wildlife crime.
- **Human-Wildlife Conflict:** Increasing interaction between humans and wildlife causes loss of lives and livelihoods. Scientific management and community participation are essential for coexistence.
- **Climate Change:** Altered ecosystems and changing prey availability affect big cat habitats. Conservation strategies need to incorporate climate resilience.

Seven Big Cat Species under IBCA

- ◆ Tiger
- ◆ Lion
- ◆ Leopard
- ◆ Snow Leopard
- ◆ Cheetah
- ◆ Jaguar
- ◆ Puma

Conservation Initiatives in India (Static + Current)

- **Project Tiger (1973):** It is the flagship programme for tiger conservation in India. India currently hosts more than 70% of the world's wild tiger population.
- **National Tiger Conservation Authority (NTCA):** It provides statutory support for tiger conservation. It also coordinates implementation of major wildlife protection programmes.

- **Project Cheetah:** It aims to reintroduce cheetahs into suitable habitats in India. The programme seeks to restore ecological balance and biodiversity.
- **Protected Area Network:** National parks, wildlife sanctuaries and biosphere reserves provide habitat security. These areas play a critical role in ecosystem conservation.

Significance of IBCA

- **Global Cooperation:** Big cats often inhabit transboundary landscapes requiring coordinated conservation efforts. IBCA can facilitate technology transfer and capacity building among countries.
- **Ecological Importance:** Big cats are apex predators and maintain ecological balance. Their conservation ensures the protection of entire ecosystems.
- **India's Soft Power:** Hosting the summit strengthens India's role in environmental diplomacy. It complements India's efforts under Mission LiFE and biodiversity commitments.

Conservation Status of Big Cats

Species	Scientific Name	IUCN Red List	CITES	Indian Wildlife (Protection) Act, 1972
Tigers	<i>Panthera tigris</i>	Endangered	Appendix-I	Schedule-I
Lions	<i>Panthera leo</i>	Vulnerable	Appendix-I	Schedule-I
Leopards	<i>Panthera pardus</i>	Vulnerable	Appendix-I	Schedule-I
Snow Leopards	<i>Panthera uncia</i>	Vulnerable	Appendix-I	Schedule-I
Pumas	<i>Puma concolor</i>	Least Concerned	Appendix II (P. c. Costaricensis and cougar: Appendix-I)	NA
Jaguars	<i>Panthera onca</i>	Near Threatened	Appendix-I	NA
Cheetahs	<i>Acinonyx jubatus</i>	Vulnerable	Appendix-I	Schedule-I

Other Conservation Efforts in India

- Project Tiger (1973)
- Project Snow Leopard (2009)
- Asiatic Lion Reintroduction Project (2004)
- Project Cheetah (2022)

Way Forward

- Promote landscape-level conservation and transboundary cooperation. Such an approach ensures habitat connectivity and species survival.
- Strengthen anti-poaching measures and community participation. Local communities are key stakeholders in wildlife conservation.
- Enhance research, monitoring, and use of technology. Data-driven conservation can improve management effectiveness.

- Mobilise international funding and technical support. Global collaboration is essential for reversing biodiversity loss.

Conclusion

The International Big Cat Alliance represents India's vision of combining conservation with international cooperation. Protecting big cats not only preserves biodiversity but also ensures ecosystem stability and sustainable development.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the International Big Cat Alliance (IBCA), consider the following statements:

1. It was launched during the 50th anniversary of Project Tiger in 2023.
2. It is implemented through the National Tiger Conservation Authority under the Ministry of Environment, Forest and Climate Change.
3. The alliance focuses on the conservation of eight species of big cats.

How many of the above statements are incorrect?

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

Answer: (a)

Personalities in News

Rabindranath Tagore Jayanti 2026

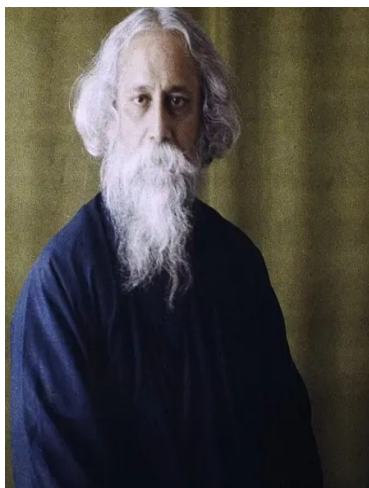
Why in News: India is observing the **165th birth anniversary of Rabindranath Tagore**, reviving discussions on his intellectual debates with Mahatma Gandhi over nationalism, education, modernity, and the symbolic role of the charkha in India's freedom struggle.

Key Details

- **Rabindranath Tagore and Mahatma Gandhi shared a deep friendship despite major ideological differences.** Their debates reflected two distinct visions of India's political, economic, and cultural future during the freedom movement.
- **The charkha became the central symbol of disagreement between the two leaders in the 1920s.** Gandhi viewed spinning as a moral and economic duty, while Tagore feared excessive uniformity and symbolic politics.
- **Tagore criticised blind nationalism and excessive mass conformity in political movements.** He believed India's progress depended on intellectual freedom, creativity, and openness to global ideas.
- **The Gandhi–Tagore debate remains highly relevant in contemporary discussions on nationalism, development, and education.** It provides important insights into balancing tradition with modernity in democratic societies.

Rabindranath Tagore: Life and Major Contributions

- **Birth and Background:** Rabindranath Tagore was born on 7 May 1861 in Calcutta into the culturally influential Tagore family. He emerged as a poet, philosopher, educationist, novelist, composer, and social thinker during the Bengal Renaissance.
- **First Asian Nobel Laureate:** He became the first Asian to receive the Nobel Prize in Literature in 1913 for *Gitanjali*. His literary works introduced Indian spiritual and philosophical traditions to global audiences.
- **National Anthem Contribution:** Tagore composed “Jana Gana Mana”, India's national anthem, and also



authored **Bangladesh's national anthem “Amar Sonar Bangla”**. This reflects his lasting cultural influence across South Asia.

- **Founder of Visva-Bharati University: He established Visva-Bharati University at Santiniketan in 1921.** The institution aimed to combine Indian traditions with global learning and humanist values.

Tagore and Gandhi: Intellectual Relationship

- **Mutual Respect:** Gandhi called Tagore the “Gurudev”, while Tagore referred to Gandhi as “Mahatma”. Despite disagreements, both respected each other's contribution to India's moral and political awakening.
- **Differences in Nationalism:** Gandhi promoted mass mobilisation and swadeshi as tools against colonialism. Tagore warned that aggressive nationalism could suppress individual freedom and critical thinking.
- **Debate on Non-Cooperation Movement:** Tagore feared that emotional nationalism could turn into blind conformity. However, he strongly condemned colonial injustice, including the Jallianwala Bagh Massacre, after which he renounced his knighthood.
- **Shared Objective, Different Methods:** Both leaders sought India's dignity and self-reliance. Yet their methods differed significantly regarding education, economics, and social transformation.

The Charkha Debate and Its Significance

- **Gandhi's View of Charkha:** Gandhi saw the charkha as a symbol of self-reliance, dignity of labour, and resistance to British industrial imports. He believed spinning khadi would economically empower villages and morally discipline citizens.
- **Tagore's Criticism:** Tagore opposed making spinning a compulsory political ritual for all Indians. He argued that human creativity and diversity could not be reduced to a single symbolic activity.
- **Concern over Uniformity:** Tagore feared excessive emphasis on charkha would encourage blind obedience. He believed true freedom required intellectual independence and freedom of thought.
- **Debate on Modernity:** Tagore supported scientific advancement and global exchange of knowledge. He warned that rejecting technology and industrial progress could weaken India economically.

Tagore's Educational Philosophy

- **Holistic Education:** Tagore believed education should nurture creativity, imagination, and moral development. He opposed rote learning and rigid colonial-style classroom systems.

- **Learning through Nature:** Santiniketan promoted open-air education and harmony with nature. This reflected Tagore's belief that learning should be experiential and spiritually enriching.
- **Internationalism in Education:** He encouraged interaction between Eastern and Western traditions. His educational model aimed to create globally aware yet culturally rooted individuals.
- **Relevance Today:** Modern debates on multidisciplinary learning and experiential education reflect Tagore's vision. The principles of the National Education Policy echo several aspects of his philosophy.
- **Education Reforms:** Tagore's emphasis on creativity and holistic learning remains significant today. It aligns with efforts to move beyond rote-based education systems.
- **Pluralism and Democracy:** Tagore's humanist philosophy supports constitutional values of diversity and tolerance. This is particularly relevant in increasingly polarised societies.
- **Sustainable Development:** Gandhi's local self-reliance and Tagore's human-centred modernity both inform sustainable policy debates. Together, they offer complementary perspectives for India's future.

