Samudrayaan Mission

***Prelims**: Current events of national and international importance*

Why in news?

Recently the National Institute of Ocean Technology (NIOT) announced that, Samudrayaan, mission which is slated for launch by the end of 2026.

- **Samudrayaan** – It is the India's first ***manned ocean mission*** using *self-propelled manned submersible Matsya-6000* to a depth of 6,000 meters.
- The mission is part of India's **Deep Ocean Mission**, a flagship initiative to explore and harness deep-sea resources.
- **Implementation** - It is implemented by the ***National Institute of Ocean Technology (NIOT), Chennai***, under the ***Ministry of Earth Sciences (MoES)***.
- **Key Objectives –** To explore India's ***Exclusive Economic Zone (EEZ)*** *and* ***continental shelf*** for:
  - Polymetallic nodules
  - Gas hydrates
  - Cobalt-rich ferromanganese crusts
  - Deep-sea biodiversity
- To strengthen India's presence in the ***blue economy*** and oceanic research.
- To develop a ***manned submersible*** capable of diving to a depth of 6,000 meters.

Matsya-6000

- It is the ***indigenously developed submersible*** that is a specialized underwater vehicle designed to explore and conduct research in the deepest parts of the ocean.
- It is named after the fish incarnation of Lord Vishnu—**Matsya**.
- It is designed to carry ***3 humans*** to a depth of ***6,000 meters (6 km)***.
- It is made of ***Titanium alloy*** to withstand the extreme pressures (up to 720 bar) encountered at 6,000 m depth.
- **Developed by** - ISRO
- **Operational endurance:**
  - ***12 hours*** of continuous mission capability
  - ***96 hours*** emergency survival capacity
  - ***Buoyancy and Ballast systems*** for submergence and resurfacing.
- **Key features:**
  - Manoeuvring propellers for navigation.
  - Power and control systems with onboard battery storage.
  - Subsea intervention manipulators for sample collection.
  - Communication systems by Ethernet and acoustic communication.
  - Navigation and positioning devices.

    - Safety systems for emergency support.
- **Strategic Importance** – It enhances India’s ***technological self-reliance*** in marine exploration.
- It supports India's commitment to sustainable ocean resource use.
- It strengthens India’s capabilities in,
    - Resource extraction
    - Scientific research
    - Environmental conservation

Reference

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