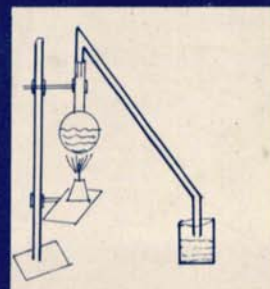
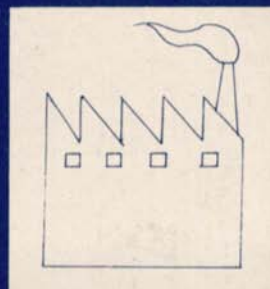
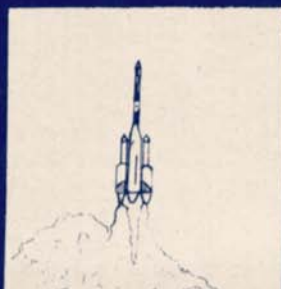
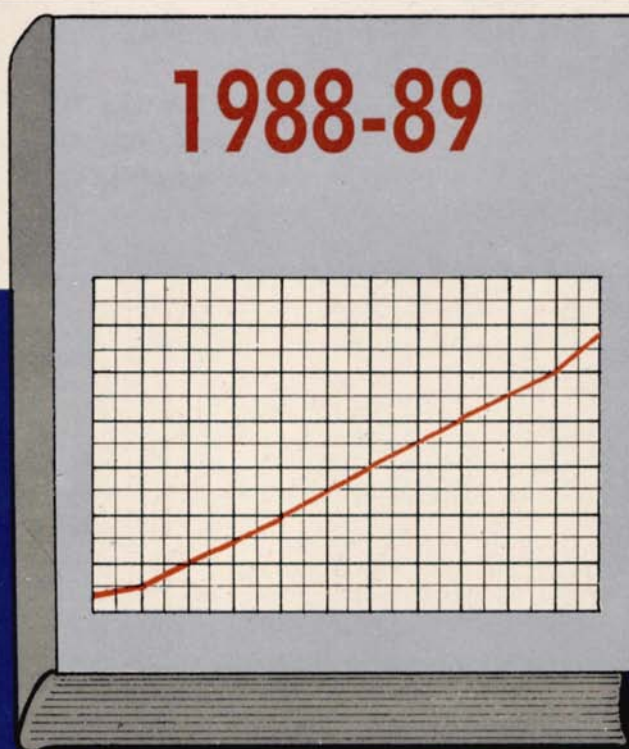


RESEARCH AND DEVELOPMENT STATISTICS



GOVERNMENT OF INDIA
DEPARTMENT OF SCIENCE & TECHNOLOGY
NEW DELHI

RESEARCH AND DEVELOPMENT STATISTICS

1988-89



GOVERNMENT OF INDIA
DEPARTMENT OF SCIENCE & TECHNOLOGY
NEW DELHI

Note : 1 crore = 10^7 = 10 millions.
1 lakh = 10^5 = 0.1 millions.

GENESIS

Over the past two decades, there is a growing need for an information system and data base on science and technology statistics (popularly called 'Science Statistics'). Policy makers particularly those concerned about planning, implementation and management of science felt the need for comprehensive information not only on the input resources which comprise mainly human and financial resources deployed and infrastructure available to science and technology activities but also the output of such activities measured in terms of increased productivity, increased economic growth, new products/processes developed, their large scale diffusion and impact on society. Such information could be useful for undertaking cost benefit analyses and other economic studies as well as for efficient programming, planning and budgeting. It will also help to compare the national efforts with that of other countries. With the growing awareness of these needs, a number of countries including India has started data collection in the field of science and technology. Over a period of time, the statistics on science and technology have enlarged by not only covering the human and financial resources deployed for science and technology activities but also covering data on education of S&T personnel, scientific services and S&T activities related to production, design, quality control, patents, foreign collaborations and so on. Such a need was also felt in India for establishing a data base for resources input to and output of S&T activities since independence but assumed seriousness since the beginning of 1970's.

S&T activities in India are undertaken by institutions/units/departments, which can be classified under the following sectors :

- Central (Federal) Government
- State (Provincial) Governments
- Higher Education Sector
- Public Sector Industry
- Private Sector Industry
- Non-profit Institutions/Associations

The extent of S&T efforts in different sectors vary in terms of quantum of resources deployed for S&T activities and the types of activities undertaken.

It may be in order to explain more about the institutional structure mentioned above. Major scientific departments with their research laboratories/institutions in the Central Government are the main vanguards of the research efforts being carried out in the country. They are : The Council of Scientific and Industrial Research (CSIR), Indian Council of Agricultural Research (ICAR), Indian Council of Medical Research (ICMR), Department of Atomic Energy (DAE), Department of Electronics (DOE), Department of Space (DOS), Defence Research and Development Organisation (DRDO), Department of Ocean Development (DOD), Department of Environment (DOEn), and Ministry of Science and Technology comprising of 3 departments — Department of Science and Technology (DST), Department of Scientific and Industrial Research (DSIR) and Department of Biotechnology (DBT). Besides, there are other Central Government Ministries/Departments who have a number of research institutions under their administrative and financial control. In addition, there are inhouse R&D units of public sector industries which are mostly under the administrative control of the Central Government but a few public sector industry are either under State

Governments or in the joint sector of Central and State Governments. The private sector industries have established their own inhouse R&D units. The inhouse research and development units are responsible for undertaking R&D activities for the respective industrial organisations. The inhouse R&D units of private and public sector industry are registered with the Department of Scientific and Industrial Research for availing of fiscal incentives. The States (Provincial) Governments have their own research institutions which mainly comprise of agricultural universities and their research stations besides having other research institutions directly under different departments of the State governments. The higher education sector undertake research activities mostly of basic (fundamental) and applied research through their own funds as well as the projects sponsored by the major scientific departments of the Central Government. There are non-profit research associations/institutions which carry out R&D activities and these are supported by either industry or government or both.

