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Daily PIB Summary

18 July, 2026

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1. VIKRAM-1: CHARTING INDIA'S COSMIC FUTURE

- **Vikram-1** is an indigenously developed orbital launch vehicle designed by **Skyroot Aerospace**, a Hyderabad-based space technology startup.
- It is intended to launch **small satellites** into Low Earth Orbit (LEO), catering to the rapidly expanding global small satellite market.
- The rocket incorporates advanced technologies such as **carbon-composite structures**, **3D-printed engines**, and modular design to reduce launch costs and improve efficiency.
- Vikram-1 is expected to provide dedicated launch services, enabling quicker deployment of satellites compared to rideshare missions.
- The project showcases the growing capabilities of India's private space ecosystem following the opening of the space sector to non-government entities.
- It complements ISRO's efforts by expanding India's commercial launch capacity and encouraging innovation.
- The mission supports the objectives of **Atmanirbhar Bharat**, **Make in India**, and the commercialization of space technology.
- Successful deployment of Vikram-1 would strengthen India's position in the global space economy.

BACKGROUND / CONTEXT

Skyroot Aerospace

- **Founded: 2018**.
- **Headquarters: Hyderabad, Telangana**.
- One of India's leading private space startups developing launch vehicles for small satellite missions.
- Achieved a major milestone with **Vikram-S**, India's first privately developed rocket to be successfully launched in **2022**.

Vikram-1 Launch Vehicle

I. Designed as a **three-stage orbital launch vehicle**.

II. Intended primarily for launching **small satellites** into **Low Earth Orbit (LEO)**.

III. Key features include:

A. Carbon-fibre composite structures.

B. 3D-printed rocket engines.

C. High-performance propulsion systems.

D. Cost-effective and rapid launch capability.

India's Space Sector Reforms

- **2020:** Government opened the space sector to private participation.
- Establishment of **IN-SPACe (Indian National Space Promotion and Authorization Centre)** to promote and regulate private sector participation.

- **NewSpace India Limited (NSIL)** commercializes ISRO's space technologies and launch services.

KEY HIGHLIGHTS

- **Mission:** Vikram-1.
- **Developer:** Skyroot Aerospace.
- **Primary Objective:** Launch small satellites into Low Earth Orbit.
- **Technological Significance:** Demonstrates indigenous launch vehicle technology, 3D printing, and lightweight composite materials.
- **Economic Significance:** Expands India's commercial launch market and strengthens the private space ecosystem.
- **Strategic Significance:** Enhances self-reliance in space transportation and satellite deployment.
- **Challenges:** High launch costs, global competition, reliability validation, and scaling commercial operations.
- **Way Forward:** Strengthen public-private partnerships, expand launch infrastructure, encourage investment in space startups, and accelerate innovation in reusable launch technologies.

PRELIMS BOOSTER BOX

- **Skyroot Aerospace:** Hyderabad-based private space startup founded in **2018**.
- **Vikram-S:** India's first privately developed rocket successfully launched in **2022** under the **Prarambh Mission**.
- **Vikram-1:** Skyroot's first orbital launch vehicle designed for launching small satellites.
- **IN-SPACe (Indian National Space Promotion and Authorization Centre):** Established in **2020** as an autonomous agency under the **Department of Space** to promote and authorize private participation in the space sector.
- **NewSpace India Limited (NSIL):** Commercial arm of **ISRO**, incorporated in **2019** to commercialize space technologies and launch services.
- **ISRO: Indian Space Research Organisation**, established in **1969** under the **Department of Space**.
- **Low Earth Orbit (LEO):** Orbit extending up to about **2,000 km** above Earth's surface; commonly used for Earth observation, communication, and scientific satellites.
- **Small Satellites:** Typically satellites weighing **less than 500 kg**, widely used for communication, remote sensing, navigation, and research.
- **3D Printing (Additive Manufacturing):** Technology used to manufacture complex rocket components with reduced material wastage and shorter production time.
- **Indian Space Policy, 2023:** Encourages greater participation of non-government entities in the entire space value chain.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. **Vikram-1** is an orbital launch vehicle being developed by **Skyroot Aerospace**.
2. **IN-SPACe** is an autonomous agency under the **Department of Space** that promotes and authorizes private participation in India's space sector.
3. **Low Earth Orbit (LEO)** generally extends up to about **2,000 km** above the Earth's surface.

