

# Army sets up new Quantum Computing Lab

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**In news-** Recently, the Army has set up a quantum computing laboratory and a centre for artificial intelligence (AI) at a military engineering institute in Madhya Pradesh's Mhow.

## **About the laboratory-**

- It has been established by the Army with support from the National Security Council Secretariat (NSCS) to spearhead research and training in this key developing field.
- Indian Army has also established an Artificial Intelligence (AI) Centre at the same institution with over 140 deployments in forwarding areas and active support of industry and academia.
- The two centres will carry out extensive research in developing transformative technologies for use by the armed forces.
- Training on cyber warfare is being imparted through a state-of-the-art cyber range and cyber security labs.

## **What is quantum computing?**

- A quantum computer is a machine that **performs calculations using the laws of quantum physics to solve problems that would be extremely difficult**, if not impossible, for classical, semiconductor-based computers that behave according to the laws of classical physics.
- **Quantum computers vary from discrete digital electronic computers** based on transistors (a semiconductor to reproduce, turn, and control electronic signals).
- For ordinary digital computing, the data must be encrypted in binary digits (bits), each in one of two definite states (0 or 1).

- A quantum computer can do something that no ordinary classical computer can match.
- A quantum computer doesn't use bits, but uses quantum bits or qubits. And these qubits are made out of quantum material and a qubit which can exist as both 1 and 0 simultaneously.
- This bizarre consequence of quantum mechanics is called a superposition state and is the key to the quantum computer's advantage over classical computers.