Tagore's Views on Nationalism and Humanism

- **Critique of Aggressive Nationalism:** Tagore believed extreme nationalism could lead to violence and intolerance. He prioritised universal human values above narrow political identities.
- **Concept of Universal Humanism:** He advocated harmony among cultures and civilisations. His ideas promoted peace, cooperation, and global cultural dialogue.
- **Freedom of Mind:** Tagore emphasised intellectual liberty and independent thinking. His famous prayer "Where the mind is without fear" symbolises this aspiration.
- **Contemporary Relevance:** In a polarised world, Tagore's humanism remains highly relevant. His ideas support inclusive nationalism and democratic pluralism.

Tagore's Contribution to India's Freedom Movement

- **Cultural Nationalism:** Tagore inspired patriotism through literature, songs, and art rather than direct political mobilisation. His works strengthened India's cultural confidence during colonial rule.
- **Renunciation of Knighthood:** After the Jallianwala Bagh massacre in 1919, Tagore renounced the title "Sir" awarded by the British Crown. This became a powerful moral protest against colonial repression.
- **Promotion of Rural Reconstruction:** Through Sriniketan, he promoted rural development and self-sufficiency. He believed India's progress depended on empowering villages through education and cooperation.
- **Influence on Indian Thinkers:** His ideas shaped leaders, artists, and educationists across generations. His contributions extended beyond politics into culture, ethics, and social reform.

Contemporary Relevance for India

- **Debate on Development Models:** The Gandhi-Tagore debate continues in discussions on tradition versus modernity. It highlights the challenge of balancing economic growth with ethical and cultural concerns.

Way Forward

- **Promote Value-Based Education:** India should integrate creativity, ethics, and critical thinking into education systems. This would strengthen democratic citizenship and innovation.
- **Balance Tradition with Technology:** Policymaking should combine cultural rootedness with scientific progress. This reflects the complementary strengths of Gandhi and Tagore's visions.
- **Strengthen Cultural Literacy:** Greater awareness of Indian intellectual traditions can deepen civic understanding. Tagore's writings remain valuable for debates on nationalism and humanity.
- **Encourage Inclusive Nationalism:** India's development should remain anchored in pluralism and constitutional morality. This aligns with Tagore's universalist outlook and democratic ideals.

Conclusion

The debate between Gandhi and Tagore over the charkha represented a deeper philosophical dialogue about India's future. While Gandhi stressed discipline, self-reliance, and mass mobilisation, Tagore defended creativity, individuality, and openness to the world. Together, their ideas continue to shape India's discourse on nationalism, education, democracy, and development.

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. The debate between Rabindranath Tagore and Mahatma Gandhi on the charkha reflected deeper ideological differences regarding nationalism, modernity, and individual freedom. Discuss critically in the context of India's freedom struggle. (250 words, 15 marks)

Maharana Pratap Jayanti

Why in News: Recently, the Prime Minister of India paid rich tributes to **Maharana Pratap** on his birth anniversary (**Jayanti**), remembering him as an immortal symbol of exemplary bravery, patriotism, and unyielding self-respect.

Key Details

- **Birth & Lineage:** Born on **9th May 1540** in the Kumbhalgarh Fort, Rajasthan. He was the 13th Rajput ruler of the Kingdom of Mewar.
- **Parentage:** He was the eldest son of **Maharana Udai Singh II** and Rani Jeevant Kanwar.
 - **Note for Prelims:** Maharana Udai Singh II was the founder of the strategic city of **Udaipur**, shifting the administrative focus from Chittor.
- **Military Warfare Style:** Maharana Pratap is widely recognized as one of the earliest pioneers of **Guerrilla Warfare** in the Indian subcontinent, effectively utilizing the rugged terrain of the Aravalli range against numerically superior imperial forces.
- **The Faithful Companion:** Historical records heavily emphasize his loyal warhorse, **Chetak**, who sacrificed his life while carrying the wounded King to safety from the battlefield of Haldighati.
- **Succession:** He passed away on 19th January 1597 due to injuries sustained in a hunting accident. He was succeeded by his eldest son, **Rana Amar Singh I**, who eventually entered into a conditional treaty with Mughal Emperor Jahangir in 1614 to maintain Mewar's internal autonomy.

Historical Context & Battles: For Mains Revision

1. The Battle of Haldighati (18th June 1576)



- **The Conflict:** Fought between the forces of Mewar led by Maharana Pratap and the imperial Mughal forces under the command of **Raja Man Singh I of Amber**, a trusted general of Mughal Emperor Akbar.
- **Strategic Outcome:** Though the Mughal forces held numerical superiority and technical artillery advantages causing heavy casualties to the Mewar army, they failed

to capture or kill Maharana Pratap. Pratap escaped into the hills to regroup his forces.

2. The Battle of Dewair (1582) and Re-establishment of Rule

- **The Turning Point:** In 1582, Maharana Pratap launched a decisive offensive against the Mughal military outposts in Mewar at the **Battle of Dewair**.
- **Geopolitical Shift:** Following Akbar's shift of focus toward the North-West frontier after 1579, Pratap took advantage of the structural gap. He systematically recaptured Western Mewar—including Udaipur, Kumbhalgarh, and Gogunda—leaving only Chittor and Mandalgarh under Mughal control.
- **New Capital:** He established his new administrative capital at **Chavand** (near Dungarpur), transforming it into a vibrant hub for art, architecture, and manuscript illustration.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. Consider the following statements regarding Maharana Pratap:

1. He was a contemporary of the Mughal Emperor Akbar.
2. He established his new capital at Chavand after the Battle of Dewair.
3. He was the founder of the city of Udaipur.

Which of the statements given above is/are correct?

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

Answer: (b)

Raja Rammohan Roy

Why in News: The Union Home Minister recently paid tribute to Raja Rammohan Roy on his birth anniversary, highlighting his monumental role in modernizing the Bengali language, countering deep-seated social superstitions, and establishing the Brahma Samaj.

1. Biographical Profile & Intellectual Foundations



- **Historical Monikers:** Widely acclaimed as the "**Father of Modern India**", the "**Father of the Bengal Renaissance**", and a "*luminous star in the firmament of Indian history*" (as hailed by Rabindranath Tagore).
- **Linguistic Polyglot:** Possessed deep fluency in multiple languages. He mastered **Persian and Arabic** in Patna (where he read the Quran, Arabic translations of Aristotle and Plato, and Sufi poetry) and **Sanskrit** in Varanasi (where he studied Hindu scriptures). He was also fluent in Bengali, English, Hebrew, Greek, and Latin.
- **Administrative Career:** Before turning into a full-time reformer in 1814, he worked in the Revenue Department of the East India Company (1809–1814) as a personal *Diwan* to British officers John Digby and Thomas Woodforde.
- **The Title of 'Raja':** The title "Raja" was conferred upon him by the Mughal Emperor **Akbar Shah II** (Akbar II) in 1831, when Roy was sent to England as an envoy to lobby for the Emperor's pension and allowances.

2. Socio-Religious Reforms & Institutional Frameworks

A. Crusades for Social Justice

- **Abolition of Sati:** Launched a relentless intellectual and grassroots campaign against widow burning (*Sati*). He proved through ancient Hindu scriptures that the practice lacked religious sanction. His sustained activism provided the essential socio-political backing to Governor-General **Lord William Bentinck**, who officially enacted the **Sati Regulation Act XVII of 1829**.
- **Women's Rights:** Strongly vociferated against polygamy, child marriage, and the subhuman treatment of widows. He demandingly campaigned for women's literacy and advocated for their legal right to inherit property.
- **Opposition to Caste System:** Attacked the rigidities of the Hindu caste hierarchy and untouchability, arguing that social inequality fractured national unity.

B. Theological Shift & Evolution of Brahmo Samaj

- **Monotheistic Philosophy:** Strongly influenced by Islamic monotheism and Upanishadic philosophy. He published ***Tuhfat-ul-Muwahhidin (A Gift to Monotheists)*** in 1803, defending the concept of a single, universal God and criticizing idol worship.
- **Chronology of Institutional Innovations:**
 - ✓ **Atmiya Sabha (1814):** Formed in Calcutta to conduct discussions on theological monotheism and campaign against meaningless rituals.

