
Prelims Exam Topics

INDIA'S FIRST EVTOL AIRCRAFT (E200X)

Context

The ePlane Company, an IIT Madras-incubated startup, unveiled e200X (PT-01), India's first full-scale prototype of an electric Vertical Take-off and Landing (eVTOL) aircraft.

About e200X

- **Type:** A battery-powered, zero-emission eVTOL aircraft (air taxi) capable of vertical take-off and landing before transitioning to winged forward flight.
- **Developer & Technology:** Developed by The ePlane Company (Chennai), featuring six lift rotors for vertical take-off, four propellers for forward flight, and a multi-motor system that ensures safe flight even if one motor fails.
- **Operations:** Designed to operate from existing helipads and hospital rooftops, and extensively tested using virtual simulations and over 10,000 km of trial flights.
- **Applications:** Supports medical evacuation, airport transfers, and urban logistics, enabling faster transportation by bypassing traffic congestion.
- **eVTOL:** An Electric Vertical Take-off and Landing aircraft that combines helicopter-like vertical flight with airplane-like forward flight.

ANGEN (INVISIBLE)

Context

Angen (Invisible) became the first Santhali-language film to win a National Film Award, with Ravi Raj Murmu receiving the Best Debut Film of a Director (Non-Feature Category) at the 72nd National Film Awards.

About Angen

- **Type:** A 12-minute Santhali short film inspired by an indigenous folktale, highlighting the cultural heritage of the Santhal tribal community.
- **Director:** Written and directed by Ravi Raj Murmu.

BATUKESHWAR DUTT

Context

The **Union Home Minister** paid tributes to **Batukeshwar Dutt** on his **death anniversary**, commemorating his contribution to India's freedom struggle.

About Batukeshwar Dutt

- **Background:** An Indian **socialist revolutionary** and a key member of the **Hindustan Socialist Republican Association (HSRA)**, best known for the **1929 Central Legislative Assembly bombing** alongside **Bhagat Singh**.
- **Central Assembly Bombing (1929):** Along with **Bhagat Singh**, threw **non-lethal bombs** and distributed revolutionary leaflets in the **Central Legislative Assembly** to protest the **Public Safety Bill** and **Trade Disputes Bill**, while raising the slogan "**Inquilab Zindabad**."
- **Imprisonment:** Sentenced to **transportation for life (Kala Pani)** in the **Cellular Jail**, where he participated in **hunger strikes** demanding better treatment for political prisoners.

BELWA-MINAPUR LINK CHANNEL (BELWADHAR)

Context

The **Bihar Chief Minister** inaugurated the **Belwa-Minapur Link Channel (Belwadhar)**, Bihar's **first completed river-linking project**, in **Sheohar district**.

About Belwa-Minapur Link Channel

- **Type:** An **artificial water diversion channel** forming the first phase of the **Bagmati-Budhi Gandak River Interlinking Project** and the **Bagmati Flood Management Project**.
- **Location:** Extends from **Belwa Ghat (Sheohar district)** to **Minapur (Muzaffarpur district)**, linking the **Bagmati and Budhi Gandak** river basins.
- **Objective:** Diverts **surplus floodwaters of the Bagmati River** into the **Budhi Gandak River** to reduce flooding and improve water availability.

QDENG (TAK-003)

Context

The **Drug Controller General of India (DCGI)** granted **market authorisation** to **QDENG (TAK-003)**, making it the **first dengue vaccine approved in India**.

About QDENG (TAK-003)

- **Developer:** Developed by **Takeda**, a Japanese biopharmaceutical company.
- **Type:** A **live-attenuated tetravalent dengue vaccine** providing protection against **all four dengue virus serotypes (DENV-1 to DENV-4)**.
- **Eligibility:** Approved for individuals aged **4–60 years**, irrespective of prior dengue infection, without requiring **pre-vaccination screening**.
- **Dengue:** A **mosquito-borne viral disease** caused by the **dengue virus (DENV-1 to DENV-4)** and transmitted primarily by **Aedes aegypti** mosquitoes.

