C-DOT's 14 Indigenous Quantum Products

Prelims: *Current events of national and international importance | Science & Technology.*

Why in News?

On its 43rd Foundation Day, C-DOT unveiled 14 indigenous quantum products in Quantum Key Distribution (QKD) and Post-Quantum Cryptography (PQC).

- **C-DoT –** Centre for Development of Telematics, under **DoT, Ministry of Communications**.
- **Objective –** To strengthen security of India's communication networks.

14 Indigenous Quantum Products

- **Quantum Key Distribution (QKD) Systems**
- **Q-AKSHAY CD –** A compact, fibre-based Quantum Key Distribution (QKD) system based on Coherent One Way (COW) and Differential Phase Shift (DPS) protocols in a compact 1U size.
    - It enables secure quantum key generation and distribution over fibre networks.
- **Q-AKSHAY MD –** A fibre-based QKD system based on the Measurement Device Independent (MDI) protocol, offering enhanced security against vulnerabilities associated with measurement devices.
    - It represents C-DOT's next-generation approach to secure quantum key distribution.
- **C-SPD –** A Single-Photon Detector, a critical sub-module used in quantum communication systems.

- **C-RD –** A wideband RF driver designed to drive intensity and phase modulators used in quantum communication systems.
    - It serves as a critical sub-module for enabling high-performance quantum communication applications.

- **Post-Quantum Cryptography (PQC) Encryptors & Devices**

- **Q-SETU –** A quantum-safe encryptor designed to secure Layer 3 communications with a throughput of up to 80 Mbps.
    - It incorporates National Institute of Standards and Technology (NIST) Post-Quantum Cryptography (PQC) algorithms to protect data against emerging quantum-era threats.

- **Q-MAHASETU –** A next-generation, commercial-grade quantum-safe encryptor supporting Layer 2/3 networks with throughput of up to 40 Gbps.

    - It uses NIST PQC algorithms to provide high-speed, quantum-resistant protection for enterprise and critical communication networks.

- **Q-VIKRAM –** A defence-grade quantum-safe encryptor providing up to 1 Gbps throughput for Layer 2/3 networks.

    - It incorporates NIST PQC algorithms to provide enhanced protection for sensitive and strategic communications.

- **Q-AMOGH –** A high-speed quantum-safe optical encryptor providing up to 200 Gbps throughput at Layer 1.

    - Based on NIST PQC algorithms, it is designed to secure high-capacity optical communication links against emerging quantum threats.

- **Q-DARSHAN –** A quantum-safe video IP phone incorporating NIST PQC algorithms to protect voice and video communications.

    - It brings quantum-safe security directly into IP-based communication systems.

- **Q-VACHAN –** A quantum-safe in-line node for IP phones using NIST PQC algorithms.

    - It can upgrade existing IP phones with quantum security.

- **Q-RAQSHAK –** A quantum-safe enterprise network solution designed to protect enterprise communications and network infrastructure.

    - It incorporates NIST PQC algorithms to provide protection against current and future cryptographic threats.

- **Q-VAAYU –** A quantum-safe wireless point-to-point network solution designed to secure wireless communication links.

    - It uses NIST PQC algorithms to provide quantum-resistant security for wireless connectivity.

- **Q-VAJRA1000 –** A quantum-safe access node designed to upgrade existing communication networks with quantum security.

    - It can support technologies such as GPON and wireless radios, enabling quantum-safe protection to be integrated into existing network infrastructure.

- **Q-PARAKRAM –** A defence-grade quantum-safe encryptor providing up to 1 Gbps throughput for Layer 2/3 networks.

    - It incorporates NIST PQC algorithms and other proprietary algorithms and is designed to provide robust quantum-resistant security for strategic and defence communications.

- **Significance -** C-DOT's indigenous products strengthen India's security ecosystem by ensuring self-reliance, quantum-era readiness, and industry enablement.

- These efforts support the objectives of the National Quantum Mission, Digital India, and Atmanirbhar Bharat.

Reference

PIB | C-DOT's 14 Indigenous Quantum Products

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