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## Today's Prelims Topics

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### Motuo Hydropower Project

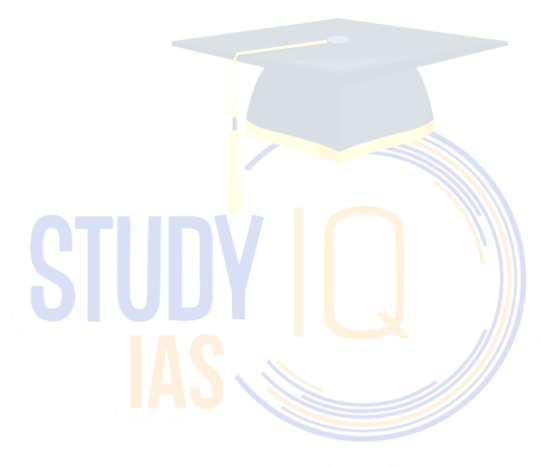
#### Context

Chinese authorities have begun constructing the Motuo hydropower project.

#### About the Project

- **River:** Yarlung Tsangpo river.
  - The Yarlung Tsangpo becomes the **Siang River** in Arunachal Pradesh and merges into the **Brahmaputra** in Assam.
- **Fact:** After completion it will overtake the Three Gorges dam as the **world's largest**.
- **Potential Impact on India:**
  - The dam gives China **hydrological control**, raising fears of **water diversion** (reducing flow into India) or **sudden water releases** (termed a "water bomb") during conflict or as coercive diplomacy.

Source: [BBC](#)



## BioEmu AI

### Context

A new deep learning model named **BioEmu** can accurately predict the complete range of shapes a protein adopts under natural biological conditions.

### BioEmu: A New Breakthrough in Protein Structure Prediction

- **What is BioEmu?**
  - **BioEmu** stands for **Biomolecular Emulator**, a **generative deep learning model** for proteins.
  - It predicts the **entire range of shapes** a protein can adopt under **biological conditions**.
  - Developed by **Microsoft**, **Rice University (USA)**, and **Freie Universität (Germany)**.
- **Key Features**
  - Generates **thousands of protein structure samples per hour** using just a **single GPU**.
  - Works from the **amino acid sequence** of a protein to sample from its **equilibrium distribution**.
  - Enables **high-resolution modeling of protein flexibility** at scale.
- **How it Works**
  - **Faster and cheaper** than traditional **molecular dynamics (MD)** simulations.
  - Captures **large structural changes**, **local unfolding**, and **cryptic pockets**—key to understanding drug docking sites (e.g., in **Ras protein**).
- **Accurately predicts:**
  - **83% of large shape shifts**
  - **70–81% of smaller conformational changes**, including both **open and closed** enzyme forms (like **adenylate kinase**).
- Can handle **disordered proteins** (those lacking a fixed 3D structure) and assess how **mutations affect stability**.
- Can generate **all stable shapes** of a protein in just **minutes to hours**.
- **Limitations**
  - Cannot model:
    - **Cell membranes**
    - **Drug molecules**
    - **Temperature or pH variations**
    - **Prediction reliability** like **AlphaFold**
  - Focused on **protein monomers**, not complex biological environments.

Source: [TheHindu](#)

## Meri Panchayat App

### Context

The mobile app “**Meri Panchayat**” has gained international acclaim by winning the **WSIS Prizes 2025 Champion Award**, a prestigious global recognition under the **World Summit on the Information Society (WSIS)** initiative.

### About Meri Panchayat App – WSIS Prizes 2025 Champion

- **Purpose:** A unified digital governance platform designed for rural India, catering to citizens, officials, and stakeholders of the Panchayati Raj system.
- **Functionality:** Integrates multiple government services and portals into one seamless web and mobile interface to enhance **transparency, accountability, and citizen participation**.
- **Launched By:** Joint initiative of the **Ministry of Panchayati Raj** and **National Informatics Centre (NIC)** under the **Ministry of Electronics and IT**.

