GS-III: Successful Launch of Chandrayan 2.

Context

- The 640-tonne GSLV Mk-III rocket successfully injected the 3,850-kg Chandrayaan-2 composite module into the Earth’s orbit.
- With the successful launch all eyes are now on September 7 when the lander and rover modules of the spacecraft will make a soft landing on the surface of the moon.

Chandrayaan-2: India’s first lander mission

- Chandrayaan-2 consists of an Orbiter, Lander and Rover, all equipped with scientific instruments to study the moon.
- The Orbiter would once again watch the moon from a 100-km orbit, while the Lander and Rover modules will separate and make a soft-landing on moon’s surface.
- ISRO has named the Lander module as Vikram, after Vikram Sarabhai, the pioneer of India’s space programme, and the Rover module as Pragyaan, meaning wisdom.
- Once on the moon, the rover, a six-wheeled solar-powered vehicle, will detach itself from the lander, and would slowly crawl on the surface, making observations and collecting data.

Tasks to be accomplished

- The mission will be equipped with two instruments, and its primary objective would be to study the composition of the moon’s surface near the landing site, and determine its abundance of different elements.
- One of the instruments will also look out for seismic activity on lunar surface.
- While the lander and rover are designed to work for only 14 days (1 lunar day), the Orbiter, a 2379-kg spacecraft with seven instruments on board, would remain in orbit for a year.
- It is equipped with different kinds of cameras to take high-resolution 3D maps of the surface.
- It also has instruments to study the mineral composition on the moon and the lunar atmosphere, and also to assess the abundance of water.

Chandrayaan-2 to enter uncharted territory

- With Chandrayaan-2, India will become only the fourth country in the world to land a spacecraft on the moon.
- So far, all landings human as well as non-human, on the moon have been in areas close to its equator.
- That was mainly because this area receives more sunlight that is required by the solar-powered instruments to function.
- Earlier this year, in January, China landed a lander and rover on the far side of the moon, the side that is not facing the earth. This was the first time that any landing had taken place on that side.

What differentiates Chandrayaan 2 with others?

- Chandrayaan-2 will make a landing at a site where no earlier mission has gone, near the
South pole of the moon.

- It is a completely unexplored territory and therefore offers great scientific opportunity for the mission to see and discover something new.
- Incidentally, the crash-landing of the MIP from the Chandrayaan-1 mission had also happened in the same region.
- The south pole of the moon holds the possibility of the presence of water, and this is one aspect that would be probed meticulously by Chandrayaan-2.
- In addition, this area is also supposed to have ancient rocks and craters that can offer indications of history of moon, and also contain clues to the fossil records of early solar system.