- ✓ **Calcutta Unitarian Association (1821):** Established to bring together reforms cutting across traditional religious divides.
- ✓ **Brahmo Sabha / Brahmo Samaj (1828):** Founded alongside Dwarkanath Tagore to practice the worship of an eternal, unsearchable, and immutable God.
- **Core Tenets of Brahmo Samaj:** It strictly **prohibited image/idol worship, priesthood, and animal sacrifices**. It focused purely on prayers, meditation, and reading of the Upanishads. It aimed at purging Hinduism of its evils rather than creating a separate religion.

3. Educational Upgradation & Western Synthesis

- **Modernization Model:** Roy strongly believed that a synthesis of Western scientific education and Indian philosophical thought was mandatory to liberate the Indian intellect from dogmatic orthodoxy.
- **Institutional Frameworks Assisted:**
 - **Hindu College (1817):** Supported the initiative of **David Hare** and Sir Hyde East to establish this elite institution in Calcutta to impart Western sciences and humanities.
 - **Anglo-Hindu School (1822):** Founded his own school to teach mechanics, astronomy, and the progressive philosophy of Voltaire.
 - **Vedanta College (1825):** Established an academy where courses combined traditional Indian learning (monotheistic Vedanta philosophy) with Western physical and social sciences.

4. Political & Nationalist Contributions (Pre-INC Era)

Though he passed away half a century before the formation of the Indian National Congress (INC), Roy is considered the **Pioneer of Indian Nationalism** due to his early constitutional and administrative demands:

- **Pioneer of Free Press:** Strongly opposed the Press Regulations of 1823. He utilized the media to form public opinion and founded iconic journals:
 - **Sambad Kaumudi (1821):** A weekly Bengali newspaper advocating social reforms and the abolition of Sati.
 - **Mirat-ul-Akhbar (1822):** It was the first Persian-language journal founded and edited by an Indian.
 - **Brahmanical Magazine (1821):** Launched to defend Hindu philosophy against orthodox Christian missionary attacks.

• **Administrative Reforms Demanded:**

- **Separation of Powers:** Demanded the segregation of the executive branch from the judiciary.
- **Indianization of Services:** Agitated for the inclusion of Indians in superior civil and military services to reduce racial discrimination.
- **Peasant Protection:** Called for fixed rent limits for cultivators to save them from the oppressive extractions of Zamindars.
- **Economic Nationalism:** Protested against the East India Company's trade monopolies and high export tariffs placed on Indian textiles entering Britain.

Quick Facts for Revision:

Dimension	Key Fact
1803 Publication	Tuhfat-ul-Muwahhidin (A Gift to Monotheists) - Persian
1809–1814 Career	Revenue Department of EIC (Diwan to Digby & Woodforde)
1814 Organization	Atmiya Sabha (Society of Friends)
1828 Evolution	Brahmo Sabha (Later renamed Brahmo Samaj)
1829 Milestone	Anti-Sati Regulation XVII passed by William Bentinck
Notable Journals	Sambad Kaumudi (Bengali), Mirat-ul-Akbar (Persian)
Title Conferred By	Mughal Emperor Akbar Shah II
Place of Demise	Bristol, England (27, September 1833), ['Raja Rammohan Way']

EXPECTED QUESTION FOR UPSC CSE

Descriptive Question

Q. "Raja Rammohan Roy was not merely a socio-religious reformer, but the architect who laid the intellectual foundations of modern Indian nationalism." Evaluate this statement with suitable examples from his socio-political crusades. (15 Marks, 250 Words)

MISCELLANEOUS

Padma Awards – India's Civilian Honours System

Why in News: The President of India will confer 66 Padma Awards, including 2 Padma Vibhushan, 6 Padma Bhushan and 58 Padma Shri, during the Civil Investiture Ceremony at Rashtrapati Bhavan.

Key Details

- The Padma Awards are among the highest civilian honours of India and are announced annually on the eve of Republic Day. They recognize exceptional achievements and distinguished service with an element of public service.
- The awards are classified into three categories: Padma Vibhushan, Padma Bhushan and Padma Shri. They honour contributions across diverse fields without distinction of profession, gender or status.

Evolution of Padma Awards

- The Padma Awards were instituted in 1954 along with the Bharat Ratna. Initially, the Padma Vibhushan had three classes, which were renamed in 1955 into the present structure.
- These awards have been conferred annually, except during brief suspensions. They reflect India's commitment to recognizing excellence and national service.

Categories of Padma Awards

- **Padma Vibhushan:** Awarded for exceptional and distinguished service. It is the second-highest civilian honour after Bharat Ratna.
- **Padma Bhushan:** Conferred for distinguished service of a high order. It recognizes notable contributions with national significance.
- **Padma Shri:** Awarded for distinguished service in any field. It honours outstanding achievements at various levels of society.

Selection Process

- The nomination process is open to all citizens, and self-nominations are also permitted. This promotes inclusivity and people's participation in identifying deserving individuals.
- The Padma Awards Committee, constituted by the Prime Minister, scrutinizes all nominations. Its recommendations are finally approved by the Prime Minister and the President.

Eligibility and Features

- All individuals are eligible irrespective of race, occupation, position or gender. However, government servants are generally excluded, except doctors and scientists.
- The total number of awards in a year cannot exceed 120. This cap excludes posthumous awards and awards to NRIs, foreigners and OCIs.
- A higher category of Padma Award can normally be granted only after five years. The government may relax this rule in exceptional cases.

Constitutional Status (Article 18)

- Under **Article 18 of the Constitution**, Padma Awards do not constitute titles. Recipients cannot use these honours as prefixes or suffixes to their names.
- Any misuse of the award for commercial or public purposes can lead to forfeiture. This preserves the dignity and constitutional spirit of civilian honours.

Article 18 and Civilian Awards

- ✓ **Article 18** abolishes titles and prohibits the State from conferring titles except military and academic distinctions.
- ✓ In **Balaji Raghavan v. Union of India (1996)**, the Supreme Court upheld the constitutional validity of Bharat Ratna and Padma Awards.
- ✓ The Court ruled that these awards are not "titles" under Article 18 as long as they are not used as prefixes or suffixes.

Fields Covered

- Padma Awards are conferred in areas such as Art, Literature, Science, Medicine, Sports, Social Work and Public Affairs. They recognize contributions that have positively impacted society and the nation.
- The awards encourage excellence and inspire public service. They also promote the values of inclusivity and national integration.

Conclusion

The Padma Awards represent India's highest recognition for distinguished service and excellence. Their transparent selection process, constitutional validity and broad inclusiveness make them an important instrument for honouring national achievements.

Note:

- These Awards are conferred by the President of India at ceremonial functions which are held at Rashtrapati Bhawan usually around March / April every year.
- For the year 2026, the President has approved conferment of 131 Padma Awards including 2 duo

cases (in a duo case, the Award is counted as one) as per list below.

- The list comprises 5 Padma Vibhushan, 13 Padma Bhushan and 113 Padma Shri Awards. 19 of the awardees are women and the list also includes 6 persons from the category of Foreigners / NRI / PIO / OCI and 16 Posthumous awardees.

EXPECTED QUESTION FOR UPSC CSE

Prelims MCQ

Q. With reference to the Padma Awards, consider the following statements:

1. Padma Awards are announced annually on the eve of Republic Day.

2. Under Article 18 of the Constitution, Padma Awards are treated as titles and may be used as prefixes to names.
3. Government servants are generally not eligible for Padma Awards, except doctors and scientists.

How many of the above statements are incorrect?

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

Answer: (a)

Daily MCQs from The Hindu & Indian Express

(May 2026)

Daily MCQs Practice

Q1. Which of the following statements are correct in respect of factors contribute to the intensity of wildfire in the Nilgiris?

1. Accumulated biomass and invasive undergrowth
2. Steep terrain and poor accessibility High humidity levels

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

Q2. Consider the following statements:

Statement 1: International Labour Organization Convention No. 81 applies only to labour inspection in agriculture.

Statement 2: Convention No. 81 primarily deals with labour inspection in industry and commerce, with a separate convention addressing agriculture.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q3. Consider the following statements regarding Fundamental Rights and language-based restrictions in India:

1. Restrictions on the right to practice any profession under Article 19 can be imposed only through a law enacted by the legislature.
2. The right to livelihood has been interpreted as part of the Right to Life under Article 21.
3. States in India have absolute power to impose regional language requirements for all professions without satisfying the test of reasonableness.