CENTRAL BUREAU OF NARCOTICS (CBN)

Context

The **Central Bureau of Narcotics (CBN)** foiled an attempt to illegally divert an export consignment of **high-strength Tramadol Hydrochloride tablets**.

About Central Bureau of Narcotics

- **Type:** A **central law enforcement agency** responsible for regulating the **licit trade of narcotic drugs, psychotropic substances, and precursor chemicals**.
- **Ministry:** Functions under the **Department of Revenue, Ministry of Finance**, with its headquarters in **Gwalior, Madhya Pradesh**.
- **Legal Framework:** Operates under the **Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985**.

KALA SANSKRITI VIKAS YOJANA (KSVY)

Context

The **Union Minister for Culture** informed the **Lok Sabha** about the implementation of the **Kala Sanskriti Vikas Yojana (KSVY)**.

About Kala Sanskriti Vikas Yojana (KSVY)

- **Type:** A **Central Sector Scheme** of the **Ministry of Culture** for the **promotion, preservation, and development of India's art and cultural heritage**.
- **Beneficiaries:** Provides financial assistance to **artists, cultural institutions, NGOs, and other organizations engaged** in cultural activities.

- **Heritage Conservation:** Promotes the preservation of **tangible and intangible cultural heritage**, including **UNESCO-recognised traditions**, through **documentation, digitisation, and skill development**.
- **Infrastructure & Inclusion:** Funds the development of **auditoriums, museums, and cultural centres**, while encouraging participation of **rural, tribal, and marginalized communities** and promoting **cultural tourism**.

E-SHRAM PORTAL

Context

The **e-Shram Portal** has registered **over 31.78 crore unorganised workers**, becoming **India's largest digital database** for the informal workforce.

About e-Shram Portal

- **Launch:** Introduced by the **Ministry of Labour and Employment**.
- **Purpose:** Aims to create the **National Database of Unorganised Workers (NDUW)** to facilitate delivery of social security and welfare benefits.
- **Coverage:** Registers **unorganised workers**, including **migrant, construction, gig, and platform workers**.
- **Registration:** Provides a **Universal Account Number (UAN)** linked to **Aadhaar** through a simple self-registration process.
- **Welfare Integration:** Connects workers with **social security schemes, employment opportunities, skill development, pensions, and Direct Benefit Transfers (DBT)**.

MOLDOVA

Context

The **President of India** visited **Moldova**, marking the **first-ever visit by an Indian President** to the country.

About Moldova

- **Location:** A **landlocked country in Eastern Europe**, situated between the **Prut and Dniester** rivers, bordered by **Romania** to the west and **Ukraine** to the north, east, and south.
- **Economy:** Predominantly **agricultural**, with **viticulture and wine production** forming a major part of its economy.

- **Geography:** Located east of the Carpathian Mountains in the Prut–Dniester river basin.



Mains Exam Topics

COMMERCIALISATION OF SPACE

Context:

The successful launch of **Vikram-1**, India's first privately developed orbital rocket by **Skyroot Aerospace**, marks a watershed in India's space sector, showcasing the impact of space-sector reforms, expanding private participation, and the transition from an ISRO-led programme to a globally competitive commercial space ecosystem.

How has the growing demand for small satellite launches reshaped global competition in the launch services market?