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: (d)

2. NATIONAL COMMISSION FOR SAFAI KARAMCHARIS REVIEWS SANITATION AND WELFARE FACILITIES

- The Commission reviewed the availability of sanitation infrastructure, safety equipment, rehabilitation measures, and welfare facilities for Safai Karamcharis.
- It stressed the need for **100% mechanization of sewer and septic tank cleaning** to eliminate hazardous manual cleaning.
- Discussions focused on providing adequate **Personal Protective Equipment (PPE)**, occupational safety, health insurance, and social security benefits.
- The Commission emphasized strict implementation of laws prohibiting manual scavenging and ensuring rehabilitation of affected persons.
- It reviewed the progress of schemes aimed at the socio-economic empowerment and skill development of sanitation workers.
- The initiative supports the objectives of **Swachh Bharat Mission (SBM)** by promoting safe and dignified sanitation services.
- The review also highlighted the importance of coordination among State Governments, Urban Local Bodies (ULBs), and implementing agencies.
- Strengthening sanitation worker welfare contributes to inclusive urban development and public health.

BACKGROUND / CONTEXT

National Commission for Safai Karamcharis (NCSK)

- **Constituted: 1994** under the **National Commission for Safai Karamcharis Act, 1993**.
- It currently functions as a **non-statutory body** under the **Ministry of Social Justice and Empowerment**, with its tenure extended periodically by the Government.
- Advises the Government on issues relating to the welfare, rehabilitation, and socio-economic development of Safai Karamcharis.

Functions of NCSK

- Monitor the implementation of welfare measures.
- Recommend policies for rehabilitation and social security.
- Review grievances relating to Safai Karamcharis.
- Promote occupational safety and dignity of labour.
- Monitor implementation of laws relating to manual scavenging.

Manual Scavenging

- Refers to the manual cleaning, carrying, disposing, or handling of human excreta from insanitary latrines, open drains, sewers, or septic tanks, as prohibited by law.

MAJOR GOVERNMENT INITIATIVES

Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013

- Prohibits manual scavenging.

- Provides for identification, liberation, and rehabilitation of manual scavengers.
- Bans hazardous manual cleaning of sewers and septic tanks except under strictly regulated emergency conditions with prescribed safety measures.

NAMASTE Scheme

I. **National Action for Mechanised Sanitation Ecosystem (NAMASTE)**.

II. Jointly implemented by the **Ministry of Social Justice and Empowerment** and the **Ministry of Housing and Urban Affairs**.

III. Promotes:

A. Mechanized sewer cleaning.

B. Occupational safety.

C. Skill development.

D. Health insurance.

E. Livelihood support for sanitation workers.

Swachh Bharat Mission (SBM)

- Promotes scientific sanitation, safe waste management, and elimination of insanitary practices.

KEY HIGHLIGHTS

- **Organisation:** National Commission for Safai Karamcharis (NCSK).
- **Focus:** Welfare, safety, rehabilitation, and dignity of sanitation workers.
- **Primary Objective:** Eliminate hazardous sanitation practices and strengthen worker welfare.
- **Social Significance:** Promotes dignity, social justice, and inclusion of sanitation workers.
- **Health Significance:** Reduces occupational hazards through mechanization and safety measures.
- **Governance Significance:** Improves implementation of sanitation and labour welfare policies.
- **Challenges:** Incomplete mechanization, unsafe working conditions, inadequate protective equipment, and social stigma.
- **Way Forward:** Accelerate mechanized sanitation, ensure universal PPE coverage, strengthen rehabilitation and social security, improve skill development, and enforce anti-manual scavenging laws effectively.

