Red Planet Day

Why in News?

28th November is marked as Red Planet Day commemorating the day when **National Aeronautics and Space Administration (NASA)** mission Mariner 4 was launched in 1964.

- Mariner 4 captured significant information on, and photographs of, Mars for the first time.

What are the Key Points Related to 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.**

What are the Various Mars Missions?

- NASA has a lander (Mars Insight), two rovers (Curiosity and Perseverance), and three orbiters (Mars Reconnaissance Orbiter, Mars Odyssey, MAVEN)
- **ExoMars rover (2021) (European Space Agency)**
- **Tianwen-1: China's Mars Mission (2021)**
- **UAE's Hope Mars Mission (UAE's first-ever interplanetary mission) (2021)**
- **India's Mars Orbiter Mission (MOM) or Mangalyaan (2013)**
- **Mars 2 and Mars 3 (1971) (Soviet Union)**

UPSC Civil Services Examination Previous Year Questions (PYQs)

Q1. "The experiment will employ a trio of spacecraft flying in formation in the shape of an equilateral triangle that has sides one million kilometres long, with lasers shining between the craft." The experiment in question refers to (2020)

(a) Voyager-2
(b) New Horizons
(c) LISA Pathfinder
(d) Evolved LISA

Ans: (d)

Exp:

- Evolved Laser Interferometer Space Antenna (eLISA) is a spectacular plan of setting into space three spacecrafts, a mother and two daughter spacecrafts, which will fly in a triangular formation, trailing the earth in its orbit around the sun at a distance of over 50 million km. Each arm of the imaginary triangle, from the mother to each daughter spacecraft, will measure about a million km.
- eLISA seeks to measure gravitational waves in the frequency range from 0.1 mHz to about 100 mHz. To achieve this, it is necessary for the interferometers to have an arm length of a million kilometres and that is impossible to achieve with an earth based setup.
- **Hence, option D is the correct answer.**

Q2. 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)

Exp:

- Mangalyaan, launched by ISRO to study maritian surface and atmosphere, is also called Mars OrbiterMission. It is India's first interplanetary mission. **Hence, statement 1 is correct.**
- It has been configured to carry out observation of physical features of Mars and carry out a limited study of the Martian atmosphere with following five payloads:
    - Mars Colour Camera (MCC)
    - Thermal Infrared Imaging Spectrometer (TIS)
    - Methane Sensor for Mars (MSM)
    - Mars Exospheric Neutral Composition Analyser (MENCA)
    - Lyman Alpha Photometer (LAP)
- India is the only 4^{th} country after the USA, Russia and Europe to have a spacecraft orbiting the Mars. **Hence, statement 2 is not correct.**
- India is the only country to successfully make its spacecraft enter Mars orbit in a single attempt. **Hence, statement 3 is correct.**
- **Therefore, option (c) is the correct answer.**

Source: IE