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

Q4. With reference to tiger conservation and carrying capacity in India, consider the following statements:

1. The ecological carrying capacity for tigers in a forest is primarily determined by the availability of prey base and habitat quality.
2. An increase in tiger population beyond carrying capacity may lead to higher human-wildlife conflict due to dispersal into human-dominated landscapes.

3. Translocation of tigers is considered a permanent and universally viable solution to address surplus tiger populations in India.
4. Habitat fragmentation due to infrastructure development can restrict natural dispersal corridors, intensifying territorial conflicts among tigers.

Which of the statements given above are correct?

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

Q5. Which of the following statements are *not* correct in respect of Confidence Motion:

1. It is moved to test whether the Council of Ministers enjoys the confidence of the Lok Sabha.
2. It can be introduced only by the Prime Minister.
3. If the motion is passed, the government must resign.

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

Q6. Consider the following statements:

Statement 1: The Right to Information Act, 2005 empowers citizens to access information from public authorities.

Statement 2: It promotes transparency and accountability in the functioning of government.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q7. With reference to international relations and nuclear geopolitics, consider the following statements:

1. Pakistan acted as a conduit for secret diplomatic engagement between the United States and China during the Cold War.
2. The 1953 Iranian Coup d'état led to the establishment of a democratic regime aligned with Western interests in Iran.
3. The nuclear proliferation activities associated with A. Q. Khan extended to countries such as Iran and North Korea.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) All three

(d) None

Q8. With reference to Early Childhood Care and Development (ECCD) in India, consider the following statements:

1. The POSHAN Abhiyaan primarily focuses only on food supplementation and excludes behavioural change communication.
2. The National Education Policy 2020 recognizes Early Childhood Care and Education as part of the foundational stage of schooling.
3. The Integrated Child Development Services (ICDS) provides a convergent platform for nutrition, health, and early childhood education services.
4. Anganwadi Centres under ICDS are designed exclusively for children above 6 years of age.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Q9. With reference to traffic regulation and enforcement mechanisms in India, consider the following statements:

1. Under the Motor Vehicles Act, an appeal against an award by a Motor Accident Claims Tribunal (MACT) can only be entertained if the appellant deposits a specified percentage of the awarded amount.
2. The Central Motor Vehicles Rules, 1989 provide the legal basis for procedural reforms in traffic enforcement, including digital e-challan systems.
3. Non-payment of traffic challans can lead to the "blacklisting" of a vehicle on the VAHAN portal, restricting access to services like fitness certification and RC renewal.

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

Q10. Consider the following statements regarding helicopter-launched anti-ship missile systems in India:

1. The Naval Anti-Ship Missile Short Range (NASM-SR) is an indigenously developed missile by the Defence Research and Development Organisation (DRDO).
2. The NASM-SR has a significantly higher payload and longer operational range compared to the Sea Eagle missile.
3. The missile features "Imaging Infra-Red (IIR)" seeker technology which allows for high-precision strikes even in contested electronic environments.
4. The system is designed for a "waterline hit," targeting the structural transition zone of a ship to maximize the probability of sinking.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three

(d) None

Q11. Consider the following statements:

Statement I: WHO primarily plays an advisory and coordinating role in global health and does not enforce binding international health laws on member states.

Statement II: WHO can impose penalties on countries for violating its guidelines.

Statement III: WHO operates independently of the United Nations system.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q12. Consider the following with reference to Diabetes Mellitus:

1. It is caused only by bacterial infection.
2. It leads to abnormally low blood sugar levels always.
3. It affects only elderly people.

How many of the above is/are correct?

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

Q13. With reference to changing trends in India's political system, consider the following statements:

1. A dominant-party system at the national level may reduce the effective functioning of opposition parties, thereby impacting deliberative democracy.
2. The Constitution of India explicitly provides for a multi-party system to ensure political pluralism.
3. Political identities in India, such as those based on religion or caste, can be reshaped through sustained political mobilisation and narrative-building.

Which of the statements given above is/are correct?

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

Q14. With reference to fiscal health and macroeconomic indicators of Indian States, consider the following statements:

1. Fiscal deficit represents the total borrowing requirement of a government to bridge the gap between its total expenditure and total receipts excluding borrowings.
2. A revenue deficit implies that the government is borrowing not only for capital expenditure but also to meet its routine administrative expenses.

3. A higher Labour Force Participation Rate (LFPR) necessarily indicates lower unemployment in an economy.
4. Persistent high interest payments as a share of revenue receipts can constrain a state's ability to undertake developmental expenditure.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Q15. Which of the following statements are correct in respect India–Bangladesh water sharing issues:

1. The Teesta River water-sharing agreement has been fully implemented.
2. Water sharing remains a key bilateral issue between the two countries.
3. The Ganga Water Treaty was signed in 1996.

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

Q16. Consider the following statements:

Statement 1: In India, voters directly cast a separate vote for political parties in Lok Sabha elections.

Statement 2: India follows the first-past-the-post system for parliamentary elections.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q17. Which of the following statements are correct in respect of Comptroller and Auditor General of India (CAG)?

1. The CAG is appointed by the President of India.
2. The CAG can be removed only in the same manner as a judge of the Supreme Court.
3. The CAG submits audit reports to the Parliament through the Prime Minister.

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

Q18. Consider the following statements:

1. The India Meteorological Department is responsible for issuing monsoon forecasts.
2. The India Meteorological Department has no role in aviation weather services.

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

Q19. With reference to public financial management systems and audit mechanisms in India, consider the following statements:

1. The Integrated Financial Management System (IFMS) ensures real-time tracking of government expenditure but cannot eliminate risks arising from human-level manipulation within the system.
2. The Comptroller and Auditor General of India conduct performance and compliance audits but does not have the authority to enforce criminal prosecution.
3. Drawing and Disbursing Officers (DDOs) are solely responsible for auditing treasury transactions before payments are made through government financial systems.

Which of the statements given above is/are correct?

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

Q20. With reference to electricity sector reforms and smart metering in India, consider the following statements:

1. Under the Electricity Act, 2003, consumers have the right to choose between prepaid and postpaid modes of electricity billing.
2. The Central Electricity Authority mandates compulsory adoption of prepaid smart meters for all electricity consumers in India.
3. State Electricity Regulatory Commissions have the authority to impose penalties on power utilities for non-compliance with service standards.

How many of the statements given above are correct?

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

Q21. Consider the following with reference to Public Interest Litigations (PILs) and writ petitions:

1. A Public Interest Litigation can be filed by any public-spirited citizen for the protection of public interest.
2. Writ petitions for enforcement of Fundamental Rights can be filed directly in the Supreme Court of India under Article 32.
3. Public Interest Litigations can be filed only by persons whose own Fundamental Rights are violated.

How many of the above is/are correct?

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

Q22. Which of the following statements regarding National Sample Survey Organisation (NSSO) is correct?

- (a) It conducts only agricultural surveys
- (b) It is responsible for judicial statistics only
- (c) It is one of India's principal agencies for statistical data collection
- (d) It works under the Election Commission of India

Q23. With reference to crime statistics, policing and criminal justice administration in India, consider the following statements:

1. The National Crime Records Bureau functions under the Ministry of Home Affairs and publishes the annual "Crime in India" report.
2. "Crime rate" in NCRB reports is generally expressed as the number of crimes registered per one lakh population.
3. Undertrials constitute less than half of India's prison population according to recent prison statistics trends.

How many of the statements given above are correct?

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

Q24. Consider the following pairs:

Country	Recent Strategic/Geopolitical Development
1. Vietnam:	Joined India's Indo-Pacific Oceans Initiative (IPOI)
2. Philippines :	Initiated arbitration against China over the South China Sea dispute under UNCLOS
3. Indonesia :	Faces maritime tensions with China near the Natuna Islands
4. Malaysia :	Member country of the Quad grouping

Which of the above pairs are correctly matched?

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

Q25. Consider the following statements:

Statement 1: The Chief Justice of India acts as the "Master of the Roster" in the Supreme Court.

Statement 2: The Chief Justice of India has the authority to allocate cases among different benches of the Supreme Court.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q26. Consider the following with reference to laws made by Parliament:

1. A law passed by Parliament applies uniformly to all States without exception.
2. The Parliament can make laws for Union Territories on any subject.
3. A State law inconsistent with a Parliamentary law on a Concurrent List subject may become void to the extent of inconsistency.