### Key Features:

- Access to real-time data on **Panchayat budgets, receipts, payments, and development plans**.
- Information on **elected representatives, functionaries, and local civic services**.
- View **Gram Panchayat Development Plans (GDPs)** and track project proposals.
- Get **local weather forecasts** at the Gram Panchayat level.
- Tools for **social audits, fund utilization tracking, and grievance redressal** using **geo-tagging and geo-fencing**.
- **Multilingual support:** Offers access in over **12 Indian languages** for greater inclusivity.
- Empowers citizens to:
  - **Propose projects,**
  - **Rate completed works,**
  - **Access Gram Sabha agendas and resolutions**—boosting participatory democracy.



### About WSIS Prizes

- Recognizes global initiatives that leverage **ICTs** for **sustainable development**.
- Created under the **World Summit on the Information Society (WSIS)** to evaluate and reward impactful digital solutions worldwide.

Source: [PIB](#)

## National Education Society for Tribal Students (NESTS)

### Context

NESTS signed a 5-year MoU with Avanti Fellows to provide JEE/NEET coaching to tribal students in Eklavya schools starting 2025–26.

### About NESTS

- An **autonomous society** established in **2019** under the **Ministry of Tribal Affairs**, Government of India, to manage and oversee **Eklavya Model Residential Schools (EMRSs)**.
- Aims to deliver **quality upper primary to senior secondary education** to tribal children in remote areas through an integrated residential model.
- Oversees **722 sanctioned EMRSs**, of which **480 are functional**, catering to over **180,000 students**.
- **Objectives & Mission:**
  - **Empower tribal students** to access higher and professional education.
  - **Bridge socio-economic gaps** between tribal and non-tribal communities.
  - Provide **free, holistic residential education** (academics, sports, arts, life skills).
  - Ensure quality education **on par with Navodaya Vidyalayas**.
  - Establish **State-level Societies (SESTS)** for effective implementation and fund management.
- **Key Functions:**
  - **Sets standards** for EMRS curricula, infrastructure, and teacher recruitment.
  - **Oversees infrastructure**, digital learning, and skill development programs.
  - **Conducts training workshops** and capacity-building for staff.
  - **Recognizes achievements** of students and teachers to encourage excellence.



### About Eklavya Model Residential Schools (EMRS)

- **Flagship scheme** by Ministry of Tribal Affairs for ST students (Class 6–12).
- Started in **1998**, revamped in **2018–19** for wider reach and better quality.
- To be set up in tribal blocks (50% ST population & 20,000 ST persons).
- **Target: 728 schools** by 2026.
- Managed by **NESTS**, an autonomous body under the ministry.
- **CBSE curriculum, free education**, residential & co-ed schools.
- Includes local art, culture, sports & skill development training.
- Full infrastructure: classrooms, labs, hostels, staff quarters, playground.
- Capacity: **480 students** per school, 50:50 gender ratio.
- **10% seats** for non-ST students; **20% sports quota** for ST achievers.

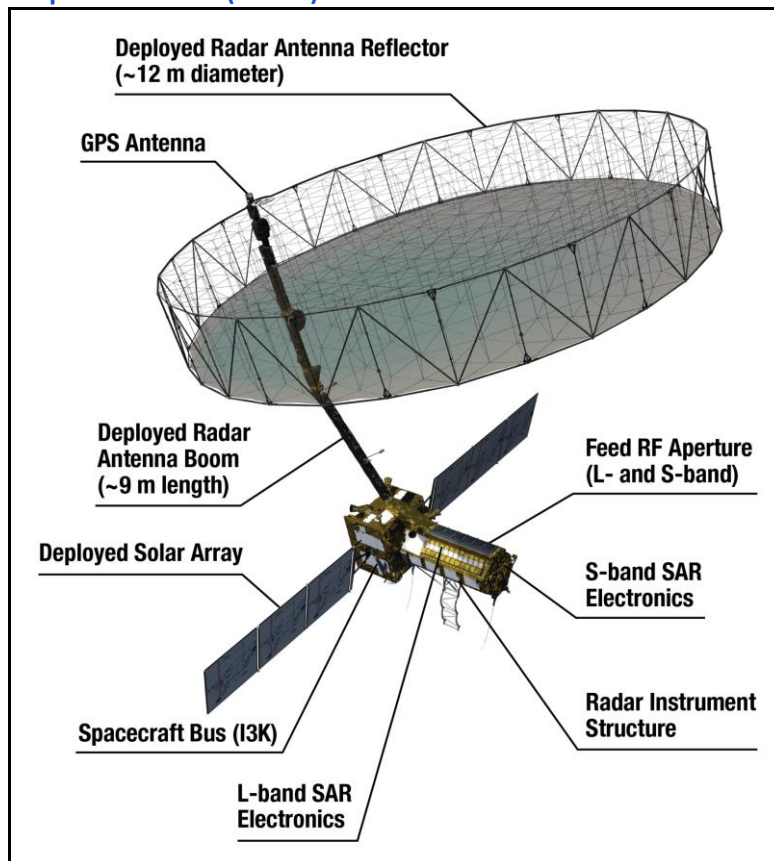
Source: [PIB](#)