After having outlined the S&T system, it may be quite in order to trace the history of policy, planning and growth of S&T in India. The country has adopted the Scientific Policy Resolution in 1958. The aims of the scientific policy are to foster, promote and sustain the scientific research, to ensure adequate supply of scientists of highest quality and to recognise/reward their work and to secure for the people of the country all benefits from the acquisition and application of scientific knowledge. The Government of India has decided to pursue and accomplish these aims by offering good conditions of service to scientists and according them an honoured position, by associating scientists with the formulation of policies and by taking such other measures as may be deemed necessary from time to time. The Technology Policy Statement was adopted in 1983. The aims of the technology policy are to attain technological self reliance, to make maximum use of indigenous resources, to provide maximum gainful employment, to develop technologies which are internationally competitive and to reduce demands on energy. The country has also revised its educational policy of 1968 and adopted a New Education Policy in 1986 to make the educational system to fulfill the needs of the society in keeping with the technological development. The New Educational Policy aims to redesign courses and programmes of higher education to meet the demands of specialisation better, to enhance support for research in the universities and ensure its high quality and to develop interdisciplinary research.

Due to the above policies, infrastructure for education and for research and development has expanded enormously. At present, there are nearly 180 universities, 6000 colleges and 2100 research and development institutions in the country.

In order to advise, plan for the growth of science and technology and to monitor the implementation of the aims of the S&T policies, high level committees have been created to guide the government on matters related to science and technology policy, planning and implementation. The members of the committees are carefully chosen and they are eminent persons representing a cross section of S&T fields. Such committees created at various points of time are briefly explained in the next paragraph.

A Scientific Advisory Committee (SAC) was created in 1958 and this was replaced by the Cabinet Committee on Science and Technology (COST) in 1968. Subsequently, in 1971, Government has constituted National Committee on Science and Technology (NCST) replacing COST. NCST has prepared for the first time a separate S&T plan document for the country, though this exercise was not

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pursued after. NCST, for the first time, has also prepared an "Approach Paper" for S&T planning. On the advice of NCST, the Department of Science and Technology (DST) was set up in 1971 to implement and coordinate activities which are multidisciplinary in nature and involve multiagencies/ministries. NCST was reconstituted as Science Advisory Committee to the Cabinet (SACC) in 1981 and this Committee was instrumental in the simplification of some of the administrative procedures for S&T ministries/institutions and also in recommending to increase amenities/facilities to S&T personnel. Presently, there is a Science Advisory Council to the Prime Minister (shortly SAC to PM) in place of erstwhile SACC and this Council is entrusted with the responsibility of preparing a blue print for S&T in the year 2000. The Council has prepared several status papers on emerging and frontier technology which are under the active consideration of the Government for implementation.

Though the above Committees at various points of time offered advice to the Government on S&T matters, the identification of science and technology programmes and financing them are to be prepared by the concerned ministries/departments. The budget allocations are determined by the Planning Commission by considering the overall availability of funds and inter se priority between different programmes. In order to allocate funds on scientific basis, the Planning Commission has appointed a Steering Group for Science and Technology for determining the thrust and emerging areas and programmes of importance in science and technology. The Members of the Steering Group comprise of both experts and officials from concerned S&T ministries/departments. The S&T departments/ministries constitute their own Working Groups and prepare comprehensive documents after much deliberation indicating their programmes and desired allocation for each of them. The S&T Working Groups again draw memberships from relevant ministries/agencies and experts. The approach and thrust to S&T planning have been gradually more focussed and sharpened over the successive five year plans and it may be useful to give in brief about the approach of the various plans for science and technology. This is dealt with in the ensuing paragraphs.

All the national plans have given a significant place to science and technology. The First Five Year Plan, which started in 1952, gave importance to the establishment of infrastructure. The most significant aspect during the period was the establishment of a chain of national laboratories and research institutes in essential disciplines, located in different parts of the country.

In addition to objectives initiated in the First Plan, the efforts were directed in Second Five Year Plan to strengthen the existing research facilities, coordinate research between agencies, link research work at national level with regional/state levels, create sufficient S&T manpower base, utilise and reward such manpower. It should be mentioned that Indian Scientific Policy Resolution was announced in 1958, that is during the Second Five Year Plan period. It may be seen that the Resolution clearly indicated the objective to accord a prominent place and priority for science in the national plans.

The emphasis in the Third Five Year Plan was on encouraging basic research in universities and training research personnel and to expand the programme of research fellowships and scholarships, the development and manufacture of scientific and industrial instruments and investments in pilot plant trials and full scale experiments. During the Third Five Year Plan, S&T has started to make perceptible contributions to the development of the country, which could be seen in the method of improved farming, better health, speedier transport facilities,

generation of energy for industrial use and so on. A large number of management problems had also come up during the Third Plan. It was felt that the application and commercial exploitation of scientific results were not enough.

The effort in the Fourth Five Year Plan was therefore naturally directed to integrate industrial research with programmes of industrial development, achieve greater coordination of inter-laboratory level and evaluate research programmes periodically at different levels.

In Fifth Five Year Plan, a major departure was initiated to formulate science and technology plan. Firstly, a document entitled "Approach to Fifth Five Year Plan" was prepared and widely circulated for comments. Further, a series of meetings were organised to discuss the document in different parts of the country. As a result of the comments received and discussions held at the meetings, the "Approach" document was finalised. Expert panels for different areas of science and technology were formed and they have submitted their plans for these areas taking the "Approach" document into account. These plans were then integrated at the level of Planning Commission.