How many of the above is/are not correct?

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

Q27. With reference to the transition towards Electric Vehicles (EVs) in India, consider the following statements:

1. A rapid shift from Internal Combustion Engine (ICE) vehicles to EVs may increase India's dependence on imports of rare earth elements and battery components.
2. The environmental benefits of EVs depend partly upon the source of electricity generation in the country.
3. Heavy Rare Earth (HRE) magnets used in EV motors are largely sourced from countries other than China.

Which of the statements given above is/are correct?

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

Q28. With reference to India's evolving security strategy towards Pakistan after Operation Sindoor, consider the following statements:

1. Operation Sindoor was projected as a calibrated response below the threshold of full-scale war.
2. Pakistan's long-term strategic reliance on proxy warfare emerged partly from its military experiences after the 1971 war.
3. India's doctrine of "massive retaliation" is linked to its broader nuclear deterrence posture.
4. Military coercion alone is considered sufficient for achieving durable peace between India and Pakistan.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Q29. With reference to the global nuclear non-proliferation framework, consider the following statements:

1. The Nuclear Non-Proliferation Treaty (NPT) recognises the right of member states to develop nuclear energy for peaceful purposes under international safeguards.
2. North Korea officially withdrew from the NPT before conducting its first nuclear test.

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

Q30. With reference to the Revolt of 1857 and its portrayal in British public discourse, consider the following statements:

1. British newspapers initially underestimated the scale and causes of the revolt.
2. Victorian theatre often portrayed Indian rebels as central heroes resisting colonial oppression.
3. British explanations of the revolt frequently ignored economic exploitation and social grievances in India.
4. The Revolt of 1857 led to the end of the East India Company's rule in India.

Which of the statements given above are correct?

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

Q31. Which of the following statements are correct in respect of government formation in a State?

1. The Governor appoints the Chief Minister.
2. The Chief Minister must enjoy majority support in the Legislative Assembly.
3. The President appoints the Chief Minister directly.

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

Q32. Consider the following statements:

Statement 1: PM-KISAN provides income support directly to eligible farmer families.

Statement 2: The scheme is fully funded by the State Government.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q33. Consider the following with reference to KIND-X:

1. The KIND-X exercise is conducted between India and South Korea.
2. It focuses on strengthening maritime cooperation and naval interoperability.
3. The exercise is conducted under the framework of the United Nations peacekeeping operations.

How many of the above is/are correct?

- (a) Only one
- (b) Only two
- (c) All three

- (d) None

Q34. Which one of the following is a discretionary power of the Governor?

- (a) Appointing Chief Minister
- (b) Granting assent to Bills
- (c) Reserving certain Bills for the President
- (d) Addressing the State Legislature

Q35. With reference to hate speech and criminal liability in India, consider the following statements:

1. Speech can amount to hate speech even if a particular community is not explicitly named in the statement.
2. Sections 153A and 295A of the IPC deal with acts promoting enmity and deliberate insults to religious beliefs.
3. Prior sanction of the government is always necessary before registration of an FIR in hate speech cases.

Which of the statements given above is/are correct?

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

Q36. With reference to the Indus Waters Treaty (IWT), consider the following statements:

1. The treaty gives India unrestricted rights over the waters of the Ravi, Beas and Sutlej rivers.
2. The World Bank is a signatory and facilitator of the treaty framework.
3. Under the treaty, India is completely barred from using the waters of the Indus, Jhelum and Chenab rivers for hydropower generation.
4. Pakistan has recently attempted to raise the issue of the treaty at international forums such as the UN Security Council.

Which of the statements given above are correct?

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

Q37. Which of the following statements are correct in respect of transactions are included in the Current Account of the Balance of Payments?

1. Export and import of goods
2. Remittances from Indians living abroad
3. Interest payments on external loans

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

Q38. Consider the following statements:

Statement 1: The Central Bureau of Investigation (CBI) derives its powers from the Delhi Special Police Establishment Act, 1946.

Statement 2: The CBI can investigate crimes in a state without the consent of the concerned state government.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q39. With reference to India's external sector and Balance of Payments (BoP), consider the following statements:

- 1. A persistent Current Account Deficit necessarily leads to depletion of foreign exchange reserves.
- 2. Foreign Direct Investment and Foreign Portfolio Investment are part of the capital account flows.
- 3. A sharp reduction in imports can improve the current account balance, but it may also slow economic growth in the short term.

Which of the statements given above is/are correct?

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

Q40. Consider the following statements:

- 1. Western Disturbances generally originate over the Mediterranean region and bring winter rainfall to northwestern India.
- 2. During El Niño years, India usually receives stronger southwest monsoon rainfall than normal.
- 3. Wet Bulb Temperature reflects the combined effect of heat and humidity on the human body.
- 4. "Feels like temperature" depends only on the recorded air temperature and is unaffected by humidity or wind conditions.

Which of the statements given above are correct?

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

Q41. Which of the following statements are correct in respect of the Chairman of Rajya Sabha?

- 1. The Vice-President of India acts as the ex-officio Chairman of the Rajya Sabha.
- 2. The Chairman of Rajya Sabha can vote in the first instance during voting in the House.
- 3. The Chairman is not a member of the Rajya Sabha

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

Q42. Consider the following statements:

Statement 1: The Pro-tem Speaker is appointed by the President to administer oath to newly elected members of the Lok Sabha.

Statement 2: The Pro-tem Speaker presides over the House until the election of the regular Speaker.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q43. The Gross Enrolment Ratio (GER) in education is calculated as:

- (a) Number of teachers divided by total population
- (b) Total enrolment in a level of education divided by population of the official age group for that level
- (c) Number of schools divided by student population
- (d) Literacy rate divided by school-age population

Q44. With reference to wildlife corridors around Kaziranga National Park, consider the following statements:

- 1. Wildlife corridors help animals move between habitats, especially during floods and seasonal migration.
- 2. The Supreme Court in 2019 prohibited new construction activities in identified animal corridors around Kaziranga.
- 3. National Highway-37 has contributed to fragmentation of the Kaziranga-Karbi Anglong landscape.

How many of the above statements are correct?

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

Q45. Consider the following statements:

Statement 1: The Anti-Defection Law was added to the Constitution through the 52nd Constitutional Amendment Act, 1985.

Statement 2: The law aims to prevent political defections by legislators for personal or political gains.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q46. Consider the following with reference to geography of the Strait of Hormuz:

- 1. The Strait of Hormuz separates Iran from the Musandam Peninsula of Oman.
- 2. The strait is among the narrowest and busiest maritime trade routes in the world.
- 3. The strait connects the Red Sea with the Mediterranean Sea

How many of the above is/are correct?

- (a) Only one
- (b) Only two

- (c) All three
- (d) None

Q47. Which of the following best explains why invasive alien plant species are considered a serious ecological threat in protected forest ecosystems?

- (a) They increase the mineral content of forest soil and accelerate natural succession.
- (b) They replace native vegetation, alter habitat structure and reduce biodiversity over time.
- (c) They improve groundwater recharge and strengthen the food chain for all wildlife species.
- (d) They prevent forest fires by maintaining higher soil moisture throughout the year.

Q48. With reference to India's engagement with the Nordic countries, consider the following statements:

1. The European Free Trade Association (EFTA)-India Trade and Economic Partnership Agreement include a long-term investment commitment towards India.
2. Norway was among the first countries to recognise independent India after 1947.
3. India's Arctic engagement is linked only to commercial shipping interests in the polar region.
4. Cooperation between India and Nordic countries is increasingly focused on green technology and sustainable maritime sectors.

Which of the statements given above are correct?

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

Q49. Which of the following statements are correct in respect of Inner Line Permit (ILP):

1. The ILP system aims to protect the indigenous culture and interests of tribal communities.
2. States such as Arunachal Pradesh, Nagaland, and Mizoram currently implement the ILP system.
3. The ILP is issued only by the Central Government.

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

Q50. Which of the following is not a function of the RBI?

- (a) Issuing currency notes
- (b) Banker to Government
- (c) Conducting population census
- (d) Monetary policy formulation

Q51. With reference to reproductive rights and the Medical Termination of Pregnancy (MTP) framework in India, consider the following statements:

1. The 2021 amendment to the MTP law extended the upper gestation limit for certain categories of women from 20 weeks to 24 weeks.
2. Under the present legal framework, termination of pregnancy beyond 24 weeks is permitted only in cases involving substantial foetal abnormalities.