## NISAR Satellite

### Context

NISAR is set to be launched from Satish Dhawan Space Centre (Sriharikota) on July 30.

### NASA-ISRO Synthetic Aperture Radar (NISAR)



- **Development:** It is a satellite jointly developed by NASA and ISRO for Low Earth Orbit (LEO) observation.
- **Size and Weight:** It is an SUV-sized satellite, weighing around 2,800 kilograms.
- **Objective:** To monitor tectonic movements, water bodies, water stress, vegetation cover, snow cover, and more.
  - **Earth Surface Monitoring:** Tracks subtle changes in the Earth's surface.
  - **Volcanic Eruptions:** Spots warning signs of imminent volcanic eruptions.
  - **Groundwater Monitoring:** Helps monitor groundwater supplies.
  - **Ice Sheet Tracking:** Tracks the rate at which ice sheets are melting.
- **Duration:** 3 years.
- **Function:** Can fully cover Earth in 14-15 days.
  - **Imaging Frequency:** Captures images of Earth's land, ice sheets, and sea ice every 12 days.
  - **Surface Movement Detection:** Detects the earth's surface movement as small as 0.4 inches over an area.
- **Features:**
  - **Dual Frequency:** Equipped with **L-band and S-band radars**.
    - **NASA Contribution:** L-band radar, GPS, solid-state recorder, and payload data subsystem.
    - **ISRO Contribution:** S-band radar, GSLV launch system, and spacecraft.

- **Antenna Reflector:** Features a large 39-foot fixed antenna reflector to focus radar signals emitted and received by the upward-facing feed on the instrument structure.

#### Other Missions by ISRO

##### Chandrayaan-4:

- Conceptual stage, aims to bring back samples from the moon.
- Part of a series of missions leading to a manned lunar landing by 2040.
- Requires a new rocket and innovative methods for sample collection and return.

##### Spadex (Space Docking Experiment):

- Involves two satellites docking in space.
- Satellites have been built and are undergoing testing.
- Targets a launch by the end of the year.
- Precursor to the ISRO building a space station.

##### Gaganyaan Mission:

- Helicopter airdrop tests of the crew module are ongoing.
- Preparing for the unmanned mission (G-1) and abort test.
- Four astronauts will be sent to the U.S. for training.
- One astronaut will fly to the International Space Station.

##### Sukhrayaan Mission:

- Aims to send a probe to Venus.
- Designs and configurations are complete.
- Awaiting government approval.

##### New Application Areas for Satellites

- **Bharatiya Antariksha Station:** Planned space station with the first module launch targeted by 2028.
- **New Generation Launch Vehicle (NGLV):** Named Surya, under development.
- **Quantum Key Distribution Satellite:** Aimed at secure communication.
- **Software-Defined Radio Satellite:** A communication satellite in development.
- **Aircraft Monitoring Constellation (ADS):** A satellite constellation to monitor all aircraft in Indian airspace and assist airport authorities in managing air traffic.

Source: [The Hindu](#)

## What is the legal status of right to vote?

### Context

The Supreme Court is currently hearing petitions challenging the Special Intensive Revision (SIR) of electoral rolls in Bihar. A key issue in the debate is the legal status of the 'right to vote.'