The Sixth Five Year Plan followed a different procedure. The Draft Plan was prepared on the basis of wide ranging discussions with the scientists all over the country. The draft document was discussed in a conference of eminent scientists and technologists from different walks of life. The document was finalised by a panel of experts formed by the Department of Science and Technology, which was then discussed by the Planning Commission and the modified document included in the Sixth Five Year Plan.

For the Seventh Five Year Plan, a Steering Group Report for Science, Technology and Environment has been prepared based on the extensive discussion with a large number of scientists and technologists and closely scrutinised and finalised by a panel of experts. This report can be considered as a Draft S&T Plan for Seventh Plan. The new features of this document are that it has emphasised that a number of S&T programmes and projects must have a mission (goal) oriented approach to achieve the desired results (even excellence) within a time frame in the plan period and a number of thrust/frontier areas of S&T has been identified for implementation. The Steering Group Report has taken note of the various Working Group Reports on S&T prepared by each ministry/department of the central government.

The country is in the process of preparing S&T component of the Eighth Five Year Plan. The method of preparation of S&T programmes is more or less similar to what has been done in the Seventh Five Year Plan.

The S&T Plans, which are integrated with the national plans, have been formulated with the objective to subserve those of the national plans – for example, the main thrust of the Fifth Five Year Plan was removal of poverty and attainment of self-reliance and the main thrust of the Sixth Five Year Plan was growth, modernisation, self-reliance and social justice.

The investment made in different fields of S&T are indicative of the emphasis given to different areas. The investment may be in terms of both financial and manpower resources. The pattern of investment by different sectors, the pattern within each sector by different objectives/fields of science/category of research, the investment in terms of the socio-economic variables and such other and the output of science and technology measured in terms of a number of

variables, the qualitative judgement of S&T development etc. should be studied, if a country really wants to evaluate the S&T Policies and Planning. This, then, requires a sound science and technology statistical system to provide reliable and timely science and technology data and analyses in variety and form for both input and output parameters of S&T backed by information and documentation. In addition, these input and output statistics and analyses will have to be correlated with socio, economic and even political variables in order to see the possible impact for S&T however approximate or indirect such impact may be. Therefore, one has to review not only the S&T statistical system but also the statistical system of socio and economic parameters. In the next few paragraph, the statistical system for S&T will be discussed which will also deal with socio economic statistical system in brief.

In order to do proper analyses of the policy, planning and growth of science and technology in a country, a comprehensive appraisal of input to S&T activities in terms of funds, personnel, infrastructure and quantification of output/benefit accrued from these activities in terms of publications, patents, new products/processes and many other are necessary. Besides, appraisal on the dissemination of research results, the impact of R&D investment on socio-economic aspects is essential. It is in this spirit that the data and analyses on S&T are important.

India has a well established statistical system for the economic sector and data are being collected through various statistical systems/organisations and the major one being the Central Statistical Organisation (CSO). The socio-economic statistical system also include the Statistical Bureaus/Directorates under the various State Governments. But these statistical organisations/systems do not collect data related to science and technology excepting the educational statistics collected by the University Grants Commission and the Department of Education. Therefore, a need was felt for the collection of S&T statistics in the country. The progresss made in the efforts to collect S&T statistics is detailed in the ensuing paragraphs.

It may perhaps be useful at this point to trace the history of S&T data collection mechanism and changes undergone by it over a period of time. The first attempt to collect information on expenditure incurred on scientific research in India was made in 1958 (incidentally, Scientific Policy Resolution was adopted in 1958) at the initiative of the then honorary Statistical Adviser to the Government of India. Data for the years 1955-56 and 1956-57 were compiled from the Demand for Grants of the Central Ministries, the State Governments, the records of University Grants Commission etc. The data collected have suffered from a number of drawbacks and could not be considered reliable. The budget papers gave only a lump sum figure and not the break-up of expenditure on research and non-research etc. which was actually needed. Double counting of grants extended by Centre to State Governments could also not be ruled out. It was also not unlikely that some expenditure on scientific research might have been grouped under other heads as well. Further, information regarding scientific and technical personnel belonging to different categories was also not available.

In 1959, an attempt was made to collect data by mailing a specially designed questionnaire to scientific institutions, universities etc. This questionnaire sought information separately for research and development expenditure, scientific and technical manpower etc. A similar exercise was made in 1961. The responses to these surveys were not very encouraging and the data collected was used only for preparing internal reports. In the following years between 1962 to 1968, several meetings were held under various fora to devise methods to tackle the problem of data collection on S&T but with very limited success.

In August 1968, the Government of India has constituted the Committee on Science and Technology (COST). One of the charters of the Committee was to survey the existing state of science and technology in the country and to plan for future developments in various fields of science and technology in the next 10-12 years. As a part of this exercise, the Committee collected statistics on resources devoted to R&D in the country both in the Government institutions and the private sector. The magnitude of the private sector R&D activities and that of the State Governments could not be assessed properly. Nevertheless, one could get more or less reliable estimate of the R&D effort of the institutions under major scientific agencies of the Central Government as they almost accounted for three-fourth of the total national R&D effort. The data collected by the Committee formed an annexure to the report titled 'Annual Report on Science and Technology 1969'. It then started collecting data on R&D at periodic intervals which resulted in bringing out of two similar reports for 1969-70 and 1970-71. The coverage was gradually increased and the report for 1970-71 has even covered data on R&D of 100 private companies in addition to the Government institutions.

Having attained some success in the collection of data on R&D, it was decided in 1972 to collect some further details about the research efforts made in the country. A detailed questionnaire asking for information regarding expenditure on salaries and wages, consumable materials, pilot plants, original book value of capital equipment and its replacement value was finalised in consultation with the various experts in the field. The response to this survey was very lukewarm and most of the respondents stated that it was not possible to provide such detailed information as no records were kept by them to facilitate this sort of computation.