PRELIMS BOOSTER BOX

- **National Commission for Safai Karamcharis (NCSK):** Constituted in **1994**; currently functions as a **non-statutory body** under the **Ministry of Social Justice and Empowerment**.
- **National Commission for Safai Karamcharis Act, 1993:** Established the original statutory Commission; the Act later lapsed, and the Commission continues through periodic extensions.
- **Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013:** Prohibits manual scavenging and provides for rehabilitation of identified manual scavengers.
- **NAMASTE: National Action for Mechanised Sanitation Ecosystem**, launched in **2022** to promote mechanized sanitation and improve the safety and livelihoods of sanitation workers.
- **Swachh Bharat Mission (SBM):** Launched on **2 October 2014** to achieve universal sanitation and scientific waste management.
- **Personal Protective Equipment (PPE):** Includes gloves, helmets, masks, boots, and protective clothing to reduce occupational risks.
- **Manual Scavenging:** Practice of manually cleaning or handling human excreta; prohibited under Indian law.
- **Article 21:** Guarantees the **Right to Life and Personal Liberty**, interpreted by the Supreme Court to include the right to live with dignity.
- **Article 46:** Directs the State to promote the educational and economic interests of weaker sections and protect them from social injustice and exploitation.

- **Occupational Safety:** Measures adopted to protect workers from workplace hazards and ensure safe working conditions.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. The **National Commission for Safai Karamcharis (NCSK)** currently functions as a **non-statutory body** under the **Ministry of Social Justice and Empowerment**.
2. The **Prohibition of Employment as Manual Scavengers and their Rehabilitation Act, 2013** prohibits manual scavenging and provides for the rehabilitation of identified manual scavengers.
3. The **NAMASTE Scheme** promotes mechanized sanitation and improves the safety and welfare of sanitation workers.

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: (d)

3. OPERATION SINDOOR DEMONSTRATED INDIA'S WORLD-CLASS DEFENCE READINESS SHARPENED BY GOVERNMENT'S 'NATION FIRST' & 'FORCES FIRST' RESOLVE: RAKSHA MANTRI

I. **Operation Sindoor** showcased India's enhanced military readiness, operational preparedness, and jointness among the Armed Forces.
II. The Raksha Mantri emphasized that sustained investments in defence modernization, indigenous manufacturing, and force capability enhancement have significantly strengthened India's defence posture.
III. The operation highlighted the effectiveness of:
    A. Joint military planning.
    B. Advanced surveillance and intelligence.
    C. Precision strike capabilities.
    D. Network-centric warfare.
    E. Indigenous defence technologies.
IV. It reaffirmed the Government's commitment to ensuring the highest standards of operational readiness under the principles of **"Nation First"** and **"Forces First"**.
V. The operation also reflected the increasing role of **Aatmanirbhar Bharat in Defence**, with greater reliance on indigenously developed defence equipment.
VI. It demonstrated India's ability to respond swiftly to emerging security challenges while maintaining strategic deterrence.
VII. The success reinforces India's objective of building a modern, self-reliant, and technologically advanced military.

BACKGROUND / CONTEXT

Operation Sindoor

I. A significant military operation highlighting the preparedness, coordination, and operational capability of the Indian Armed Forces.
II. Demonstrated:
    A. Jointness among the Army, Navy, and Air Force.
    B. Technology-enabled military operations.
    C. Rapid response capability.

D. Precision engagement.
E. High operational efficiency.

Aatmanirbhar Bharat in Defence

I. Seeks to strengthen indigenous defence manufacturing and reduce import dependence.
II. Focus areas include:
    A. Defence production.
    B. Defence exports.
    C. Research and Development.
    D. Innovation.
    E. Private sector participation.

Integrated Theatre Commands (ITCs)

- Proposed integrated command structure to enhance synergy among the three Services.
- Intended to improve operational efficiency, resource utilization, and joint warfighting capability.

KEY HIGHLIGHTS

- **Operation:** Operation Sindoor.
- **Focus:** Defence preparedness and operational readiness.
- **Lead Ministry:** Ministry of Defence.
- **Strategic Significance:** Enhances deterrence, national security, and rapid military response capability.
- **Technological Significance:** Demonstrates advanced surveillance, precision strike, and network-centric warfare capabilities.
- **Industrial Significance:** Highlights the role of indigenous defence production under Aatmanirbhar Bharat.
- **Challenges:** Evolving security threats, cyber warfare, emerging technologies, and maintaining high operational readiness.
- **Way Forward:** Accelerate defence modernization, strengthen indigenous R&D, promote jointness through Integrated Theatre Commands, expand defence exports, and invest in emerging technologies such as AI, drones, and cyber defence.