Different Types Right in India		
Type of Right	Definition	Examples
Natural Rights	Inherent and inalienable rights, derived from human nature and reason.	Right to life, liberty, and privacy. Not directly enforceable in courts unless codified.
Fundamental Rights	Guaranteed under <b>Part III</b> of the Constitution and enforceable by the Supreme Court under Article 32.	Right to equality (Art. 14), freedom of speech (Art. 19), right to life (Art. 21), etc.
Constitutional Rights	Rights provided <b>elsewhere in the Constitution</b> (outside Part III).	Right to vote (Art. 326), Right to property (Art. 300A), freedom of trade (Art. 301)
Statutory (Legal) Rights	Rights granted by <b>ordinary laws passed by Parliament or State legislatures</b> .	Right to education under RTE Act, right to food under NFSA, MGNREGA employment right

### Right to Vote

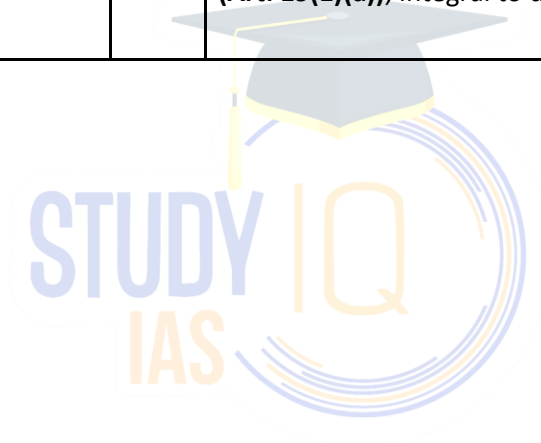
- The right to vote is **not a Fundamental Right** but is a **statutory right**.
- It is mentioned under **Article 326** in the Constitution of India.
- The **61st Constitutional Amendment Act, 1988** reduced the **voting age (21 to 18 years)** in India.
- The right to vote is not absolute—subject to citizenship, age, residence, & legal disqualifications.
  - **Representation of the People Act, 1950:**
    - **Section 62:** Only those listed in the electoral roll can vote.
    - Disqualifies those in **prison** or disqualified by law
    - **Section 16:** Non-citizens cannot vote.
    - **Section 19:** Must be 18+ and **ordinarily resident** in the constituency.

Judicial Interpretation: Is the Right to Vote a Fundamental, Constitutional, or Statutory Right?		
Case Name	Year	Court's Ruling
N.P. Ponnuswami v. Returning Officer	1952	<b>Statutory right</b> – Voting is created and regulated by statute (RP Acts).
Jyoti Basu v. Debi Ghosal	1982	Reaffirmed voting is <b>neither a fundamental right nor a common law right</b> , only <b>statutory</b> .

**Judicial Interpretation: Is the Right to Vote a Fundamental, Constitutional, or Statutory Right?**

<b>PUCL v. Union of India</b>	2003	Justice P.V. Reddy observed voting may be a <b>constitutional right</b> , though not fundamental.
<b>Kuldip Nayar v. Union of India</b>	2006	Constitution Bench reaffirmed that the <b>right to vote is a statutory right</b> .
<b>Rajbala v. State of Haryana</b>	2015	Division Bench held voting is a <b>constitutional right</b> , based on PUCL judgment.
<b>Anoop Baranwal v. Union of India</b>	2023	Majority opinion reaffirmed Kuldip Nayar: <b>right to vote is only a statutory right</b> .
<b>Justice Ajay Rastogi (Dissent in Anoop Baranwal)</b>	2023	Argued that right to vote expresses <b>freedom of choice (Art. 19(1)(a))</b> , integral to <b>democracy</b> .

Source: [The Hindu](#)



## News in Short

### Typhoon Wipha

**News?** Tropical cyclone Wipha made landfall in northern Vietnam.

- Impacted Vietnam, China (especially Hainan and Guangdong), and the Philippines.

#### About Tropical Cyclone

- A **tropical cyclone** is a rapidly rotating storm system originating over **warm tropical oceans**, characterized by: a **low-pressure center** (called the eye), strong rotating winds, heavy rain, thunderstorms.
- **Condition for Formation: Warm ocean temperatures** of at least **26–27°C (79–81°F)**
  - **High moisture content** in the atmosphere
  - **Low to moderate wind shear**
  - **Coriolis force** (due to Earth's rotation) to initiate cyclonic spin.
- **Regional Names:**
  - **Willy-willy** (Australia)
  - **Hurricane** (Northern Atlantic)
  - **Typhoon** (Western North Pacific).