In 1971, the Department of Science and Technology was set up and the responsibility of undertaking these studies was entrusted to this Department. Since then, the Department is the nodal agency in India to establish S&T statistical system and collect science statistics at regular intervals on a national scale. A separate Science and Technology Statistics Division (STS Division) has been identified in DST which has been entrusted with the responsibility of carrying out the studies relating to resources devoted to S&T activities.

The STS Division undertakes biennial national surveys on a regular basis to collect data for the latest three years including the year of the survey. The questionnaire for collection of statistical data is continuously examined and redesigned in the light of the experience gained from previous surveys. The coverage of the private sector has increased enormously and enhanced coverage was also given to the institutions under the State governments. These data are processed, compiled, tabulated and analytical reports are published. Considering the amount of work involved in processing the data, a computerised system, design and software package has been developed for loading/editing, storage, retrieval and processing of the data. The questionnaire has been so designed as to be amenable to computerisation.

For the first time, a comprehensive publication giving statistical data on R&D in the country titled 'Research and Development Statistics, 1973-74' was brought out. This exercise is being repeated at periodic intervals and similar reports have been published for 1974-75, 1976-77, 1978-79, 1980-81, 1982-83, 1984-85 and 1986-87 based on the respective surveys. The present report is for the year 1988-89. Over the years, in all these publications not only has the coverage been gradually enlarged but steps have also been taken to implement

the recommendations of UNESCO regarding international standardisation of statistics. Besides the regular reports, analytical papers based on the data collected and a number of information directories/booklets are brought out from time to time. A list of publications brought out till date based on data collected through national surveys is given at end of this report. The STS Division of DST renders advice on concepts/terminologies used and is also responsible for liaison with UNESCO and other international and national organisations on science statistics and science resources studies.

The present report contains detailed data and analyses which include R&D expenditure by sector, by objectives, by categories of research, by fields of research, R&D manpower by sector, by level of qualification/fields of study, by income level, by sex, international comparison of R&D efforts, enrolment/out turn/stock of S&T manpower and patents data. Care has been taken to estimate non-responses.

It may be mentioned that there is a long time lag in receiving the completed questionnaires from the responding R&D institutions/units, besides the problem of receiving incomplete/inconsistent data. As a consequence of these, the publishing of the final report tends to get delayed. However, the Department of Science and Technology continues to try hard to minimise the delay in bringing out the Research and Development Statistics report, as it enjoys wide circulation and acts as a source book for S&T policy makers, planners and researchers.

HIGHLIGHTS

- The national investment on R&D activities attained a level of Rs. 3471.81 crores during 1988-89. The same for the year 1989-90 has been estimated to be Rs. 4003.79 crores.
- 1.00% of gross national product was devoted to R&D activities in the country during 1988-89.
- In the institutional sector about 12% of the total expenditure was spent on basic research, 35% on applied research, 32% on experimental development and the rest 21% on other supporting activities.
- About 92.5% of the expenditure incurred from the government sources came from central government and rest 7.5% from the state governments. About 75% of the expenditure incurred by central government came from major scientific agencies like Atomic Energy, Space, CSIR, ICAR etc. and the rest came from other central Ministries/Departments. Amongst the major scientific agencies, Defence Research and Development Organisation accounted for 27% of the expenditure.
- State sector spent Rs. 232.91 crores on R&D activities during 1988-89. About 98% of the R&D expenditure by the state sector was spent for the development of agriculture and allied areas. About 18.4% of total state sector R&D expenditure was by the State of Maharashtra.
- Rs. 725.11 crores was spent on R&D by industrial sector in 1988-89. The number of units involved were 895 in the private sector and 121 in the public/joint sector. The share of Industrial sector R&D in total national R&D was 20.9% during 1988-89.
- Industry spent 0.72% of their sales turnover on R&D in 1988-89. About Rs. 129.70 crores of the total expenditure by the industrial sector was in the group of Defence Industries. Next to this was Electricals & Electronics with about Rs. 118.03 crores of total industrial sector R&D expenditure.
- As on 1.4.1988 nearly 2.68 lakh personnel were employed in the R&D institutions in the country including inhouse R&D units of public and private sector industries. Out of this 37% were performing R&D activities, 31% were performing auxiliary activities and rest 32% were providing administrative and other non-technical support.
- There were 4893 females directly engaged in R&D activities.
- 44.7% of the total personnel employed primarily for R&D work were from engineering and technology background, 28.7% were from natural sciences, 22.7% were from agricultural sciences, 2.1% were from medical sciences and the rest 1.7% were from social sciences. 42.9% had post graduate or above qualifications, 26.6% had graduate degree and rest 30.5% had diploma or other qualifications.
- There were 174 universities which include 142 universities, 22 deemed universities and 10 institutes of national importance during 1987-88. Pure science doctorates had a share of 73.2% of total 4010 S&T doctorates produced during 1986-87.
- Patents sealed in the year 1987-88 was 2104 and out of which 588 were sealed by Indian citizens. This is a mere 28% of the total patents sealed. Maximum number of applications filed by Indians were from the Union Territory of Delhi (29.5%).
- In relation to population, stock of S&T personnel for India is not high as compared to that observed for developed countries. India has only 3.43 SET personnel per thousand population. Only 0.22 SET per thousand were employed in R&D.
- In the year 1970, developed countries accounted for 97.4% of the total expenditure for research and development in the world. This figure has come down to 93.7% in 1980. Most of the developed countries devoted 2 to 3% of their GNP on R&D while India has spent 1% of GNP on R&D. India's per capita R&D expenditure was only a mere US \$ 3.06 whereas this was between US \$ 100 and US \$ 400 for most of the developed countries.
- More than two third of total investment for research and development in the world was by the countries in the continents of America and Europe during
- Plan allocation for S&T increased from Rs. 142 crores in the fourth plan to Rs. 4257 crores during the seventh plan. The share of S&T in the total public sector outlay was 2.4% during the 7th plan.