3. The Supreme Court has recognised reproductive autonomy as part of personal liberty under the Constitution.
4. The MTP framework in India now explicitly covers unmarried women in cases of contraceptive failure.

Which of the statements given above are correct?

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

Q52. Consider the following statements regarding Polyendocrine Metabolic Ovarian Syndrome (PMOS):

1. PMOS is the new term proposed to reflect the multisystem nature of the condition earlier known as PCOS.
2. The condition is associated only with reproductive complications and has no link with metabolic disorders.
3. Women affected by PMOS may face increased risks of Type 2 diabetes, hypertension and cardiovascular diseases.

Which of the statements given above are correct?

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

Q53. Which of the following statements are correct in respect of tariffs behaving like economic sanctions?

1. High tariffs can restrict imports from targeted countries and reduce their export earnings.
2. Tariffs may disrupt global supply chains and increase production costs for industries dependent on imported inputs.
3. Tariffs always lead to a reduction in domestic prices of goods in the importing country.

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

Q54. Consider the following statements:

Statement I: A country may record negative Real GDP growth during an economic recession.

Statement II: Real GDP measures output after adjusting for inflation.

Statement III: Recession always means continuous rise in the general price level.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q55. With reference to India's Advanced Medium Combat Aircraft (AMCA) programme, consider the following statements:

1. It is India's indigenous fifth-generation stealth fighter aircraft programme.
2. The Aeronautical Development Agency (ADA) functions under the Defence Research and Development Organisation (DRDO).
3. AMCA is intended to strengthen India's capability in advanced aerospace and network-centric warfare.

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

Q56. With reference to zoonotic diseases and emerging global health risks, consider the following statements:

1. Habitat fragmentation and deforestation can increase the probability of zoonotic spillovers by bringing humans into closer contact with wildlife reservoirs.
2. The "One Health" approach recognises the interconnection between human health, animal health and environmental health.
3. Vector-borne diseases such as dengue and malaria are completely unaffected by climate change because vectors adapt only to genetic changes.
4. The International Health Regulations (IHR) are legally binding regulations under the World Health Organization aimed at strengthening global public health security.

Which of the statements given above are correct?

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

Q57. With reference to energy storage systems used for renewable energy integration, consider the following statements:

1. Pumped Hydro Storage (PHS) stores energy by pumping water to a higher reservoir during periods of surplus electricity generation.
2. Flywheel Energy Storage Systems are mainly useful for providing quick grid stability and managing short-term fluctuations.
3. Battery Energy Storage Systems (BESS) in India are presently based mainly on imported lithium-ion cells.

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

Q58. Consider the following statements regarding the Forest Rights Act (FRA), 2006 and tribal consent in forest diversion matters:

1. The Act recognises both individual and community forest rights of Scheduled Tribes and other traditional forest dwellers.
2. Settlement of forest rights is required before diversion of forest land for non-forest purposes.
3. Gram Sabha consent for forest diversion can be legally replaced by approval from any government agency or district authority.
4. Particularly Vulnerable Tribal Groups (PVTGs) such as the Shompen are entitled to habitat rights under the FRA framework.

Which of the statements given above are correct?

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

Q59. Which of the following statements are correct in respect of Cabinet Ministers in India?

1. Cabinet Ministers are the senior-most members of the Council of Ministers.
2. They participate in the formulation of major government policies.
3. All Cabinet Ministers are appointed directly by the President without the advice of the Prime Minister.

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

Q60. Consider the following statements:

Statement 1: A higher share of services in total exports indicates that a country is increasingly dependent on knowledge-based sectors such as IT, finance, and business services.

Statement 2: Services exports generally require lower levels of skilled manpower compared to merchandise exports.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q61. Consider the following statements:

Statement 1: The India Meteorological Department (IMD) functions under the Ministry of Agriculture and Farmers Welfare.

Statement 2: The IMD is responsible for weather forecasting, cyclone warnings, and seismological observations in India.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q62. With reference to the recent Ebola outbreak in Central Africa, consider the following statements:

1. The recent outbreak has been linked to the Bundibugyo strain of the Ebola virus.
2. Unlike the Ebola-Zaire strain, there are currently no approved vaccines or specific therapeutics for the Bundibugyo strain.
3. The World Health Organization declared the outbreak a full pandemic emergency under its highest global alert mechanism.

How many of the above statements is/are not correct?

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

Q63. Consider the following statements:

Statement 1: A higher share of services in total exports indicates that a country is increasingly dependent on knowledge-based sectors such as IT, finance, and business services.

Statement 2: Services exports generally require lower levels of skilled manpower compared to merchandise exports.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q64. Consider the following with reference to Norway:

1. Norway is one of the world's major exporters of oil and natural gas.
2. The Nobel Peace Prize is awarded in Norway.
3. The country lies entirely south of the Arctic Circle.

How many of the above is/are correct?

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

Q65. Consider the following statements:

Statement 1: Expansion of BRICS has increased the representation of oil-producing and developing countries within the grouping.

Statement 2: BRICS expansion automatically grants permanent membership in the United Nations Security Council to all new entrants.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1

- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q66. Consider the following statements:

Statement I: The depreciation of the Indian Rupee can increase inflationary pressures in the economy.

Statement II: A weaker rupee makes imports such as crude oil more expensive.

Statement III: Rupee depreciation increases the purchasing power of Indians abroad.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q67. Which of the following statements are correct regarding India-Vietnam defence cooperation?

1. India and Vietnam signed a Joint Vision Statement on Defence Partnership Towards 2030 during Defence Minister Rajnath Singh's visit to Hanoi in 2022.
2. India has gifted an indigenously built missile corvette to Vietnam as part of defence cooperation.

Select the answer using the code given below:

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

Q68. Consider the following statements regarding Urban Local Bodies (ULBs) in India:

1. In India, nearly two-thirds of government employees work under local governments.
2. Urban Local Bodies in India generate a very small share of GDP through their own taxes.
3. Weak financial autonomy of ULBs increases their dependence on state governments.
4. The 73rd and 74th Constitutional Amendments granted constitutional status to local governments.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Q69. Consider the following statements:

Statement 1: The Unlawful Activities (Prevention) Act (UAPA) empowers the Government of India to designate individuals as terrorists.

Statement 2: The 2019 amendment to UAPA enabled individuals, and not only organisations, to be declared terrorists.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q70. Consider the following statements:

Statement I: The National Investigation Agency (NIA) is the central counter-terrorism investigation agency of India.

Statement II: The NIA was established after the 2008 Mumbai terror attacks.

Statement III: The NIA functions under the Ministry of Home Affairs.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q71. Consider the following statements:

Statement I: Cuttack's Rupa Tarakasi craft received a Geographical Indication (GI) tag in 2024.

Statement II: Rupa Tarakasi involves transforming silver into fine wires and intricate decorative designs.

Statement III: The craft tradition of Tarakasi originated exclusively during British rule in India.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q72. Consider the following statements regarding the gold loan market in India:

1. Five southern states account for nearly three-fourths of India's total gold loan outstanding.
2. Tamil Nadu has the highest gold loan outstanding among all states.
3. Uttar Pradesh accounts for a higher gold loan outstanding than Gujarat.
4. Gold loans emerged as the fastest-growing segment in the lending market in FY26.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Q73. Consider the following statements:

Statement 1: The RTI Act empowers citizens to seek information from public authorities.

Statement 2: The RTI Act was enacted to promote transparency and accountability in governance.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q74. Consider the following statements:

Statement I: The Central Information Commission is the highest appellate body under the Right to Information Act, 2005.

Statement II: The CIC hears complaints and second appeals related to public authorities under the Central Government.

Statement III: The Chief Information Commissioner and Information Commissioners are appointed by the President of India.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q75. Which of the following statements are correct regarding Muga silk tradition in India?

1. Muga silk is geographically associated with Assam.
2. It is popularly known as the "golden silk" of India.
3. The silk is traditionally produced without artificial dyes.
4. Muga silk has been granted a Geographical Indication (GI) tag.

Select the answer using the code given below:

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

Q76. With reference to reusable rocket technology and satellite-based internet systems, consider the following statements:

1. Reusable rockets help reduce the cost of access to space by enabling multiple launches using the same launch vehicle components.
2. Satellite internet constellations such as Starlink primarily operate through geostationary satellites placed at very high altitudes.
3. Lower launch costs can accelerate expansion of space-based communication infrastructure.

How many of the above statements are correct?

