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SATELLITE INTERNET

This article covers "Daily Current Affairs" and the topic details "Satellite Internet". This topic has relevance in the "Science and Technology" section of the UPSC CSE exam.

For Prelims:

What is Satellite internet and its uses?

For Mains:

GS2: Science and Technology

Why in the news?

Recently, Reliance Jio made a significant announcement, showcasing **India's first satellite-powered gigabit internet service**. This breakthrough technology has the potential to deliver high-speed internet to remote and hard-to-reach regions within the country.

Satellite Internet

- Satellite internet technology is a form of internet access provided through communication satellites orbiting the Earth.
- It allows users to connect to the internet without relying on traditional terrestrial methods like cable or fibre optic connections.

Working of Satellite Internet

- An internet service provider (ISP) deploys satellites into orbit around the Earth.
- The ISP then relies on a signal transmitted through one of these satellites in either low-Earth or high-Earth orbit. A strategically placed receiver dish, situated with an unobstructed view of the sky, captures this signal.
- To establish a functional internet connection, a modem is connected to this receiver dish, translating the incoming signal.
- Traditional high-speed satellite internet methods often involve constellations of low-Earth orbit (LEO) satellites, which orbit the Earth at altitudes ranging from 250 to 2,000 kilometres.
- Communication between these satellites and the Earth takes place through the transmission of radio waves.

Advantages:

- **Global Coverage:** Satellite internet is not restricted by geographical barriers, making it an ideal solution for remote and rural areas where traditional broadband connections are unavailable.
- **High Speed:** While it may not match the speeds of fibre-optic or cable internet, satellite technology can deliver significantly faster internet than dial-up or DSL connections.
- **Quick Deployment:** Satellite internet can be deployed relatively quickly, making it a valuable solution in emergencies and for businesses in need of rapid connectivity.
- **Redundancy:** It can serve as a backup or redundant internet connection for businesses, ensuring connectivity even when terrestrial networks fail.

Challenges and Limitations:

- **Latency:** Due to the long distance data must travel between the Earth and satellites, satellite internet experiences higher latency than terrestrial connections, making it less suitable for time-sensitive applications like online gaming or Video conferencing.
- **Cost:** Satellite internet services are more expensive than traditional broadband, often involving equipment and installation costs.
- **Data Caps:** Many satellite internet plans come with data usage restrictions, which can be a limiting factor for heavy internet users.
- **Weather Interference:** Adverse weather conditions, such as heavy rain or snow, can disrupt satellite signals, leading to connectivity issues.

More about the news:

- At the recent India Mobile Congress, Reliance Jio unveiled its latest technological innovation, JioSpaceFiber.
- This advanced satellite internet technology, developed in partnership with SES, a Luxembourg-based satellite communications company, harnesses medium Earth orbit (MEO) satellites to provide internet connectivity.
- SES's O3v and o3b mPOWER networks form the foundation of this groundbreaking initiative, claiming to offer internet services comparable to traditional fibre connections from space.

Sources: Reliance Jio demonstrates its satellite-based gigabit internet in India | Technology News – The Indian Express

Q1. With reference to Satellite Internet Technology, consider the following statements:

1. It allows users to connect to the internet without relying on cable or fibre optic connections.
2. Communication between these satellites and the Earth takes place through the transmission of infra-red waves.

Which of the statements given above is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) None

Answer: (a)

Q2. Consider the following:

1. Global Coverage
2. Faster internet than broadband
3. Quick deployment
4. No effect of weather conditions

How many of the abovementioned are advantages of Satellite Internet ?

- (a) Only one
- (b) Only two
- (c) Only three
- (d) All four

Answer: (b)

Q3. Discuss the significance and challenges of satellite internet technology with reference to India's recent development in this field.

Gaurav Nikumbh