CHAPTER I

NATIONAL RESOURCES FOR SCIENCE AND TECHNOLOGY

In this chapter, the resources deployed for science and technology at the national level would be analysed.

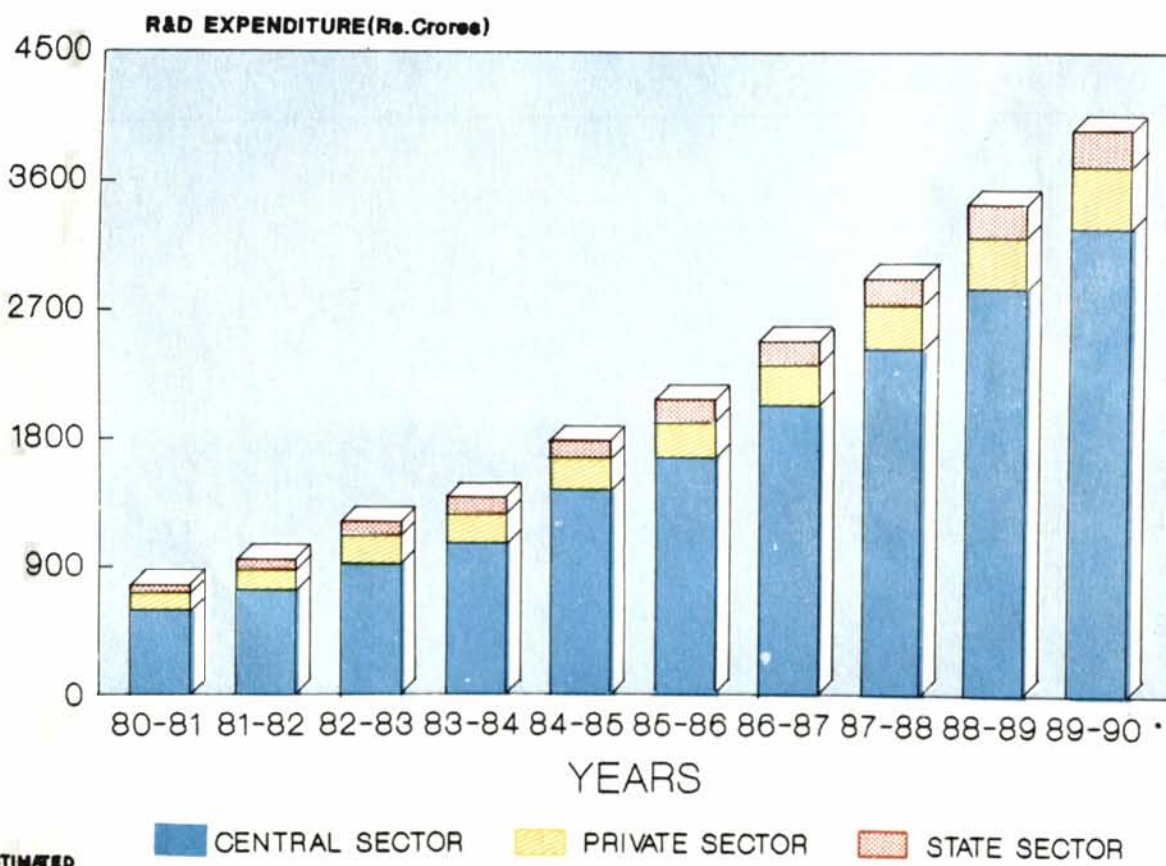
The national expenditure on research and development (R&D) and related science and technology (S&T) activities has increased from Rs. 2692.75 crores in 1986-87 to Rs. 3770.98 crores in 1988-89. Based on the trend available, the estimated expenditure for research and development and related S&T activities would be of the order of Rs. 4373 crores in 1989-90.

Having highlighted the national expenditure on science and technology activities which constitute mainly research and development expenditure and

to a small extent the supporting activities of R&D, the rest of this chapter would deal with the analyses of data related to resources deployed for research and development activities only.

The national expenditure on R&D has increased from Rs. 2495.87 crores in 1986-87 to Rs. 3471.81 crores in 1988-89. By applying the appropriate rates of growth for different sectors as observed over a period of time, the projected R&D expenditure would reach a level of about Rs. 4004 crores in 1989-90. The compound annual rate of growth of R&D expenditure at current prices for the period 1986-87 to 1988-89 has worked out to be 17.9% and the rate of growth of R&D expenditure at constant prices for the same period was 9.2%

TREND IN NATIONAL EXPENDITURE ON RESEARCH AND DEVELOPMENT



R&D expenditure at constant prices has increased from Rs. 1565.13 crores in 1986-87 to Rs. 1866.29 crores in 1988-89.

Out of the total R&D expenditure for the year 1988-89, the share of the central government including the public sector industry was 82.8%, the share of the private sector was 10.5% and the rest 6.7% was incurred by the state governments. If one considers industrial sector as a whole comprising both public and private sector, the share of industrial sector in the total national R&D expenditure accounted for 20.9%. Such a share was the same as observed during the year 1986-87.

By viewing the R&D expenditure between institutional sector in both Federal and Provincial governments and industrial sector comprising of both public and private industries analyses have shown that 79.1% of the R&D expenditure was incurred by the institutional sector and the rest 20.9% was incurred by the industrial sector. This is contrary to what one observes for the developed countries where the share of industrial sector in the national R&D expenditure is more than 50%.