- **Cost Competition:** Competition has shifted from maximizing payload per mission to minimizing launch cost per kilogram, making reusability and economies of scale the primary competitive advantages.
 - e.g., SpaceX's reusable Falcon 9 significantly lowered launch costs, while Ariane 6 focuses on manufacturing efficiencies to remain cost competitive.
- **Launch Flexibility:** Dedicated small-launch providers compete by offering rapid deployment and mission-specific orbital insertion, whereas cost-sensitive customers increasingly prefer lower-cost rideshare launches.
 - e.g., Rocket Lab's Electron serves time-critical and orbit-specific missions despite the lower-cost rideshare alternatives.
- **Service Integration:** Competition increasingly extends beyond launch capability to end-to-end deployment services, including rideshare integration, orbital transfer, and mission management, creating new value-added business models.
 - e.g., SpaceX's rideshare programme is complemented by D-Orbit's orbital transfer vehicles (OTVs) for last-mile orbital delivery.
- **Market Access:** Lower-cost small-launch systems have enabled private firms and emerging space nations to enter the launch market for small payloads, expanding competition without directly displacing heavy-lift providers.
 - e.g., ISRO's SSLV complements GSLV/LVM3 by serving the dedicated small-satellite launch segment.

- **Contract Competition:** Mega-constellations require continuous satellite replenishment rather than one-time launches, making launch cadence, reliability, and long-term contracts key competitive differentiators.
 - e.g., OneWeb secured multi-launch agreements with Arianespace and ISRO to support sustained constellation deployment.

How has the democratisation of access to space reshaped technological capabilities among nations?

- **Lower Entry Barriers:** Affordable launches have enabled many developing nations to deploy satellites without indigenous launch capability, reducing the divide between spacefaring and non-spacefaring countries.
 - e.g., Several African and Southeast Asian countries launched their first satellites through Falcon 9 and PSLV rideshare missions.
- **Human Capital Development:** Standardised CubeSat platforms have enabled universities and emerging space agencies to gain systems integration experience and develop a skilled aerospace workforce, even though core technologies are often imported.
 - e.g., Bhutan and Nepal developed their first satellites through university-led CubeSat programmes.
- **Functional Access:** Commercial Earth observation, communication, and navigation services enable countries to benefit from space applications without building indigenous space infrastructure, improving service access but not technological capability.
 - e.g., Governments use Planet Labs imagery for agriculture, disaster management, and resource monitoring.
- **Advanced Technology Divide:** Frontier capabilities such as reusable launch systems, heavy-lift rockets, human spaceflight, deep-space exploration, and independent navigation constellations remain concentrated among a few technologically advanced nations.
 - e.g., The US, China, Russia, and India continue to dominate these strategic technologies.
- **Strategic Dependence:** Reliance on foreign launch providers, satellite platforms, and navigation systems can limit technological autonomy, leaving many nations dependent on external space ecosystems for critical capabilities.
 - e.g., Most countries rely on foreign Global Navigation Satellite Systems (GPS, Galileo, or BeiDou) instead of operating indigenous navigation constellations.

How should India balance ease of innovation with national security in the private space sector?

- **Secure Foreign Investment:** Encourage global capital and technology partnerships while retaining Indian control over strategically sensitive space assets and launch capabilities.
 - e.g., India's liberalised space FDI policy permits higher foreign investment under defined thresholds with government approval for sensitive segments.
- **Risk-Based Regulation:** Fast-track low-risk commercial activities through single-window approvals while applying tiered licensing and enhanced scrutiny only to sensitive technologies such as high-resolution imaging, advanced propulsion, and dual-use systems.
 - e.g., IN-SPACe facilitates private space activities, while India's Remote Sensing Policy imposes stricter controls on high-resolution satellite imagery.
- **Indigenous Capability:** Encourage technology transfer, R&D partnerships, and access to testing infrastructure so private firms build indigenous capabilities instead of remaining dependent on imported technologies.
 - e.g., IN-SPACe enables private companies to access ISRO's facilities and technical expertise for developing space technologies.
- **Balanced Data Governance:** Protect sensitive geospatial and satellite data through appropriate security standards while enabling responsible commercial use and innovation.
 - e.g., India's Geospatial Guidelines regulate sensitive geospatial data while liberalising non-sensitive datasets.
- **Responsible Technology Exports:** Align export controls with national security objectives while streamlining compliance for trusted private firms participating in global space supply chains.
 - e.g., India's SCOMET framework, aligned with MTCR commitments, regulates exports of dual-use space technologies.