Source: [NDTV](#)

### SASCI Scheme

**News?** The Ministry of Tourism issued operational guidelines for '**Special Assistance to States for Capital Investment – Development of Iconic Tourist Centres to Global Scale**'(SASCI) scheme.

#### About SASCI Scheme

- **Launched:** 2020-21, tourism component launched in **2024-25**.
- **Key Features:**
  - **Form of Support**→Interest-free loans to states
  - **Loan Tenure**→50 years Project
  - **Type**→Capital infrastructure (e.g. roads, tourism hubs, logistics, green energy).

Source: [PIB](#)

## Places in News

### Kamchatka Peninsula



**News?** A series of powerful earthquakes strike Kamchatka Peninsula.

- **Location:** Eastern part of Russia.
  - Between the Sea of Okhotsk (west) and the Pacific Ocean & Bering Sea (east).

**Source:** [Newsonair](#)

## Editorial Summary

### Intellectual freedom

#### Context

Across democracies, including India and the U.S., rising censorship, curriculum control, and suppression of dissent threaten intellectual freedom.

“Freedom **only for the supporters of the government**, only for the supporters of one party — however numerous they may be — is **no freedom at all**. Freedom is always and exclusively the freedom of the one who thinks differently.” — **Rosa Luxemburg**

#### Importance of Intellectual Freedom in a Democracy

- **Foundation of Democratic Discourse:** Intellectual freedom enables open debate, dissent, and critical inquiry — the lifeblood of a functioning democracy. It allows citizens to hold power accountable and to participate meaningfully in civic life.
- **Enabler of Social Progress:** Free academic and intellectual spaces foster innovation, cultural advancement, and solutions to societal problems through independent research and dialogue.
- **Strengthening National Unity through Diversity:** Genuine national cohesion emerges from inclusive dialogue, not enforced conformity. Listening to diverse voices fosters a stronger and more resilient social fabric.
- **Moral and Global Legitimacy:** Democracies that uphold intellectual freedom command greater global respect and soft power. Nations aiming for leadership on the world stage must be exemplars of internal openness.

#### Issues Undermining Intellectual Freedom

- **Crackdowns on Dissent:** Around the world — including U.S. campuses during pro-Palestinian demonstrations — peaceful dissent is often met with administrative or legal suppression, signaling shrinking democratic space.
- **Curricular Rewriting for Ideological Goals:** Educational curricula are being altered to reflect partisan or nationalist ideologies, rather than historical accuracy or academic integrity, eroding the intellectual rigor of institutions.
  - E.g., Textbooks revised to delete chapters on Mughal history, caste movements, and 2002 Gujarat riots.
- **Weaponization of Terms like “Anti-National”:** Critical voices — including scholars, writers, and activists — are often branded “anti-national” or “seditious,” delegitimizing dissent and discouraging open debate.
  - E.g., Activists & reporters have faced arrest under UAPA.
- **Geopolitical Irony:** Nations seeking global influence often simultaneously stifle dissent at home, creating a contradiction between their democratic self-image and authoritarian impulses — undermining both credibility and trust.
- **Institutional Pressure and Censorship:** Universities and media outlets are increasingly coerced into compliance through funding threats, firings, and legal intimidation, leading to self-censorship and intellectual stagnation.

#### Consequences of Intellectual Repression

- **Erosion of Academic Excellence:** Fear-based conformity discourages honest inquiry, leading to mediocrity in research, education, and scholarship.

- **Diminished Critical Thinking:** Societies that suppress dissent produce citizens who are less equipped to analyze, question, and innovate — essential traits in the modern world.
- **Alienation of Youth and Scholars:** A generation that sees universities become sites of ideological control rather than free thought becomes disillusioned, disengaged, or radicalized.
- **Moral Decline of Democracy:** When intelligence and conscience are policed, democracy loses its ethical foundations and drifts toward authoritarianism masked as unity.
- **International Reputational Damage:** Suppressing freedoms while promoting democratic values abroad leads to accusations of hypocrisy, weakening global standing and alliances.