PRELIMS BOOSTER BOX

- **Operation Sindoor:** A military operation showcasing India's defence preparedness, jointness, and technological capability.
- **Ministry of Defence (MoD):** Responsible for coordinating and supervising all agencies relating to India's national defence.
- **Chief of Defence Staff (CDS):** Permanent head of the military's higher defence organization responsible for promoting jointness among the three Services.
- **Department of Military Affairs (DMA):** Created in **2019** under the **Ministry of Defence** and headed by the CDS.
- **Integrated Theatre Commands (ITCs):** Proposed unified military commands integrating resources of the Army, Navy, and Air Force for specific geographical or functional theatres.
- **Network-Centric Warfare (NCW):** Military operations enabled through integrated communication, surveillance, intelligence, and information-sharing networks.
- **Aatmanirbhar Bharat in Defence:** Initiative promoting indigenous design, development, manufacturing, and export of defence equipment.
- **Defence Acquisition Procedure (DAP) 2020:** Prioritizes procurement of indigenously designed, developed, and manufactured defence equipment.
- **Defence Industrial Corridors:** Established in **Uttar Pradesh** and **Tamil Nadu** to promote defence manufacturing.
- **Make in India (Defence):** Initiative encouraging domestic production and reducing dependence on defence imports.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. The **Department of Military Affairs (DMA)** was created in **2019** under the **Ministry of Defence** and is headed by the **Chief of Defence Staff (CDS)**.
2. **Integrated Theatre Commands (ITCs)** aim to enhance joint operational capability among the Army, Navy, and Air Force.
3. The **Defence Acquisition Procedure (DAP) 2020** prioritizes procurement of indigenously designed, developed, and manufactured defence equipment.

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: (d)

4. DEPARTMENT OF LAND RESOURCES EXPLORES CONVERGENCE OF DIGITAL PUBLIC INFRASTRUCTURE FOR LAND AND CREDIT WITH RBI INNOVATION HUB

- The proposed convergence seeks to integrate **digitized land records** with digital credit platforms to enable faster, transparent, and secure lending.
- Digitally verified land ownership records can simplify collateral verification, reducing delays in loan processing.
- The initiative is expected to improve access to institutional credit for farmers, rural households, and MSMEs.
- It supports the creation of interoperable Digital Public Infrastructure (DPI) for land governance and financial services.
- The integration will enhance transparency, reduce disputes, and minimize fraud in land-based lending.
- It complements ongoing land record modernization efforts under the **Digital India Land Records Modernization Programme (DILRMP)**.
- The initiative aligns with the Government's vision of **Digital India**, **financial inclusion**, and **ease of doing business**.
- It is expected to improve credit penetration while strengthening land governance and property rights.

BACKGROUND / CONTEXT

Department of Land Resources (DoLR)

I. Functions under the **Ministry of Rural Development**.
II. Responsible for:
   A. Land reforms.
   B. Land record modernization.
   C. Watershed development.
   D. Land governance.

RBI Innovation Hub (RBIH)

- **Established: 2022**.
- A wholly owned subsidiary of the **Reserve Bank of India (RBI)**.
- Promotes innovation in financial services by developing technology-driven solutions for financial inclusion and digital finance.

Digital Public Infrastructure (DPI)

Digital Public Infrastructure comprises interoperable digital systems that enable efficient delivery of public and financial services.

India's major DPI pillars include:

- Aadhaar.
- UPI.
- DigiLocker.
- Account Aggregator Framework.
- Digital Land Records.

RELATED GOVERNMENT INITIATIVES

Digital India Land Records Modernization Programme (DILRMP)

I. **Launched: 2008** (renamed in 2016).
II. **Nodal Ministry:** Ministry of Rural Development.
III. Objectives:
   A. Digitization of land records.
   B. Computerization of registration.
   C. Integration of textual and spatial records.
   D. Reduction in land disputes.

SVAMITVA Scheme

- **Launched: 2020**.
- Implemented by the **Ministry of Panchayati Raj**.
- Uses drone technology to provide legal ownership records (Property Cards) for residential properties in rural inhabited areas.

