

## **4. Chandrayaan-2 and the Approaching Lunar night**

**Prelims Tag:** Space Technology

**Mains Tag:** GS-III: Achievements of Indians in science & technology, Awareness in the fields of Space.

### **Why in News:**

- ▶▶ The failure of soft landing of the lander Vikram of Chandrayaan-2 mission and the follow up efforts by ISRO to retrieve the lander is about to yield no results as lunar night is about to approach.

### **About:**

- ▶▶ India's Geosynchronous Satellite Launch Vehicle, GSLV MkIII-M1 successfully launched the 3,840-kg Chandrayaan-2 spacecraft into the Earth's orbit on July 22. The spacecraft successfully entered the lunar orbit on August 20 by performing Lunar Orbit Insertion (LOI) manoeuvre, and on September 2, 'Vikram' successfully separated from the orbiter.
- ▶▶ But Lander Vikram, with rover Pragyan housed inside it, lost communication with the ground station during its final descent, just 2.1 kms above the lunar surface, minutes before the planned touch-down on the Moon.
- ▶▶ Since then ISRO has been trying to establish contact with the lander, though the hopes kept fading with the lunar night phase approaching.

### **Why we can't retrieve Vikram During Lunar Night:**

- ▶▶ The lander, designed to execute a soft-landing on the lunar surface, and rover have a mission life of one Lunar day, which is equivalent to 14 earth days that ends Saturday.
- ▶▶ ISRO has said once the Lunar night falls, there would be no sunlight for the lander to generate power for its working and also it was not designed to operate in the heavy cold temperature of Moon during the phase.

### **About Lunar Night:**

- ▶▶ A lunar day is the period of time for Earth's Moon to complete one rotation on its axis with respect to the Sun. Due to tidal locking, it is also the time the Moon takes to complete one orbit around Earth and return to the same phase.
- ▶▶ A lunar month is the period between two new moons. A lunar month lasts about 29.5 solar days on earth.
- ▶▶ The average lunar month is 27.3 earth days so half that, the lunar day is on average 13.65 earth days long and so is the Lunar night approximately.

### About Chandrayaan-2 Mission:

- ▶▶ Chandrayaan-2 was launched using a Geosynchronous Satellite Launch Vehicle Mk III (GSLV-F10).
- ▶▶ The spacecraft (orbiter) weighs around 3,290 kg and it will orbit around Moon and perform objectives of remote sensing the Moon.
- ▶▶ It has been developed indigenously by ISRO. It consists of Orbiter, Lander (**Vikram**) and Rover (**Pragyan**) configuration. In this mission, ISRO has attempted for the first time to land a rover on moon's south pole.

