6G Technology

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Why is in news? India can steer 6G standardization & become a global exporter of such technologies: DST Secretary

Secretary Department of Science and Technology (DST) said that India with its' indigenous 5G technology in place, committed and dedicated team of researchers in academia, industry players and start-ups has an ecosystem to bring the country to a position of strength in terms of mobile network technologies, at the Indian Mobile Congress (IMC) on October 29, 2023.

About:

6G has been conceived as a far superior technology than 5G.

6G, or the sixth-generation telecom network, is the cell phone technology that **will provide internet speed of up to 1 terabyte (TB) per second with "ultra-low latency"**.

Latency is the time it takes for data to pass from one point on a network to another.

It will **ensure smooth machine-to-machine and machine-to-human interactions** and boost the development of virtual and augmented reality (VR/AR) and Artificial Intelligence (AI).

However, since the majority of 6G supporting communication devices will be battery-powered and can have a high carbon footprint, it will also need to be balanced with sustainability.

6G different from 5G – How?

Under the **5G technology**, the **average speed range lies between 40 to 1,100 Mbps**, potentially hitting maximum speeds of 10,000 Mbps through technologies such as millimetre-wave spectrum and beamforming.

According to the document, **6G will offer ultra-low latency with speeds up to 1 Tbps**.

Need for 6G:

The **primary focus** of 6G is to **support the 4th Industrial Revolution** by building a bridge between human, machine, and environmental nodes.

In addition to surpassing 5G, 6G will have a range of unique features to **establish next-generation wireless communication networks for linked devices** by using machine learning (ML) and artificial intelligence (AI).

This will **also benefit emerging technologies** like smart cities, driverless cars, virtual reality, and augmented reality, in addition to smartphone and mobile network users.

It will combine and correlate different technologies, like deep learning with big data analytics.

Bharat 6G Project:

India’s 6G project will be implemented in two phases, the **first one from 2023 to 2025** and the **second one from 2025 to 2030.**

The government has also **appointed an apex council** to oversee the project and focus on issues such as standardization, identification of the spectrum for 6G usage, create an ecosystem for devices and systems, and figure out finances for research and development, among other things.

A key focus of the council will be on new technologies such as Terahertz communication, radio interfaces, tactile internet, artificial intelligence for connected intelligence, new encoding methods and waveforms chipsets for 6G devices.

Phases:

In phase one, support will be provided to explorative ideas, risky pathways and proof-of-concept tests.

Ideas and concepts that show promise and potential for acceptance by the global peer community will be adequately supported to develop them to completion, establish their use cases and benefits, and create implementational IPs and testbeds leading to commercialisation as part of phase two.

Objective:

It aims to **enable India to become a leading global supplier** of intellectual property, products and solutions of affordable 6G telecom solutions and identify priority areas for 6G research based on India’s competitive advantages.