

**GOVERNMENT OF INDIA
MINISTRY OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF SCIENCE AND TECHNOLOGY
LOK SABHA
STARRED QUESTION No.225
TO BE ANSWERED ON 6/3/2020**

NATIONAL MISSION ON QUANTUM TECHNOLOGIES & APPLICATIONS

***225. SHRI VINOD KUMAR SONKAR:
SHRI A. RAJA:**

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

- (a) whether the Government has announced a National Mission on Quantum Technologies & Applications (NM-QTA) with a total budget outlay of Rs. 8000 crore and if so, the details thereof;
- (b) the details of the targets set and the sectors likely to be covered under this mission along with the time by which it is likely to be implemented;
- (c) the States which are proposed to be covered under this mission and the criteria followed for identifying these States;
- (d) whether the Government has planned to invest in research and development of robotics, digital manufacturing, Artificial intelligence, Internet-of-Things (IoT), 3D printing, drones, DNA data storage, quantum computing, etc. to harness the benefits of emerging new technology and if so, the details thereof; and
- (e) the other steps being taken by the Government to develop cutting edge technologies in the country?

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) & (e): A statement is laid on the Table of the House.

STATEMENT AS REFERRED IN REPLIES TO PARTS (a) TO (e) OF LOK SABHA STARRED QUESTION NO. 225 FOR 06/03/2020 REGARDING NATIONAL MISSION ON QUANTUM TECHNOLOGIES & APPLICATIONS

(a) Yes, Sir. Government has announced a National Mission on Quantum Technology and Applications (NM-QTA) with a total budget outlay of Rs. 8000 crore. Department of Science & Technology (DST) is in the process of developing Detailed Project Report (DPR) on NM-QTA. National Consultative Meetings are being held to capture aspirations of stakeholders in the DPR. Broad objectives of NM-QTA are to promote R&D, Develop and demonstrate Quantum Computers, Quantum Communication, Quantum Key Distribution, Quantum Devices, Human Resource Development, strengthening international collaborative research, nurture innovation and startups.

(b) As the Detailed Project Report (DPR) for NM-QTA is under preparation, the specific details of the targets and sectors likely to be covered under this mission are under preparation. The duration of the mission is five years.

(c) The mission, NM-QTA is a pan -India Mission to be implemented throughout the country with academic and research institutes selected on a competitive basis by the subject expert committees.

(d) Yes, Sir.

i. Government has launched a National Mission on Interdisciplinary Cyber Physical Systems (NM-ICPS) at a total cost of Rs. 3660 crore for a period of 5 years being implemented by DST. NM-ICPS is to establish Technology Innovation Hubs (TIH) in robotics, digital manufacturing, Artificial intelligence, Internet-of-Things (IoT), 3D printing, drones, DNA data storage, quantum computing, etc. The core activities of these hubs include: Research, Technology Development, translational research, commercialization, accelerate entrepreneurship and start-up ecosystem to harness benefits of emerging new technology.

ii. Ministry of Electronics & Information Technology (MeitY), under Technology Incubation and Development of Entrepreneurs (TIDE 2.0) Scheme to promote technology entrepreneurship, provides financial and technical support to incubators engaged in supporting (Information Communication Technology (ICT) start-ups using emerging technologies such as Internet of Things (IoT), Artificial Intelligence (AI), Block-chain, Robotics etc. The Scheme will be implemented through 51 incubators by a three tiered structure with an overarching objective to promote incubation activities at institutes of higher learning and premier R&D organisations.

iii. Further, in order to foster innovation and to promote start-ups in the domains of Emerging Technologies like Internet of Things (IOT), Artificial Intelligence (AI), Augmented Reality/Virtual Reality (AR/VR), Data Analytics etc, MeitY has established Centres of Excellence (CoE). These centres connect various entities such as start-ups, enterprises, venture capitalists, government and academia to work on various problem areas and develop technology based solutions.

iv. MeitY has initiated research projects to develop some basic building blocks of Quantum Computing using Fem to second Laser approach. It also initiated a project on Development of Quantum Computing Toolkit (QC Simulator & Workbench) with the objective of Capacity building in this area.

(e) Following steps are being taken by Government to develop cutting edge technologies in the country:

i. Department of Science & Technology has initiated an R&D programme "Quantum Enabled Science & Technology (QuEST)" to groom young researchers in both experimental and theoretical research in the field of quantum technology.

ii. Department of Science & Technology and Ministry of Electronics & Information Technology has launched a National Supercomputing Mission (NSM) to connect national academic and R&D institutions with a grid of over 70 high-performance computing facilities at an estimated cost of Rs 4,500 crore. The mission has been conceptualised and evolved keeping in view the ever increasing computing demand of the scientific and academic community in the country, international technology trends and roadmaps, strategic importance and emergence of supercomputing as a benchmark for scientific and technological advancements.

iii. Considering the highly promising and competitive area of Nano Science and Technology, the Department of Science & Technology has launched a Mission on Nano Science and Technology (Nano Mission). This mission has been working to help scientists, institutions and the industry in terms of promoting basic research, development of adequate manpower

resources; international collaborations, augmentation the infrastructure for research and generation of socially useful products.

- iv. The Government has also initiated The National Solar Mission to promote solar power. The objective of the National Solar Mission is to establish India as a global leader in solar energy, by creating the policy conditions for its diffusion across the country as quickly as possible. The immediate aim of the Mission is to focus on setting up an enabling environment for solar technology penetration in the country.
- v. NITI Aayog, after extensive consultation with various Ministries and leading academicians, institutions, practitioners and industry players, has released India's National Strategy for Artificial Intelligence (NSAI) in June 2018. The Strategy outlines India's proposed efforts in research, development, adoption and skilling in Artificial Intelligence (AI).
- vi. NITI Aayog has also prepared a Roadmap on "Make in India" in Body Armour which includes recommendation on setting up of raw material manufacturing plant in India based on Ultra High Molecular Weight Polyethylene (UHMWPE) fibre to make more efficient and lightweight body armours for army and para-military forces.
- vii. Government has approved constitution of an empowered Technology Group as an institutionalized structure under the Chairmanship of Principal Scientific Advisor (PSA), to proactively lay down, coordinate and oversee national level policies relating to procurement and induction; and Research and Development (R&D) in technologies that require large outlays in resources both financial and human; and rendering sound and timely advice for determining direction and trajectory of Government's R&D and technology development programmes.
- viii. MeitY through National Informatics Centre (NIC) & National Informatics Centre Services Inc. (NICSI) created Centre of Excellence for Data Analytics (CEDA) to support government Departments to unlock hidden potential of data that is generated as a part of governance processes, and use it to improve overall governance.
