India's heaviest satellite GSAT-11

5th December, 2018

What to study?

- **For Prelims: All about GSAT- 11,**
- **For Mains: India's space odyssey, Significance and applications of GSAT-11, technological achievements.**

Context: India's heaviest and most advanced satellite GSAT-11 was recently launched from the Guiana Space Centre at Kourou in French Guiana.

GSAT- 11- key facts:

GSAT-11 is **ISRO's heaviest satellite** ever built and weighs about 5854 kilograms.

- It was launched onboard **Ariane-5 launch vehicle from French Guiana**.
- ISRO has revealed that the satellite will be initially placed in the Geosynchronous Transfer Orbit and will be later raised to Geostationary Orbit. It will be using the Liquid Apogee Motor which will be onboard the satellite.
- GSAT-11 is part of ISRO's new family of **high-throughput communication satellite (HTS) fleet** that will drive the country's Internet broadband from space to untouched areas.
- According to ISRO, GSAT-11's multiple spot beam coverage — 32 in Ku band and eight in Ka bands — will deliver an improved service of 16 gbps over the Indian region and nearby islands.
- The satellite will also have VSAT Terminals which basically will ensure that it can handle large capacity platform to support a huge subscriber base.

GSAT 11: How does it work?

GSAT-11 will use **a 'multi-spot' approach** to maximize its coverage area in the Indian mainland and islands — a far superior communication technology than existing INSATs and GSATs.

- In a first for a satellite built by ISRO, GSAT-11 will carry a next-generation I-6K bus (communication satellite hub) to provide services in two widely-used wavelengths for telecommunications: the Ku- and Ka-bands. This makes GSAT-11 three to six times more powerful than any of ISRO's (and India's) satellite roster today.
- It will provide up to 14 Gigabit/s in both voice and video broadband services anywhere in the Indian mainland or islands over its 15-year lifespan, according to ISRO.
- The satellite has 32 Ku-band transponders and 8 Ka-band hubs on board. The Ku- and Ka-bands are different frequencies of microwaves in the electromagnetic spectrum.

GSAT 11: Why is it important?

- GSAT-11 will bring far greater speeds (16 Gbps of it, no less) and capacity to meet growing demand for mobile and internet in households, businesses, and public organisations.
- Large parts of rural areas still remain untouched by the scope of commercial telecom today — something GSAT-11 is designed to change. Under Digital India's BharatNet project GSAT-11 will boost access to voice and video streaming in most, if not all, of rural India.
- With India moving fast towards implementing 'Smart Villages and Cities', they can be efficiently linked through a large communication satellite.

Mains Question: Highlight the achievements of ISRO as a pioneer in space technology?

To be looked in UPSC Paper 3 Topic :

1. Achievements of Indians in science & technology; indigenization of technology and developing new technology.
2. Indigenization of technology and developing new technology.
3. Awareness in space.