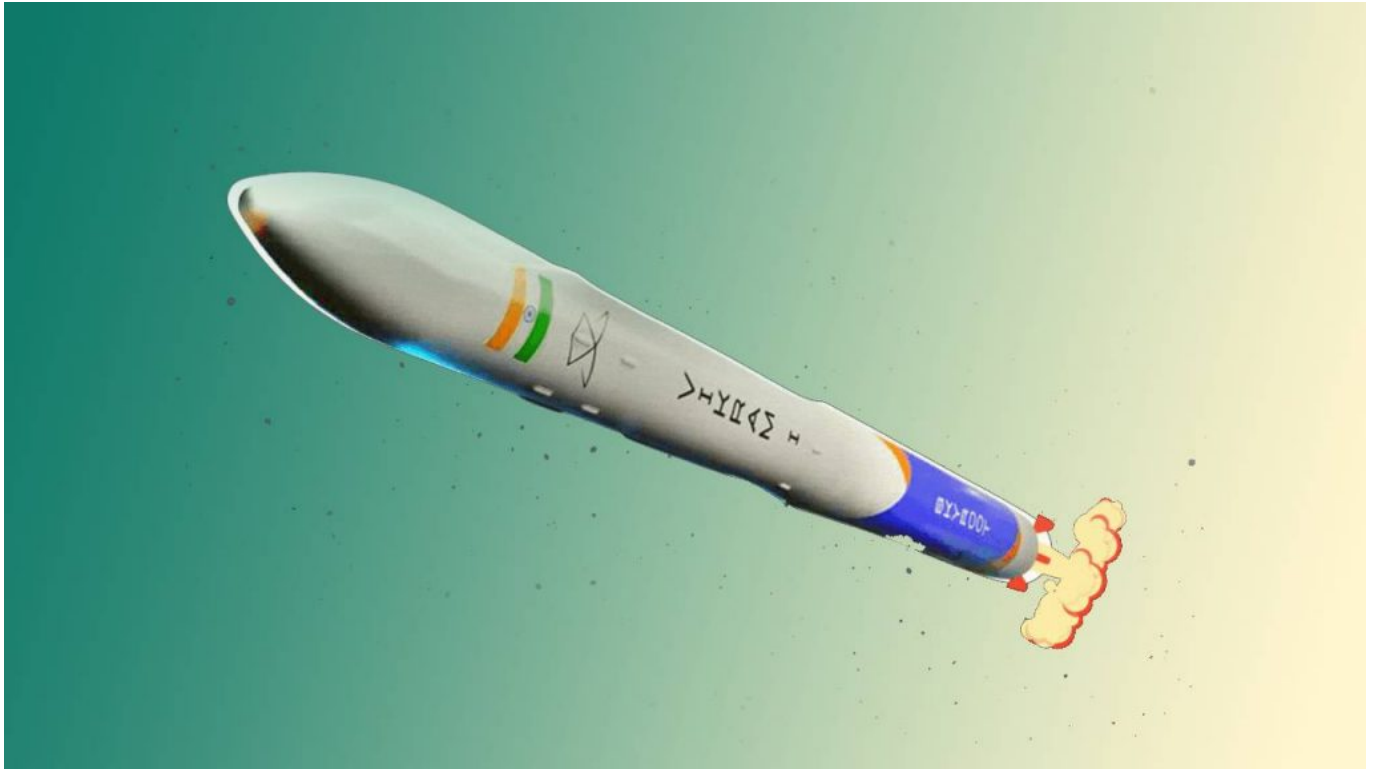


Rocket Vikram-S

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Topic- Space Technology [GS Paper-3]

Context- Space technology startup Skyroot Aerospace is set to make history by sending India's first privately developed rocket Vikram-S into space between 12th and 16th November, 2022 under the 'Prarambh' Mission.

Key Highlights

- Vikram S, developed by Hyderabad-based space startup Skyroot Aerospace has announced that the launch in a sub-orbital mission will be carried out with three payloads.
- The maiden mission of Skyroot Aerospace, named 'Prarambh' will carry two Indian and one foreign customer payloads and is set for launch from the Indian Space Research Organisation's launchpad at Sriharikota.

Vikram-S

- The Vikram-S rocket is a single stage suborbital launch vehicle which is designed to carry three customer payloads.
- The rocket would help test and validate the majority of the technologies in the Vikram series of space launch vehicles.
- The 'Vikram' series has in total three rockets that are being developed to launch small satellites which will help to support communication services such as broadband internet, GPS, IoT from space and earth imaging.

- The Vikram series (I, II, III) comprises solid-state rockets that are built on upgradeable architecture with carbon composite and 3D-printed motors and can be assembled and launched in less than 72 hours.
- The Vikram-I can launch with 480 kilograms of payload, whereas the Vikram-II is designed to do so with 595 kilos and similarly Vikram-III has a 500 km Low Inclination Orbit launch capability with 815 kg.
- However Vikram I will be the first of the series launch that includes three solid fuel stages, plus a liquid-fueled kick stage.
- It has been enabled to carry lighter satellites, weighing up to 480 kg to low-inclination orbits.
- The Vikram-I launch vehicle will be powered by the Kalam-100 rocket, which successfully went through a static fire test.
- Vikram I is designed to have two Indian and one foreign payload.

Sub-orbital Mission

- Sub-orbital flights are the vehicles which are travelling slower than the orbital velocity meaning it is fast enough to reach outer space but not fast enough to stay in an orbit around the Earth.
- The spaceflight is when a spacecraft leaves the gravitational field from which it was launched and travels through space on a trajectory that crosses the atmosphere or surface of that body.
- In this case, the spaceflight is unable to complete revolving an orbit.
- These missions are aimed at lower altitudes than an orbit.
- These are considered decisive as experimentation before the launch of a spacecraft in an actual orbit.

Prarambh Mission

- The Prarambh mission will be launched from Sriharikota to an altitude of 120 kilometers above the surface of Earth, officially crossing the Karmen line where space begins.
- The mission is aimed at carrying three payloads into space, including a 2.5-kilogram payload that has been developed by students from several countries.
- The Prarambh mission along with the Vikram-S rocket were developed by the Hyderabad-based startup with extensive support from Indian Space Research Organisation (ISRO) and IN-SPACE (Indian National Space Promotion and Authorisation Centre).