R&D expenditure was 1.00% of GNP in 1988-89 and the same was 0.96% in 1986-87. It may be of interest to highlight the point that annual compound rate of growth of GNP for the period 1986-87 to 1988-89 was 15.7% whereas the growth rate of R&D expenditure was 17.9% for the same period. This shows that R&D expenditure is increasing faster than GNP.

The Indian national survey on R&D has adopted the UNESCO classification of R&D expenditure into 13 objectives. Ideally, the R&D expenditure should be apportioned between 13 objectives based on projectwise expenditure. Such an exercise is not feasible and therefore a rough method has been adopted by assigning each R&D institution to specific objectives depending upon its predominant activities. On this basis, the share of R&D expenditure by different objectives is given in Table 1.1.

The expenditure for S&T activities has been classified by type of work based on the estimates provided by the R&D institutions in the central and state governments. Such a classification of expenditure by type of work is not available for the indus-

R&D EXPENDITURE AS PERCENTAGE OF GROSS NATIONAL PRODUCT

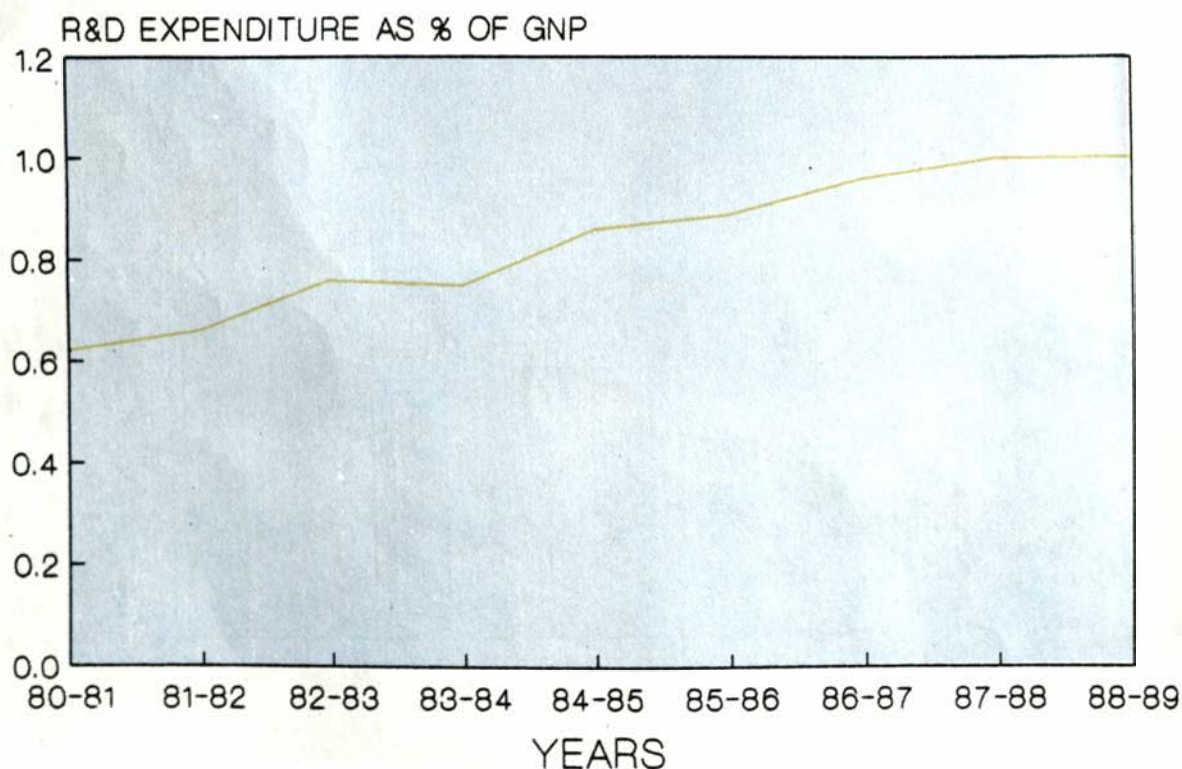


Table 1.1
RESEARCH AND DEVELOPMENT EXPENDITURE
BY OBJECTIVES FOR 1988-89

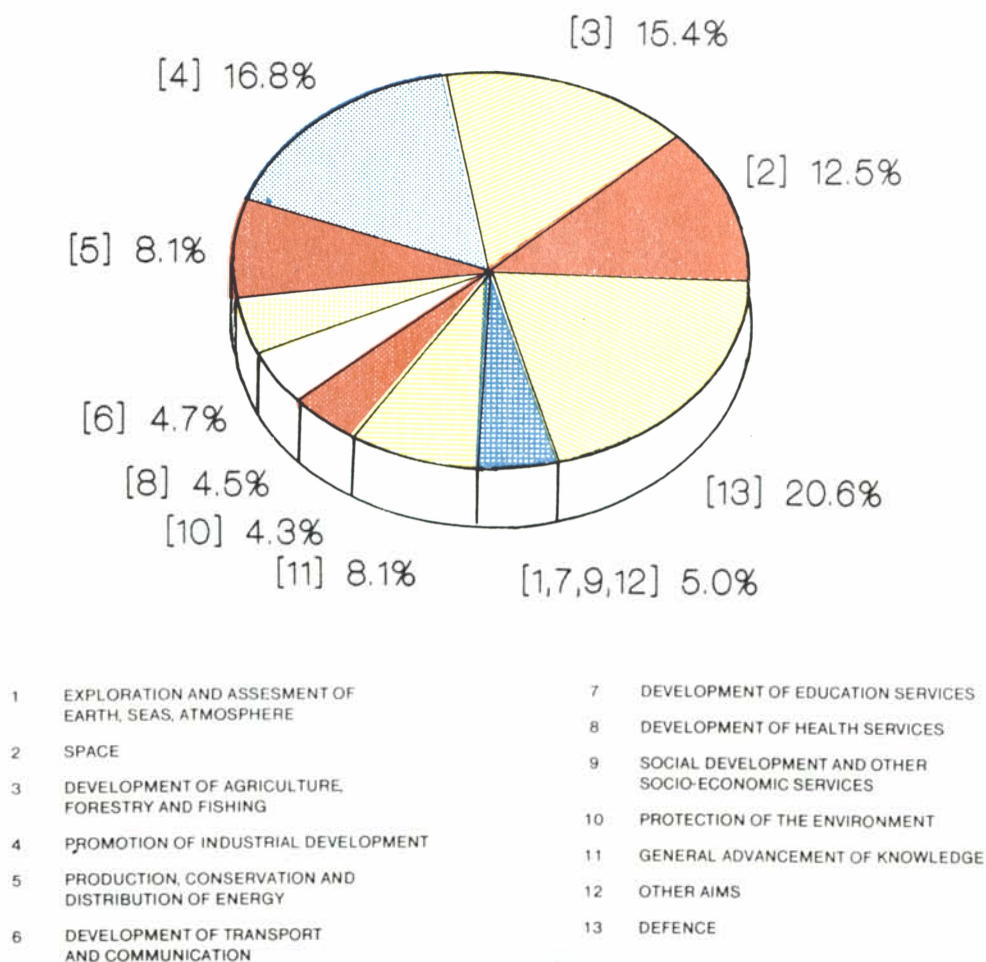
Objective	Percentage
Defence	20.6
Promotion of Industrial Development	16.8
Development of Agriculture, Forestry and Fishing	15.4
Space	12.5
General Advancement of Knowledge	8.1
Production, Conservation and Distribution of Energy	8.1
