

**GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
LOK SABHA
UNSTARRED QUESTION No. 3958
ANSWERED ON 19/03/2021**

DEVELOPMENT OF SUPERCOMPUTING AND QUANTUM COMPUTING

**3958. SHRI JAYANT SINHA:
SHRI P.P. CHAUDHARY:
SHRI ARJUN LAL MEENA:**

Will the Minister of **SCIENCE AND TECHNOLOGY** विज्ञान और प्रौद्योगिकी मंत्री be pleased to state:

- (a) the details of measures taken to expand India's interests in areas of advanced supercomputing and quantum computing;
- (b) whether India has been developing indigenous quantum computers and if so, the details thereof;
- (c) the details of institutions/centres housing supercomputers as of now;
- (d) whether the ministry has planned to expand the number of supercomputers and if so, the details thereof; and
- (e) the details of funds allocated and utilized to develop and provide the super-computing facility for research and other allied areas?

ANSWER

**MINISTER OF HEALTH AND FAMILY WELFARE; MINISTER OF SCIENCE AND TECHNOLOGY; AND MINISTER OF EARTH SCIENCES
(DR. HARSH VARDHAN)**

स्वास्थ्य और परिवार कल्याण मंत्री, विज्ञान और प्रौद्योगिकी मंत्री और पृथ्वी विज्ञान मंत्री
(डॉ. हर्ष वर्धन)

(a) The National Supercomputing Mission (NSM) is a National Mission jointly funded by Department of Science and Technology (DST) and Ministry of Electronics and Information Technology (MeitY). The Mission is totally of Rs 4500 crore and it is for 7 years. The implementing partners in this Mission are Indian Institute of Science (IISc)-Bengaluru and Centre for Development of Advanced Computing (C-DAC)-Pune. The DST share of funding is Rs 2740 crore whereas MeitY share would be Rs 1760 crore.

Under NSM, a Supercomputing infrastructure is being created with multiple facilities at various academic and Research & Development institutes and National Laboratories across the country. The program is working on creation of indigenous hardware and software ecosystem required for building Supercomputers.

Several applications of national interest have been initiated in the area of weather forecasting, flood forecasting, Bio informatics & drug Development platform, Computational Chemistry, Computational Physics & Materials Science, CFD & other Engineering area, Geo exploration etc.

Several R&D projects have been initiated for building algorithms that can scale up to exascale systems or software or libraries in open source for exascale systems etc.

Under Manpower Development we are committed to train about 20,000 manpower, with Computer domain or other science domain, in various areas of Supercomputing.

(b) Research in the area of Quantum communication, superconducting circuits, Quantum algorithms, etc. is initiated at various institutes in the country like DRDO, TIFR, IISER, etc. The DST has developed a new directed research programme on “Quantum Information Science and Technology (QuST)” aimed at development and demonstration of quantum computers, quantum communication & cryptography, development of quantum-enhanced and inspired technology and development of advanced mathematical quantum techniques, algorithms and theory of quantum information systems. In addition, two multi-institutional projects supported by MeitY are initiated in this area that includes i) A Centre of Excellence in Quantum Technology at C-DAC, IISc and Raman Research Institute, an Aided Institute of DST; and ii) Design and development of Quantum Computing Toolkit including a Quantum Simulator at C-DAC, IISc and IIT-Roorkee.

(c) Under National Supercomputing Mission (NSM), till now 6 Supercomputers are established which are as follows:

1. IIT-BHU, Varanasi	833 TF
2. IISER, Pune	800 TF
3. IIT Kharagpur	1.63 PF
4. JNCASR, Bangalore	833 TF
5. IIT Kanpur	1.63 PF
6. National Facility for AI, C-DAC, Pune	5.27 PF (This system has 62nd position in Top 500 Supercomputers globally in November, 2020)

Apart from the above Supercomputers under NSM, various other institutes have supercomputers. Notable among these are IITM Pune, NCMRWF Delhi, IIT Delhi, NARL, IIT Bombay, etc.

(d) Under NSM, another 9 Supercomputers are in the process of establishment at following institutes:

1. IIT Hyderabad	833 TF
2. IISc, Bangalore	3 PF
3. IIT Guwahati	833 TF
4. NIT Tiruchirapalli	833 TF
5. IIT Gandhinagar	833 TF
6. IIT Roorkee	1.63 PF
7. NABI Mohali, a DBT AI	833 TF
8. C-DAC, B'luru for MSMEs	833 TF
9. IIT Mandi	833 TF

Three more Large Supercomputers each with 3PF will be established at IIT Mumbai, IIT Chennai and Inter University Accelerator Centre, New Delhi. One National Supercomputing facility of 20PF at C-DAC, Pune is planned to be established.

(e) Under NSM, both MeitY and DST have provided funds with cumulative total of Rs 1060 crore till date to develop and provide the supercomputing facility for research and other allied areas like application developments, training, etc. As on date, funds equivalent to Rs 531 crores are utilized and commitments of Rs 428 crore on various activities in progress including purchase orders. The delivery of the systems suffered during the lock-down during the Peak of COVID Pandemic.
