**6 th SEMESTER (MAJOR)**

**PAPER 604: PRINCIPLES AND APPLICATION OF REMOTE SENSING, GIS AND GPS**

**UNIT 3: GLOBAL POSITIONING SYSTEM**

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**Global Positioning System (GPS): Concept**

**Introduction**: The GPS is a satellite-based navigation system made up of a network of 24 satellites placed into orbit by the U.S. Department of Defense. GPS was originally intended for military applications, but in the 1980s, the government made the system available for civilian use. GPS works in any weather conditions, anywhere in the world, 24 hours a day. There are no subscription fees or setup charges to use GPS.

**Concept of GPS:**

The global positioning system is a satellite-based navigation system consisting of a network of 24 orbiting satellites that are eleven thousand nautical miles in space and in six different orbital paths. The satellites are constantly moving, making two complete orbits around the Earth in 24 hours i.e. 2.6 kilometers per second.

• The Global Positioning System (GPS), originally NAVSTAR GPS, is a satellite-based radio navigation system owned by the United States government and operated by the United States Space Force (USSF). It is one of the Global Navigation Satellite Systems (GNSS) that provides geo location and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. Obstacles such as mountains and buildings block the relatively weak GPS signals.

• The Global Positioning System is a space-based navigation and positioning system that was designed by the U.S. Military to allow a single soldier or group of soldiers to autonomously determine their position to within 10 to 20 meters of truth. The concept of autonomy was important in that it was necessary to design a system that allowed the soldier to be able to determine where they were without any other radio (or otherwise) communications.

• The GPS project was started by the U.S. Department of Defense in 1973, with the first prototype spacecraft launched in 1978 and the full constellation of 24 satellites operational in 1993. Originally limited to use by the United States military, civilian use was allowed from the 1980s following an executive order from President Ronald Reagan. The system provides critical capabilities to military, civil and commercial users around the world. It is maintained by the United States government and is freely accessible to anyone with a GPS receiver.

**GPS Segments/ Components of GPS/ Principles of GPS**

The Global Positioning System consists of three major segments:

1. **The Space Segment:** The space segment is composed of the constellation of satellites as a whole that are currently in orbit, including operational, backup and inoperable units.
2. **The Control Segment:** Basically, the control segment maintains the integrity of both the satellites and the data that they transmit.
3. **The User Segment:** The user segment is simply all of the end users who have purchased any one of a variety of commercially available receivers. While the user segment obviously includes military users, this book will concentrate on the civilian uses only.

The space and control segments are operated by the United States Military and administered by the U.S. Space Command of the U.S. Air Force.

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