Year-End Review-2022: Department of Space

Prelims: ISRO, Chandrayaan-2 Mission, 50th PSLV Launch, One Web, Launch Vehicle Mark 3, IAD, Atma Nirbharta, UNNATI, Young Scientist Programme.

Mains: Key achievements of the Department of Space.

Why in News?

Recently, the **Year-End-Review of the Department of Space for the year 2022** under the Ministry of Science and Technology was released.

What are the Key achievements of the Department of Space?

- **Key Missions:** Altogether 44 spacecraft missions, 42 launch vehicle missions and 5 technology demonstrators, have been successfully realized, since 2014.
    - **Chandrayaan-2 Mission:** In 2019, **Chandrayaan-2 was successfully launched.**
        - It is **providing valuable science data for the research community.**
    - **50th PSLV Launch:**
        - The launch of PSLV-C48/ RISAT-2BR1 in Dec 2019 marked the **50th launch of PSLV**, the workhorse launch vehicle.
        - RISAT-2BR1 will keep a check on infiltration by allowing round-the-clock surveillance across the border.
    - **ISRO System for Safe & Sustained Operations Management (IS4OM):**
        - In July 2022, the Ministry of science dedicated **ISRO System for Safe & Sustained Operations Management (IS4OM)** to the nation in.
        - It is a facility that is conceived with a holistic approach towards ensuring safety and sustainability while reaping the **benefits of sustainable utilization of outer space for national development.**
    - **Launch Vehicle Mark (LVM) 3:**
        - LVM3 /OneWeb India-1 Mission was **successfully accomplished in October 2022.**
        - With this launch, LVM3 exemplifies **Atmanirbharata and enhances India's competitive edge in the global commercial launch** service market.
    - **Integrated Main Parachute Airdrop Test (IMAT):**
        - As part of **Gaganyaan programme,** IMAT of crew module deceleration system was successfully carried out at **Babina Field Fire Range (BFFR), Jhansi, Uttar Pradesh** in November 2022.
    - **Inflatable Aerodynamic Decelerator:**
        - **Indian Space Research Organisation (ISRO)** successfully demonstrated new technology with Inflatable Aerodynamic Decelerator (IAD) – a game changer with multiple applications for future missions.
        - The IAD has **huge potential in a variety of space applications like recovery of spent stages of rocket,** for landing payloads on to Mars or Venus and in making space habitat for human space flight missions.

- **PSLV-C54:**
  - **PSLV-C54 successfully launched** EOS-06 satellite in November 2022 along with **Eight Nano-satellites including INDIA-BHUTAN SAT (INS-2B).**
  - The launch of the new satellite is part of India's efforts to back Bhutanese King Jigme Khesar Namgyel Wangchuck's plans to use advanced technology, including ICT and space technology, for the development of Bhutan.

- **Academic Support, Capacity building and Outreach:**
  - **Space Technology Incubation Centers (STIC):**
    - In order to boost the space research activities, STIC have been established, since 2018.
    - Under this initiative, **nine Space Technology Cells (STC), Six STIC and Six Regional Academic Centre for Space (RACS) are operational.**
  - **Satish Dhawan Centre for Space Sciences:**
    - Recently, Satish Dhawan Centre for Space Sciences was jointly established by ISRO/DoS and Central University of Jammu.
  - **Unispace Nanosatellite Assembly & Training by ISRO:**
    - In June 2018, India announced a capacity building training programme **UNNATI (UNispace Nanosatellite Assembly & Training by ISRO)** on Nanosatellites development through a combination of theoretical coursework and hands-on training on **Assembly, Integration and Testing (AIT).**
  - **Young Scientist Programme:**
    - In 2019, ISRO launched an annual special programme called "Young Scientist Programme" or the **"Yuva VIgyani KAryakram" (YUVIKA)** in line with the Government's vision **"Jai Vigyan, Jai Anusandhan".**
    - The Program is primarily aimed at imparting basic knowledge on Space Technology, Space Science and Space Applications **to the young talents with the intent of encouraging them in the fascinating domain of outer space.**
  - **SpaceTech Innovation Network (SpIN):**
    - ISRO and Social Alpha signed an MoU in December 2022 to launch SpaceTech Innovation Network (SpIN), India's first **dedicated platform for innovation curation and venture development** for the burgeoning space entrepreneurial ecosystem.

- **Reforms and Enhanced Participation of Industries:**
  - **NewSpace India Limited (NSIL):**
    - In 2019, the NSIL got incorporated as a **wholly owned Government of India Undertaking**/ Central Public Sector Enterprise (CPSE).
    - It was aimed at enabling **Indian Industries to scale up high-technology manufacturing base for space programme** and to commercially exploit the products and services emanating from the Indian Space Programme for meeting the domestic and global customer needs.
    - **GSAT-24 communication satellite** which is the first demand driven mission of NSIL was launched from Kourou, French Guiana, in June 2022.
  - **IN-SPACe:**
    - IN-SPACe was launched to provide a level playing field for private companies to use Indian space infrastructure.
    - It acts as a single-point interface between ISRO, and everyone who wants to participate in space-related activities or use India's space resources.
  - **Indian Space Association (ISpA):**
    - ISpA aspires to be the collective voice of the Indian Space industry. ISpA will be represented by leading domestic and global corporations that have advanced capabilities in space and satellite technologies.
  - **First Private Launchpad & Mission Control Center:**
    - First private launchpad & mission control center established by M/s Agnikul Cosmos Pvt. Ltd., Chennai in ISRO campus at SDSC, SHAR in November 2022.
  - **Indian Space Policy – 2022:**
    - Indian Space Policy – 2022 policy is cleared by the Space Commission. The Policy has undergone extensive deliberations with industry groups, inter-ministerial consultations, has been reviewed by Empowered Technology Group and is under further approval process.

- **Disaster Management:**
  - **Monitoring flood inundation**, generation of flood hazard zonation atlases of flood prone states, developing flood early warning models, multiple daily detections & dissemination of active forest fires, forecasting cyclone track; intensity & landfall, **damage assessment due to earthquakes and landslides, etc. were carried out.**
- **Covid-19 Related Supports:**
  - During the Covid-19 pandemic period, devices like **Mechanical Ventilator & Medical Oxygen Concentrator** were developed and the technologies are transferred to Indian industries.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims

Q.1 In the context of space technology, what is "Bhuvan", recently in the news? (2010)

(a) A mini satellite launched by ISRO for promoting the distance education in India
(b) The name given to the next Moon Impact Probe, for Chandrayaan-II
(c) A geoportal of ISRO with 3D imaging capabilities of India
(d) A space telescope developed by India

Ans: (c)

Q.2 Consider the following statements: (2016)

The Mangalyaan launched by ISRO

1. is also called the Mars Orbiter Mission
2. made India the second country to have a spacecraft orbit the Mars after USA
3. made India the only country to be successful in making its spacecraft orbit the Mars in its very first attempt

Which of the statements given above is/are correct?

(a) 1 only
(b) 2 and 3 only
(c) 1 and 3 only
(d) 1, 2 and 3

Ans: (c)

Mains

Q.1 What is India's plan to have its own space station and how will it benefit our space programme? **(2019)**

Q.2 Discuss India's achievements in the field of Space Science and Technology. How the application of this technology helped India in its socio-economic development? **(2016)**

Source: PIB