- (a) Only one
- (b) Only two

- (c) All three
- (d) None

Q77. Consider the following statements:

Statement I: The G-7 Summit serves as a platform for major advanced economies to discuss global economic and geopolitical issues.

Statement II: The member countries of the G-7 include the United States, United Kingdom, Japan, Germany, France, Italy, and India.

Statement III: The G-7 has 7 permanent secretariat and the presidency rotates semi-annually among member countries.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q78. Which of the following correctly distinguishes the International Court of Justice from the International Criminal Court?

- (a) ICJ deals with disputes between states, while ICC prosecutes individuals for international crimes
- (b) ICJ prosecutes war criminals, while ICC settles maritime disputes
- (c) Both are organs of the United Nations
- (d) Both deals only with criminal matters

Q79. With reference to the concept of Floor Area Ratio (FAR) and urban infrastructure planning, consider the following statements:

1. Floor Area Ratio (FAR) refers to the ratio between the total built-up area of all floors and the total plot area.
2. Higher FAR generally permits greater vertical construction and urban densification.

Select the answer using the code given below:

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

Q80. Consider the following statements:

Statement I: Ageing power transformers can contribute to electricity outages during periods of peak demand.

Statement II: Power transformers have a defined operational life after which efficiency and reliability may decline.

Statement III: Increasing electricity demand automatically eliminates the need for infrastructure upgrades.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I

- (c) Only one of the Statements II and III is correct and that explains Statement I

- (d) Neither Statement II nor Statement III is correct

Q81. Which of the following statements are correct in respect of impact of increasing imports on an economy?

1. Rising imports can widen the trade deficit if exports do not increase proportionately.
2. Higher imports of capital goods and technology can improve domestic productivity and industrial growth.
3. Increasing imports always strengthen domestic manufacturing competitiveness in the short term.

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

Q82. Consider the following statements:

Statement I: The French Open is played on clay courts, making it unique among the four Grand Slam tournaments.

Statement II: Clay courts generally speed up the ball and produce a higher bounce compared to grass courts.

Statement III: Players with strong endurance and baseline rallies cannot perform well on clay surfaces.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q83. With reference to the Uniform Civil Code (UCC) and Scheduled Tribes in India, consider the following statements:

1. Certain states have provided exemptions or special protections for tribal communities from the ambit of the UCC.
2. Tribal customary practices in several regions are protected under constitutional provisions such as the Fifth and Sixth Schedules.
3. The Constitution of India explicitly mandates that tribal customary laws must be abolished after the implementation of the UCC.

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

Q84. With reference to the fertiliser subsidy regime in India, consider the following statements:

1. India imports a significant share of its urea requirements from abroad.
2. Heavy subsidisation of urea may encourage diversion and smuggling of fertilisers.

3. Bringing urea under the Nutrient-Based Subsidy (NBS) scheme has been suggested as a reform measure.
4. Under the existing system, urea is sold entirely at market-determined prices to farmers.

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Q85. Which of the following statements are correct in respect of Quadrilateral Security Dialogue (QUAD)?

1. The first in-person QUAD Leaders' Summit was hosted by the United States.
2. QUAD countries cooperate on vaccine distribution and resilient supply chains.
3. QUAD operates under the framework of the United Nations Security Council.

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

Q86. Consider the following statements:

Statement 1: The Padma Awards are announced annually on the occasion of Republic Day.

Statement 2: The Padma Vibhushan is awarded for distinguished service of the highest order in any field.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q87. Which one of the following sectors contributes the highest share to India's GDP?

- (a) Agriculture
- (b) Manufacturing
- (c) Mining
- (d) Services

Q88. Consider the following statements:

Statement I: Rising crude oil prices can increase pressure on India's external sector.

Statement II: India imports a significant portion of its crude oil requirement from abroad.

Statement III: Higher crude oil prices may increase the import bill and demand for foreign exchange.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I

- (d) Neither Statement II nor Statement III is correct

Q89. Which of the following statements are correct in respect of Anti-Defection Law in India?

1. It was added to the Constitution through the 52nd Constitutional Amendment Act, 1985.
2. The Tenth Schedule deals with provisions related to disqualification on grounds of defection.
3. The decision regarding disqualification of members is made by the Election Commission of 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

Q90. Consider the following statements:

Statement 1: The National Testing Agency also conducts the CUET examination for admission to many central universities in India.

Statement 2: The main objective of the National Testing Agency is to improve transparency and efficiency in entrance examinations.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q91. With reference to the India-US Critical Minerals Framework, consider the following statements:

1. The framework seeks cooperation across mining, processing, recycling and investment related to critical minerals.
2. The agreement aims to reduce dependence on single-source supply chains for critical minerals.
3. Rare earth minerals are important for advanced technologies including electronics and defence manufacturing.
4. The framework has been signed under the Shanghai Cooperation Organisation (SCO).

How many of the above statements are correct?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Q92. Which of the following statements are correct regarding the International Relations and Peace Studies (IRPS) programme at Nalanda University?

1. The programme explores Indian epics and Indic knowledge systems in the context of contemporary international relations.
2. The programme exclusively focuses on religious studies and theology.

3. The programme examines themes such as diplomacy, governance and strategic studies through ancient Indian texts.

Select the answer using the code given below:

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

Q93. Consider the following statements:

Statement 1: CBAM is a mechanism introduced by the European Union to impose carbon-based charges on certain imported goods.

Statement 2: CBAM aims to prevent carbon leakage by ensuring imported products face carbon costs similar to EU-produced goods.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q94. Consider the following statements:

Statement I: A party whip is issued to ensure discipline among party members during voting in the Lok Sabha.

Statement II: Members can face disqualification under the Anti-Defection Law for violating a party whip in certain cases.

Statement III: The whip system helps political parties maintain unity and coordinated decision-making in Parliament.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q95. With reference to heatwave conditions and associated weather phenomena in India, consider the following statements:

- 1. Western Disturbances generally originate in the Mediterranean region and influence weather over northwest India.
- 2. Strong northwesterly dry winds can aggravate heat stress and increase dust suspension in the atmosphere.
- 3. The India Meteorological Department (IMD) declares a heatwave in plains only when the maximum temperature exceeds 50°C.

How many of the above statements are correct?

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

Q96. With reference to the Schengen visa system and outsourcing of visa processing services, consider the following statements:

- 1. Schengen member states may outsource administrative visa application services to private agencies while retaining decision-making authority over visa issuance.
- 2. The Schengen visa permits unrestricted long-term employment rights across all European Union member states.

Select the answer using the code given below:

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

Q97. Which of the following statements are correct in respect of constitutional position of a Chief Minister after losing majority in the State Legislature?

- 1. The Governor is constitutionally bound to immediately dismiss the Chief Minister upon losing a floor test.
- 2. Resignation of a Chief Minister upon losing majority is a constitutional convention, not an explicit provision of Article 164.
- 3. Even if a Chief Minister refuses to resign, dissolution of the State Legislative Assembly upon completion of its term automatically ends the CM's tenure.

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

Q98. Consider the following statements:

Statement 1: Article 48 directs the State to organise agriculture and animal husbandry on modern and scientific lines.

Statement 2: It also directs the State to prohibit the slaughter of cows, calves and other milch and draught cattle.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q99. Which of the following statements regarding the "death zone" on Mount Everest are correct?

- 1. The death zone refers to regions above 8,000 metres altitude.
- 2. Oxygen availability in the death zone is significantly lower than at sea level.
- 3. Human beings can permanently survive in the death zone without supplemental oxygen.

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. Consider the following statements:

Statement I: El Niño is generally associated with warming of surface waters in the equatorial Pacific Ocean.

Statement II: El Niño years are often associated with below-normal southwest monsoon rainfall in India.

Statement III: El Niño always causes drought conditions in India.

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

- (a) Both Statement II and Statement III are correct and both of them explain Statement I
- (b) Both Statement II and Statement III are correct but only one of them explains Statement I
- (c) Only one of the Statements II and III is correct and that explains Statement I
- (d) Neither Statement II nor Statement III is correct

Q101. Consider the following statements:

Statement 1: The CBI derives its legal powers from the Delhi Special Police Establishment Act, 1946.

Statement 2: The CBI can investigate offences in a State without the consent of the concerned State Government.

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

- (a) Both statement 1 and Statement 2 are correct and statement 2 explains statement 1
- (b) Both statement 1 and Statement 2 are correct and statement 2 does not explain statement 1
- (c) Statement 1 is correct, but Statement 2 is incorrect
- (d) Statement 2 is correct, but Statement 1 is incorrect

Q102. Consider the following with reference to India–Myanmar border:

- 1. Among the Indian states sharing a border with Myanmar, only one does not share a border with China.

