Vyommitra: A Half-humanoid

Why in News?

Vyommitra, a half-humanoid is being developed by the Indian Space Research Organisation (ISRO) for an unmanned space mission later in 2020.

Who is Vyommitra?

- ISRO's Vyommitra (vyoma = space, mitra = friend) is the prototype for a "half-humanoid".
- She is also being called a half-humanoid since she will only have a head, two hands and a torso, and will not have lower limbs.
- She is under development at a robotics laboratory at the Vikram Sarabhai Space Centre.
- She will fly to space on an unmanned mission later this year, aiming to lay the ground for ISRO's manned mission Gaganyaan in 2022.

What is a half-humanoid?

- A humanoid is basically a robot with the appearance of a human being.
- Like any robot, a humanoid's functions are determined by the computer systems to which it is connected.
- With the growth of artificial intelligence and robotics, humanoids are being increasingly used for repetitive jobs.
- The artificial intelligence technologies are used in a humanoid to perform simple functions that include walking, moving things, communicating and obeying commands.

Why is ISRO developing a humanoid?

- ISRO plans to send a human into space for the first time by 2022.
- It is racing against time to develop a crew module and rocket systems that will ensure the safe travel and return of the Indian astronaut.
- Other countries that have successfully launched humans into space did so after having used animals for conducting tests of their rockets and crew recovery systems.
- ISRO will use the humanoid to test the efficacy of its GSLV Mk III rocket to transport a human to space and back.

What are all under development?

- **GSLV Mk III rocket** is undergoing improvisation to ensure that it is human-rated or declared safe to transport a human being to space.
- Its first unmanned mission with the human-rated rocket is planned for December 2020.
- The **crew module system**, too, is under development, and ISRO will attempt to carry out several tests over the next few months to launch and recover the module using new test launch rockets.
- ISRO has considerable experience in building **robotic systems** for its space projects.
- Once flown into space, ISRO's half-humanoid will be able to test systems in the crew module meant for the survival and safe travel of the first Indian astronaut in 2022.

What are the tasks that Vyommitra will perform in space?

- The Vyommitra humanoid will test the ground for the human spaceflight.
- Once fully developed for the unmanned flight, she will be able to perform activities which will include,
    1. Procedures to use equipment on board the spacecraft's crew module such as safety mechanisms and switches,
    2. Receiving and acting on commands sent from ground stations.
- The functions listed for the humanoid include attaining launch and orbital postures, responding to the environment, generating warnings, replacing CO2 canisters, monitoring the crew module, etc.
- Vyommitra will have lip movement synchronised to mimic speech.
- She can also double up as an artificial buddy to an astronaut - providing audio inputs on aspects like the health of the spacecraft during the launch, landing and orbital phases of the manned mission.
- She will report back to Earth on the changes occurring in the crew module during the spaceflight and return.
- This willl enable ISRO to understand the safety levels required in the crew module that will eventually fly a human being.

Source: Indian Express



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