## GAGAN

January 6, 2021 What is GAGAN?

- GAGAN is an acronym for GPS Aided GEO Augmented Navigation.
- It is a Space Based Augmentation System (SBAS) jointly developed by ISRO and AAI to provide the best possible navigational services over Indian FIR (Flight Information Region) with the capability of expanding to neighbouring FIRs.
- It will serve as a low cost substitute to GPS service over India, Bay of Bengal, South-east Asia and Middle East along with expansion up to Africa.
- GAGAN is a system of satellites and ground stations that provide GPS signal corrections, giving you better position accuracy.
- GPS alone does not meet the ICAOs navigational requirements for accuracy, integrity and availability. GAGAN corrects for GPS signal errors caused by Ionospheric disturbances, timing and satellite orbit errors and also it provides vital information regarding the health of each satellite.
- One essential component of the GAGAN project is the study of the ionospheric behaviour over the Indian region.

## Services Offered by GAGAN:

- It is **primarily being used in the aviation sector** for precise position information Services.
- And others services include Forest management, Railways signalling, Scientific Research for Atmospheric Studies, Natural Resource and Land Management, Location based services, Mobile, Tourism.

How does it work?

- GAGAN consists of a set of ground reference stations positioned across various locations in India called Indian Reference Station (INRES), which gathers GPS satellite data.
- A master station, Indian Master Control Centre (INMCC) collects data from reference stations and creates GPS correction messages.
- The corrected differential messages are up linked via Indian Uplink Station (INLUS) and then broadcasted on a signal from three geostationary satellites (GSAT-8, GSAT-10 and GSAT-15).
- The information on this signal is compatible with basic GPS signal structure, which means any SBAS enabled GPS receiver can read this signal.