National Supercomputing Mission

For Prelims: Param Pravega, Supercomputer, National Supercomputing Mission, National Knowledge Network (NKN).

For Mains: National Supercomputing Mission, IT and Computers, Achievements of Indians in Science & Technology.

Why in News?

Recently, the **Indian Institute of Science (IISc) Bengaluru** installed the supercomputer **'Param Pravega'.** It has a **supercomputing capacity of 3.3 petaflops.**

- It has been installed under the government's **National Supercomputing Mission.**
- The National Supercomputing Mission is intended to **indigenise the development and manufacturing of powerful computers.**

What is a Supercomputer?

- A **supercomputer** is a computer that performs at or near the **currently highest operational rate for computers.**
- Generally, **PETAFLOP** is a measure of a **Supercomputer's processing speed** and can be expressed as a **thousand trillion floating point operations per second.**
    - **FLOPS (floating point operations per second)** are typically used to measure the performance of a computer's processor.
    - Using floating-point encoding, extremely long numbers can be handled relatively easily.
- Supercomputers are primarily designed to be used in enterprises and organizations that **require massive computing power.**
    - For example: **weather forecasting, scientific research, intelligence gathering and analysis, data mining** etc.
- Globally, **China has the maximum number of supercomputers** and maintains the top position in the world, followed by the US, Japan, France, Germany, Netherlands, Ireland and the United Kingdom.
- India's **first supercomputer was PARAM 8000.**
- **PARAM Shivay, the first supercomputer assembled indigenously,** was installed in IIT (BHU), followed by **PARAM Shakti, PARAM Brahma, PARAM Yukti, PARAM Sanganak** at IIT-Kharagpur, IISER, Pune, JNCASR, Bengaluru and IIT Kanpur respectively.
- In 2020, **PARAM Siddhi**, the High-Performance Computing-Artificial Intelligence (HPC-AI) supercomputer, achieved **global ranking of 62nd in Top 500 most powerful supercomputer systems in the world.**

What is the National Supercomputing Mission?

- **In 2015, the National Supercomputing Mission was launched** to enhance the research capacities and capabilities in the country by connecting them to form a Supercomputing grid, with

National Knowledge Network (NKN) as the backbone.
    - The NKN project is aimed at establishing a strong and robust Indian network which will be capable of providing secure and reliable connectivity.
  - It supports the government's vision of **'Digital India'** and **'Make in India'** initiatives.
  - The Mission is being jointly steered by the **Department of Science and Technology (DST)** and the **Ministry of Electronics and Information Technology (MeitY).**
    - It is **implemented by** the Centre for Development of Advanced Computing (C-DAC), Pune, and the IISc, Bengaluru.
  - The mission was planned in **three phases:**
    - **Phase I** looking at assembling supercomputers,
    - **Phase II** looking at manufacturing certain components within the country.
    - **Phase III** where a supercomputer is designed by India.
  - An **indigenously developed server platform called 'Rudra'** is being tried out in a pilot system, with an interconnect for **inter node communication called Trinetra** also having been developed.

Source: IE

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