

(b) the value of electronic goods exported each year during the same period; and

(c) the comparative figures in regard to the value of these goods for the period 1984-85 and 1989-90?

THE MINISTER OF STATE IN THE

<i>Year</i>	<i>Production (Rs. Crores)</i>	<i>Export (Rs. Crores)</i>
1984-85	2081	155
1985-86	2880	178
1986-87	3855	258
1987-88	5285	343
1988-89	7030	520
1989-90	9210	850

Since foreign trade data is maintained only for broad commodity group, data for import of electronic components/good is not separately available.

Research and Development Programmes of Centre for advanced Technology, Indore

4827. SHRI M.M. PALLAM RAJU: Will the PRIME MINISTER be pleased to state:

(a) whether the Centre for Advanced Technology at Indore has come up with any innovative applications for industry and medicine, using laser and accelerator technology;

(b) if so, the details reflecting direct benefits to industry and medicine; and

MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTER OF STATE IN THE DEPARTMENT OF EDUCATION IN THE MINISTRY OF HUMAN RESOURCE DEVELOPMENT (PROF. M.G.K. MENON): (a) to (c). The total value of production and export of electronics during the period from 1984-85 to 1989-90 is as under:

(c) the annual amount spent so far on research and development by the Centre since its inception?

THE MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTER OF STATE IN THE DEPARTMENT OF EDUCATION IN THE MINISTRY OF HUMAN RESOURCE DEVELOPMENT (PROF. M.G.K. MENON): (a) and (b). Centre for Advanced Technology (CAT) has been set up to take up major programmes in the areas of accelerators and lasers. The main programme in the area of accelerators is to construct two synchrotron radiation sources, INDUS-1 and INDUS-2. These synchrotron radiation sources will emit intense vacuum ultraviolet radiation and X-ray which will find wide applications in basic research, medicine, and industry. CAT is also developing industrial electron accel-

erators which could be used in cable industry for producing heat resistant cables, food preservation, producing degradable plastics and heat shrinkable plastics etc. As part of the laser programme a 40 Watt Carbon dioxide Laser System for general surgery has been developed and is undergoing trials on animals at Hospitals. CAT is also developing other Laser systems for medical use such as Laser Photocoagulator, Laser Endoscope etc. A 500 Watt Power Carbondioxide Laser for industrial applications which can do precision cutting and welding etc. has been developed. More powerful lasers giving 1000 Watts, 2000 Watts and 5000 Watts are also under development.

(c) The amount spent are:

	<i>Rs. in lakhs</i>
Till March 1986	609.00
1986-87	272.00
1987-88	644.00
1988-89	940.00
1989-90	1266.00
Grand Total	3731.00

Indigenous Satellites

4828. SHRI SRIKANTHA DATTA NARASIMHA RAJA WADIYAR: Will the PRIME MINISTER be pleased to state:

(a) whether space-craft and satellites are being built in the country indigenously;

(b) if so, the achievement made in that regard so far; and

(c) the details of future plan of the Government with regard to further increasing India's space capabilities?

THE MINISTER OF STATE IN THE MINISTRY OF SCIENCE AND TECHNOLOGY AND MINISTER OF STATE IN THE DEPARTMENT OF EDUCATION IN THE MINISTRY OF HUMAN RESOURCE DEVELOPMENT (PROF. M.G.K. MENON): (a) Yes, Sir.

(b) India has already indigenously built a number of satellites for Space Research. Starting with the first satellite ARYABHATA, India built two experimental remote sensing satellites BHASKARA-I AND BHASKARA-II, an Experimental communication Satellite "APPLE" and Rohini Series of satellites. Having established infrastructure and capability through experimental programmes, India built its own operational remote sensing satellite, Indian Remote Sensing Satellite (IRS-IA) which was launched on 17.3.1988 and is now operational and providing data, that is being used in the areas of forestry, hydrology, geology and agriculture.

The first generation operational INSAT-I series satellites, conceptually designed by India, were procured from abroad. The second generation indigenous INSAT-II spacecraft series are already under fabrication in India. The INSAT-II series which is more complex and sophisticated than INSAT-I, consists of two test satellites, of which one is expected to be used for operational purposes, followed by three operational satellites.

The INSAT System provides for domestic long-distance Telecommunications, meteorological earth observation and data relay, nationwide direct satellite TV broadcasting to augmented community TV receivers in rural and remote areas, nationwide Radio and TV programme distribution for rebroadcasting through terrestrial transmitters, TV and Radio programme and news feed assembly from various locations and disaster warning.