Development of Health Services	4.5
Protection of Environment	4.3
Development of Transport and Communication	4.7
Others	5.0

trial sector. During the year 1988-89, the percentage share of basic research was 11.9, applied research 34.8, experimental development 32.0 and the related supporting activities was 21.3. Table 1.2 gives the break up of S&T expenditure by type of work for the year 1988-89.

Table 1.2
S&T EXPENDITURE BY TYPE OF WORK FOR 1988-89

Type	Percentage
Basic Research	11.9
Applied Research	34.8
Experimental Development	32.0
Other Activities	21.3

PERCENTAGE SHARE OF R&D EXPENDITURE BY OBJECTIVES DURING 1988-89



Central government including public sector has accounted for 82.8% of the total national R&D expenditure during 1988-89. Major scientific agencies has infact accounted for a share of 75.2% of the total central government R&D expenditure. At the national level, major scientific agencies have shared 62.3% of the national R&D expenditure. Between the scientific agencies, the share of R&D expenditure is presented in Table 1.3

80% of the total R&D expenditure of the major scientific agencies was consumed by five agencies — DRDO, DOS, DAE, CSIR and ICAR in that order with DRDO alone accounting for a share of 26.7%.

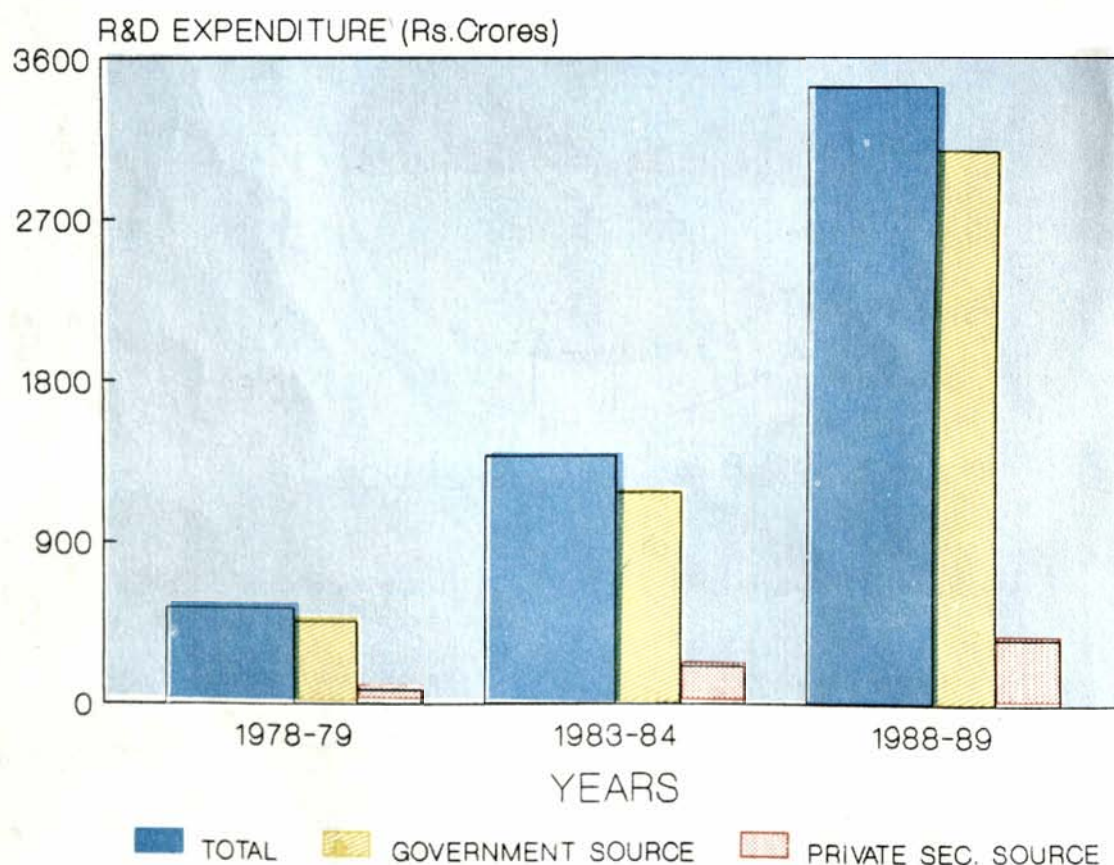
Industrial R&D expenditure has increased from Rs. 527.33 crores in 1986-87 to Rs. 725.11 crores in 1988-89. The respective share of public and private sectors in their total was 49.8% and 50.2% though the number of R&D units in each of these sectors vary.