Account Aggregator (AA) Framework

- RBI-regulated consent-based framework enabling secure sharing of financial information to facilitate faster and more efficient digital lending.

KEY HIGHLIGHTS

- **Initiative:** Convergence of Digital Public Infrastructure for Land and Credit.
- **Lead Agencies:** Department of Land Resources (DoLR) and RBI Innovation Hub (RBIH).
- **Objective:** Improve access to formal credit through authenticated digital land records.
- **Economic Significance:** Enhances financial inclusion, credit availability, and ease of doing business.
- **Governance Significance:** Promotes transparent land administration and efficient land governance.
- **Technological Significance:** Strengthens interoperable Digital Public Infrastructure (DPI).
- **Challenges:** Variations in land record quality across States, unresolved land disputes, interoperability issues, data privacy, and cybersecurity.
- **Way Forward:** Complete nationwide digitization of land records, integrate cadastral maps with registration systems, strengthen data security, promote interoperability across platforms, and expand digital lending ecosystems using trusted land data.

PRELIMS BOOSTER BOX

- **Department of Land Resources (DoLR):** Department under the **Ministry of Rural Development** responsible for land reforms and land record modernization.
- **RBI Innovation Hub (RBIH):** Established in **2022** as a wholly owned subsidiary of the **Reserve Bank of India** to promote innovation in financial services.
- **Digital India Land Records Modernization Programme (DILRMP):** Launched in **2008** to modernize and digitize land records across India.
- **SVAMITVA Scheme:** Launched in **2020** by the **Ministry of Panchayati Raj** to provide legal ownership records for rural residential properties using drone surveys.
- **Digital Public Infrastructure (DPI):** Foundational digital systems enabling secure, interoperable delivery of public and financial services (e.g., Aadhaar, UPI, DigiLocker).

- **Account Aggregator (AA):** RBI-regulated consent-based data-sharing framework facilitating secure exchange of financial information.
- **Cadastral Map:** A detailed map showing land parcel boundaries and ownership information.
- **Financial Inclusion:** Ensuring affordable access to banking, credit, insurance, and other financial services.
- **Collateral:** An asset pledged by a borrower to secure a loan.
- **Ease of Doing Business:** Reforms aimed at simplifying regulatory processes and improving access to finance and public services.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

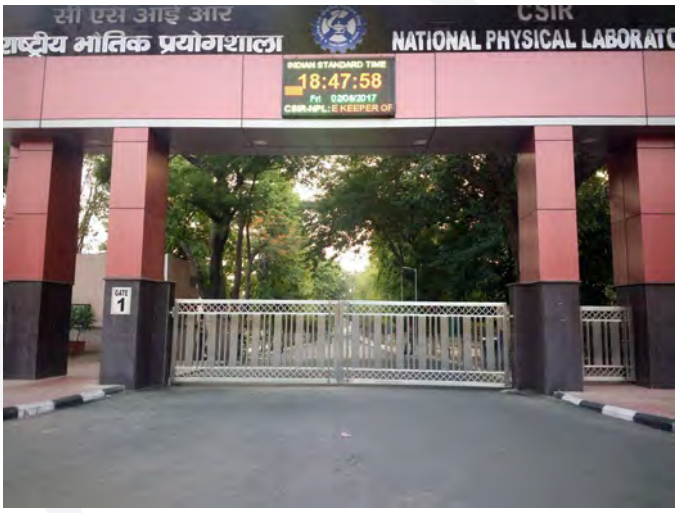
1. The **Digital India Land Records Modernization Programme (DILRMP)** aims to digitize and modernize land records across India.
2. The **SVAMITVA Scheme** provides legal ownership records for residential properties in rural inhabited areas using drone surveys.
3. The **RBI Innovation Hub (RBIH)** is a wholly owned subsidiary of the **Reserve Bank of India** established to promote innovation in financial services.

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: (d)

5. SHRI PRALHAD JOSHI COMMISSIONS WHITE RABBIT TECHNOLOGY-BASED INDIAN STANDARD TIME (IST) DISSEMINATION DEMONSTRATION NETWORK IN BENGALURU



I. The demonstration network uses **White Rabbit (WR) technology** to disseminate **Indian Standard Time (IST)** with **sub-nanosecond accuracy** over optical fibre networks.

