**Syllabus subtopic:** Achievements of Indians in Science & Technology; Indigenization of Technology and Developing New Technology.

**Prelims and Mains focus:** about Vyommitra and the functions it can perform; its significance; about Gaganyaan

**News:** The ISRO unveiled its first ‘woman’ astronaut, named Vyommitra, to an international gathering in Bengaluru on Wednesday.

**About Vyommitra**

- Vyommitra *(vyoma-space, mitra-friend)* the prototype of the half-humanoid, made for the first unmanned Gaganyaan mission.

- The **artificial intelligence-based robotic system** is being developed at a robotics lab at the VSSC in Thiruvananthapuram for an unmanned flight of ISRO’s GSLV III rocket in December 2020, which, along with a second unmanned flight in July 2021, will serve as the test of ISRO’s preparedness for its **maiden manned space mission, Gaganyaan**, being targeted for 2022 to mark 75 years of India’s independence.

- Vyommitra, equipped with a head, two arms and a torso, is built to **mimic crew activity inside the crew module of Gaganyaan**. It will have a human-like face, with lips synchronised for movement to mimic speech.

- Once it is fully developed, Vyommitra will be able to use equipment on board the spacecraft’s crew module, like safety mechanisms and switches, as well as receive and act on commands sent from ground stations.

**Functions it can perform**

- It can monitor through module parameters, alert crew members and perform life support operations.
• It can perform activities like switch panel operations. It can also be a companion and converse with the astronauts, recognise them and respond to their queries.

• Attaining launch and orbital postures, responding to the environment, generating warnings, replacing carbon dioxide canisters, operating switches, monitoring of the crew module, receiving voice commands, responding via speech (bilingual),” are among its functions listed.

Significance

• The unmanned test flight with a humanoid will be the first human rated flight of the GSLV Mk III.

• With ISRO set to be the first to attempt to send a manned mission to space without carrying out tests with animals, the flight with Vyommitra will serve as a test of the capabilities of the rocket system to take a human to space and back. Among the key parameters that will be tested is the efficacy of the crew module where astronauts will fly, whether its environment is conducive for human flight, and the safety factor.

Is this the first time ISRO is deploying a robotic system?

No. ISRO has used robotic and autonomous system for many of its missions, including the recent Chandrayaan-2 mission where the Vikram lander was functioning in autonomous mode — using data stored in its systems — while attempting to make a soft landing on the moon’s surface.