Tianwen-1: China's Mars Mission

Why in News

Recently, China's spacecraft **Tianwen-1** landed on Mars carrying its **first Mars rover** named **Zhurong.**

- It became the **third country** to land on Mars **after the US and Soviet Union.**
- **China's previous 'Yinghuo-1' Mars mission**, which was supported by a Russian spacecraft, **had failed** after it did not leave the earth's orbit and disintegrated over the Pacific Ocean **in 2012.**

Key Points

- **About the Tianwen-1 Mission:**
  - **Launch:**
    - The **Tianwen-1 Spacecraft** was **lifted off on a** Long March 5 rocket, from the Wenchang launch center in **July 2020.**
  - **Three Parts:**
    - The Spacecraft consists of three parts - the **orbiter, the lander and the rover** - which separated in Mars orbit.
    - The **orbiter will remain in the orbit for scientific operations** and to relay signals while the **lander-rover combination has made an autonomous descent and landing.**
      - The **lander from Tianwen-1 has touched down on Utopia Planitia**, a large plain in the northern hemisphere of Mars.
  - **Objectives:**
    - To conduct scientific investigations into the planet's soil, geological structure, environment, atmosphere and water.
      - The mission **will be the first to place a ground-penetrating radar** on the Martian surface, which will be able to study local geology, as well as rock, ice, and dirt distribution.
- **China's Other Space Programmes:**
  - **Chang'e-5** (Moon)
  - **Tianhe** (Permanent Space Station)
- **Other Mars Missions:**
  - **NASA's Perseverance Rover**
  - **UAE's Hope Mars Mission** (UAE's first-ever interplanetary mission)
  - **India's** Mars Orbiter Mission (MOM) or **Mangalyaan:**
    - It was launched from the Satish Dhawan Space Centre in Andhra Pradesh by **Indian Space Research Organisation** in November 2013.

- It was launched on board a PSLV C25 rocket with the aim of studying Martian surface and mineral composition as well as scan its atmosphere for methane (an indicator of life on Mars).

Mars

- **Size and Distance:**
    - It is the **fourth planet from the Sun** and the **second-smallest** planet in the Solar System.
    - Mars is about **half the size of Earth.**
- **Similarity to the Earth (Orbit and Rotation):**
    - As Mars orbits the Sun, it completes **one rotation every 24.6 hours**, which is very similar to one day on **Earth (23.9 hours).**
    - Mars' axis of rotation is **tilted 25 degrees** with respect to the plane of its orbit around the Sun. This is similar to **Earth**, which has **an axial tilt of 23.4 degrees.**
    - Mars has distinct seasons like Earth, but **they last longer than seasons on Earth.**
        - **Martian days** are **called sols**—short for **'solar day'.**
- **Other Features:**
- The **reason** Mars **looks reddish** is due to oxidation or rusting of iron in the rocks, and dust of Mars. Hence it is also called the **Red Planet.**
- It has the **largest volcano** in the solar system i.e. **Olympus Mons.**
- It has **two small moons, Phobos and Deimos.**

Source: TH