II. It is designed to provide synchronized and highly accurate timing for critical sectors such as:
   A. Telecommunications.
   B. Power grids.
   C. Banking and financial services.
   D. Defence.
   E. Space.
   F. Scientific research.

III. The network reduces dependence on foreign satellite-based timing systems such as GPS for precision timing.

IV. It enhances cybersecurity by providing a trusted indigenous time synchronization framework.

V. The initiative supports the vision of **Digital India**, **Aatmanirbhar Bharat**, and the development of resilient digital public infrastructure.

VI. It also strengthens India's National Time Scale and improves the reliability of time-sensitive digital services.

VII. The demonstration marks a major step towards nationwide deployment of a secure and indigenous precision timing network.

BACKGROUND / CONTEXT

Indian Standard Time (IST)

- India's official time standard.
- Based on **82°30' East longitude**, passing near **Mirzapur (Uttar Pradesh)**.
- **UTC +5:30** (5 hours 30 minutes ahead of Coordinated Universal Time).

White Rabbit (WR) Technology

I. An **Ethernet-based precision timing protocol** that combines:
   A. **Precision Time Protocol (PTP – IEEE 1588)**.
   B. **Synchronous Ethernet (SyncE)**.

II. Enables synchronization of clocks with **sub-nanosecond accuracy** over optical fibre networks.

III. Widely used in:
   A. Scientific research.
   B. Particle accelerators.
   C. Telecommunications.
   D. Power systems.
   E. Defence and aerospace.

National Physical Laboratory (NPL)

- India's custodian of the **Indian Standard Time**.
- Functions under the **Council of Scientific and Industrial Research (CSIR)**.
- Maintains the National Time Scale and calibration standards.

KEY HIGHLIGHTS

- **Initiative:** White Rabbit Technology-based IST Dissemination Demonstration Network.
- **Location:** Bengaluru.
- **Objective:** Disseminate highly accurate and secure Indian Standard Time across India.
- **Lead Institution:** National Physical Laboratory (NPL), under CSIR.
- **Technological Significance:** Enables sub-nanosecond time synchronization using optical fibre.
- **Strategic Significance:** Reduces dependence on foreign timing systems and strengthens national security.
- **Economic Significance:** Supports reliable digital financial transactions, telecom networks, and smart infrastructure.
- **Challenges:** Nationwide fibre connectivity, infrastructure costs, interoperability, and cybersecurity.
- **Way Forward:** Expand the network nationwide, integrate with critical infrastructure, strengthen indigenous timing capabilities, and promote adoption across industry and government sectors.

PRELIMS BOOSTER BOX

- **Indian Standard Time (IST):** India's official time standard based on **82°30' East longitude**; **UTC +5:30**.
- **Reference Meridian:** Passes near **Mirzapur, Uttar Pradesh**.
- **White Rabbit (WR) Technology:** High-precision time synchronization technology providing **sub-nanosecond accuracy** over optical fibre networks.
- **Precision Time Protocol (PTP): IEEE 1588** standard used for synchronizing clocks across computer networks.
- **Synchronous Ethernet (SyncE):** Technology that distributes precise frequency synchronization over Ethernet networks.

- **National Physical Laboratory (NPL):** India's national metrology institute under **CSIR**, responsible for maintaining the **Indian Standard Time**.
- **CSIR (Council of Scientific and Industrial Research):** Established in **1942**; one of India's largest publicly funded R&D organizations.
- **Coordinated Universal Time (UTC):** International reference time standard used worldwide.
- **Metrology:** The science of measurement, including standards of time, length, mass, and other physical quantities.
- **Applications of Precision Timing:** Telecommunications, stock exchanges, power grid synchronization, satellite navigation, defence systems, and scientific research.

PadhAI-GENERATED UPSC MCQ

Consider the following statements:

1. **Indian Standard Time (IST)** is based on the **82°30′ East longitude** and is **UTC +5:30**.
2. **White Rabbit Technology** enables **sub-nanosecond precision time synchronization** over optical fibre networks.
3. The **National Physical Laboratory (NPL)**, under **CSIR**, is the custodian of India's **National Time Scale**.

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: (d)