- 2. Manipur shares a longer border with Myanmar than Nagaland.
- 3. The Free Movement Regime (FMR) was introduced to facilitate movement of people living along the India–Myanmar border.

How many of the above is/are correct?

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

Q103. Which one of the following best explains the primary objective behind establishing Special NIA Courts?

- (a) To hear all criminal cases arising within a State
- (b) To provide speedy trial in cases investigated under special national security laws
- (c) To adjudicate disputes between States and the Union Government
- (d) To hear appeals against decisions of District Courts

Q104. With reference to the Long Period Average (LPA) rainfall used by the India Meteorological Department (IMD), consider the following statements:

- 1. LPA represents the average rainfall received over a specified reference period.
- 2. The current LPA for the Southwest Monsoon season is based on the period 1971–2020.
- 3. LPA is revised annually by the India Meteorological Department.

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

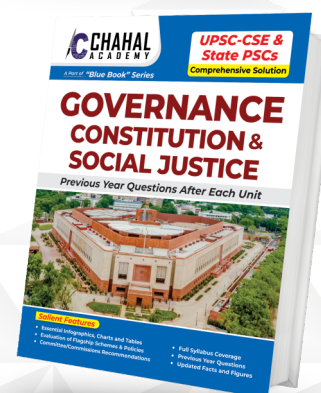
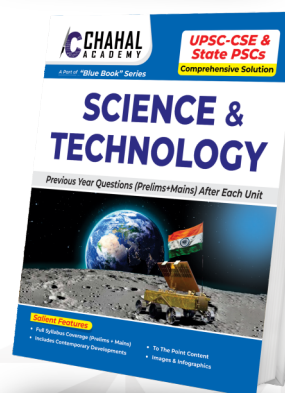
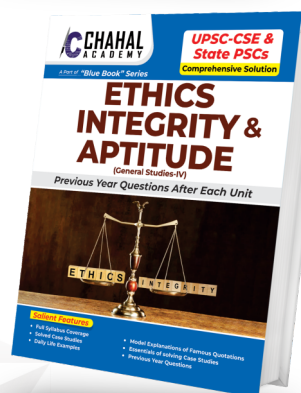
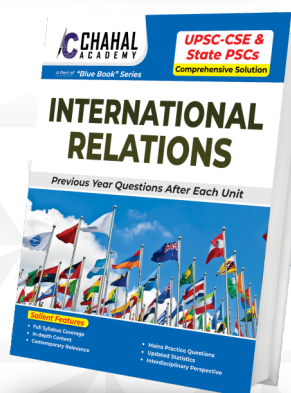
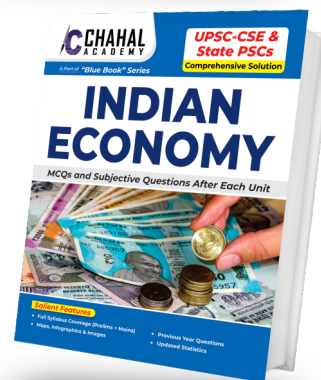
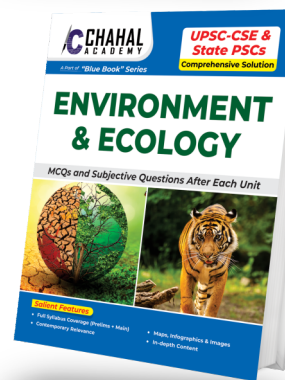
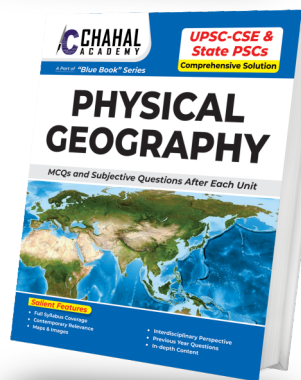
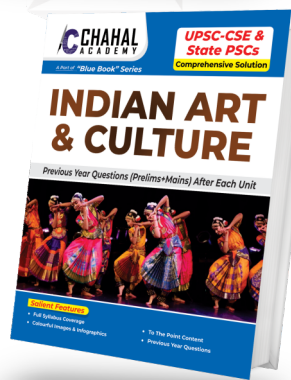
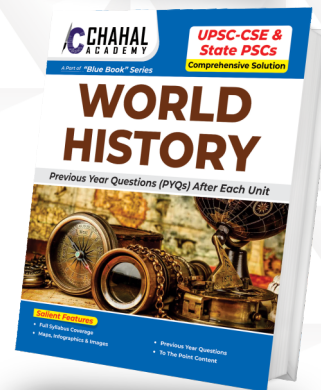
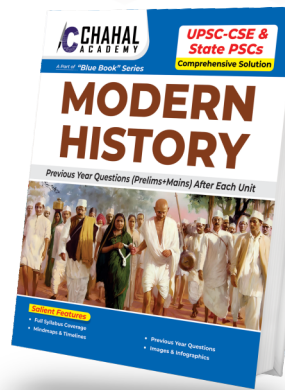
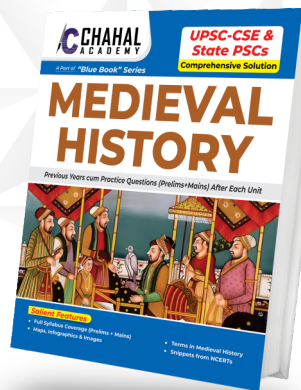
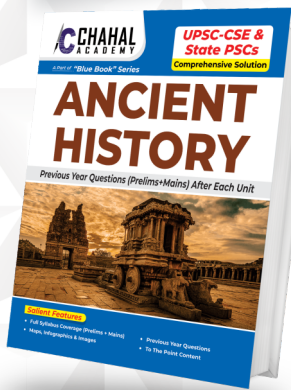
Answer Key: May 2026

Q1.	a	Q2.	d	Q3.	a	Q4.	a	Q5.	b
Q6.	a	Q7.	b (1 and 3 only)	Q8.	b (2 and 3 only)	Q9.	d	Q10.	c
Q11.	d	Q12.	d	Q13.	a	Q14.	c (1, 2 & 4 only)	Q15.	b
Q16.	d	Q17.	a	Q18.	a	Q19.	a	Q20.	b
Q21.	b (1 and 2 only)	Q22.	c	Q23.	b (1 & 2 only)	Q24.	b	Q25.	a
Q26.	a (1 only)	Q27.	a	Q28.	c (1, 2 & 3 only)	Q29.	c	Q30.	a
Q31.	a	Q32.	c	Q33.	b (1 and 2 only)	Q34.	c	Q35.	a
Q36.	a	Q37.	d	Q38.	c	Q39.	b	Q40.	a
Q41.	c	Q42.	a	Q43.	b	Q44.	c	Q45.	a
Q46.	b (1 and 2 only)	Q47.	b	Q48.	a	Q49.	a	Q50.	c
Q51.	a	Q52.	b	Q53.	a	Q54.	c	Q55.	c
Q56.	a	Q57.	d	Q58.	a	Q59.	a	Q60.	c
Q61.	d	Q62.	a (3 only)	Q63.	c	Q64.	b (1 and 2 only)	Q65.	c
Q66.	c	Q67.	c	Q68.	c (2, 3 and 4 only)	Q69.	a	Q70.	b
Q71.	c	Q72.	c	Q73.	a	Q74.	b	Q75.	c
Q76.	b (1 & 3 only)	Q77.	d	Q78.	a	Q79.	c	Q80.	c
Q81.	a	Q82.	d	Q83.	a	Q84.	c (1, 2 and 3 only)	Q85.	a
Q86.	b	Q87.	d	Q88.	a	Q89.	a	Q90.	a
Q91.	c (1, 2 & 3 only)	Q92.	a	Q93.	a	Q94.	a	Q95.	b (1 & 2 only)
Q96.	a	Q97.	b	Q98.	a	Q99.	a	Q100.	c
Q101.	c	Q102.	b (2 and 3 only)	Q103.	b	Q104.	a		

Blue Book Series

By Chahal Academy

Books in Our "Blue Book" Series



For any Query or Order-  9205927650

 **CHAHAL ACADEMY**
(Chahal Academy Pvt. Ltd.)

www.chahalacademy.com
Follow Us     

MRP. ₹ 120.00