#### Way Forward

- **Strengthen Institutional Autonomy:** Ensure that universities, media houses, and think tanks remain free from political interference to maintain independent inquiry.
- **Promote Legal Protections for Free Speech:** Reinforce constitutional and legal safeguards that protect dissenting voices from arbitrary action and legal harassment.
- **Foster Democratic Education:** Encourage curricula that promote critical thinking, historical awareness, and pluralism over ideology-driven narratives.
- **Encourage Civil Discourse:** Promote a culture where disagreement is not vilified but valued, creating space for constructive dialogue across ideological divides.
- **Hold Leadership Accountable:** Civil society, media, and global watchdogs must call out suppression wherever it occurs to uphold international norms of democracy.
- **Global Democratic Solidarity:** Democracies must support each other in maintaining open societies, resisting authoritarian trends both domestically and abroad.

Source: [The Hindu](#)



## India–U.K. Free Trade Agreement (FTA) and Global Capability Centres (GCCs)

### Context

The United Kingdom-India Free Trade Agreement could be a catalyst for deeper engagement in the GCCs.

### Significance of the India-UK Free Trade Agreement (FTA)

- **Strengthening Bilateral Ties:** The FTA is poised to redefine India-UK economic relations, moving beyond traditional trade to focus on services, innovation, and talent exchange.
- **Post-Brexit Opportunity for the UK:** The FTA offers the UK access to one of the world's fastest-growing digital and services economies—India—helping reinforce its global role in services and tech.
- **Economic Boost for India:** For India, the FTA promises increased UK investment, alignment with digital skilling goals, and expansion of high-value service exports.
- **Enabling Framework:** By addressing double taxation, data localisation issues, and regulatory mismatches, the FTA can remove key barriers faced by businesses.

### What are GCC's ?

- It is a strategic outpost/branch set up by multinational corporations (MNCs) to perform specialised functions for their parent organisation.
- **Functions of GCC:**
  - **Driving Innovation:** Create new products or services, and conduct research.
  - **Managing Technology:** Handling IT systems, software development, cybersecurity, and other tech needs.
  - **Handling Back-Office Tasks:** They take care of finance, human resources, procurement, and customer support.
  - **Ensuring Compliance:** They make sure the company meets legal requirements and manages risks in global operations.
- In India, GCCs have **evolved into Innovation Hubs and Centers of Excellence (CoEs).**
- **Top Destinations** for setting up GCCs in India: Bengaluru, Gurugram, Hyderabad, Mumbai, Delhi-NCR, and GIFT City

### FTA a Catalyst for Global Capability Centres (GCCs)

- India hosts over 1,500 GCCs, employing 1.9+ million professionals. These centers serve as innovation hubs for global corporations in R&D, cybersecurity, analytics, etc.
- British firms increasingly see India not as a cost-cutting hub but as a co-innovation partner for high-end digital solutions.
- The agreement can facilitate smoother movement of professionals and harmonised digital/data governance—key to scaling GCCs serving UK-based firms.
- With proper policy backing, Indian GCCs can climb higher up the global value chain and attract more British collaborations.

### Government Push for GCCs

- **Central Government Initiatives:**
  - **National GCC Framework (Budget 2025):** Under MeitY, in collaboration with NASSCOM, KPMG, Zinnov, and Invest India, a framework is being created to guide states on talent, infrastructure, and legal facilitation.
  - **No National Policy Yet:** Despite rapid organic growth, there is no single national policy, prompting debate on whether one is needed.
- **State-Level Momentum:**
  - **Uttar Pradesh Example:** Hosted its first GCC Conclave (with TCS, Microsoft, HCL, etc.) showcasing tier-2 cities (Lucknow, Varanasi) as new GCC destinations.

### Likely Impact of the FTA and GCC Growth

- **Boost to Innovation & Employment:** More GCCs mean high-skill job creation and R&D growth, aligning with India's digital transformation goals.
- **Cross-Border Talent Mobility:** Easier professional movement between the UK and India could enhance talent exchange and diversity in both markets.
- **Knowledge Corridor:** GCCs can help build a robust India-UK knowledge economy corridor, driving global competitiveness.
- **Investor Confidence:** A well-designed FTA addressing real-world business frictions (e.g., taxation, data issues) can send strong positive signals to investors.

Source: [The Hindu](#)