Table 1.3
R&D EXPENDITURE BY MAJOR SCIENTIFIC AGENCIES DURING 1988-89

Agency	Percentage
Defence Research and Development Organisation (DRDO)	26.7
Department of Space (DOS)	20.0
Department of Atomic Energy (DAE)	14.0
Council of Scientific and Industrial Research (CSIR)	9.8
Indian Council of Agricultural Research (ICAR)	9.3
Department of Science and Technology (DST)	7.2
Department of Environment (DOEn)	6.8
Indian Council of Medical Research (ICMR)	2.1
Department of Biotechnology (DBT)	1.6
Department of Non-Conventional Energy Sources (DNES)	1.2
Department of Ocean Development (DOD)	1.0
Department of Electronics (DOE)	0.3

As on 1st April, 1988, nearly 2.68 lakhs personnel were employed in the R&D sector. Out of them, 36.7% of the personnel were primarily engaged on

R&D EXPENDITURE BY SOURCES OF FUNDS



R&D work, 30.6% were performing auxiliary (technical supporting) activities and the rest 32.7% were doing administrative and other non-technical activities. There were 4893 females directly engaged in R&D activities which accounted only 5% of the total S&T personnel engaged in R&D work. Educational qualifications and fields of studies of 71679 S&T personnel engaged in R&D work were available. The analyses of such data showed that 28.7% of the R&D personnel have specialised in natural sciences and 44.7% of them were from engineering/technology disciplines. The institutional and industrial sector employment of R&D personnel by major disciplines has shown that 30% and 26% of R&D personnel in the institutional sector were respectively from natural sciences and engineering/technology while 27% and 69% of R&D personnel in the industrial sector belonged to natural sciences and engineering/technology disciplines. The composition of S&T personnel engaged in R&D activities by level of educational qualifications has indicated that 14.4% were Ph.Ds, 28.5% were postgraduates, 26.6% were graduates, 9.1% were diplomas and the rest (a large percentage though) 21.4% were 'others' (not classified under the above levels of qualifications). It may also be worth mentioning that about 80% of the Ph.Ds and 70% of postgraduates were employed in the institutional sector.

International comparison of R&D efforts provides an opportunity to understand the country's position in relation to other countries. Most of the developed countries spend over 2% of their GNP on R&D but developing countries spend around 0.5% with some exceptions. R&D spending of 1.00% of GNP in India was though no doubt higher than a number of developing countries, the country needs to enhance its R&D expenditure manifold to reach a level of over 2%. India has 3.43 scientists, engineers and technicians per thousand population whereas the same for Japan was 313.58 and for USA 14.78. Similarly, scientists, engineers and

technicians engaged in R&D per thousand population for India was about 0.22 while USA has 3.28 and Japan has 5.58.

From Fifth Five Year Plan, India's S&T programmes have got a big boost in as much as the total plan and non-plan allocation has reached a level of Rs. 1381 crores which was nearly four fold increase over the Fourth Five Year Plan. The Seventh Five Year Plan had an allocation of over Rs. 7500 crores. Almost 75% of the allocation was made to major scientific agencies.

Questions are often asked whether the productivity of R&D is commensurate with the level of investment made by the country. No model has so far been evolved, either in this country or even in the developed countries to evaluate the productivity of R&D. In the absence of such indicators, attempts are made to look at some parameters even if they are only indirect efficiency indicators. Patent statistics is considered to be one such indicator. The number of applications for patents has not been showing a consistent trend. The number of applications for patents made every year varied around three thousands over the period 1976-1987 and it was 3457 for the year 1987-88, the latest year for which data is available. The number of patents sealed varied between eight hundred to three thousand during 1976-1987 and it was 2104 in 1987-88. The number of patents in force as of 1987-88 was 12265. As is well known, many foreign nationals take patents in countries other than their own with a view to putting a curb on the commercialisation of products developed by them. The number of patents sealed in the name of foreigners was almost two to three times those sealed for Indians. So, it may be seen that the number of foreign patents in force during the year 1987-88 was almost five times the number held by Indians. Amongst the foreign nationals, those from USA accounted for 950 out of 2527 applications made during 1987-88.

To sum up the salient features are as follows :

- The national R&D expenditure has increased from Rs. 2495.87 crores in 1986-87 to Rs. 3471.81 crores in 1988-89.
- The share of R&D expenditure of the central government including public sector industry was 82.8%.
- R&D expenditure by institutional sector was

79.1% of the total national R&D expenditure and the rest 20.9% was incurred by industrial sector consisting of both public and private sector industry.

- India has spent 1.00% of her GNP on R&D.
- As on 1st April, 1988, nearly 2.68 lakh personnel were employed in the R&D sector and out of this, nearly 97000 personnel were employed directly on R&D work.

CHAPTER II

SCIENTIFIC & TECHNICAL MANPOWER

The planning and formulation of science policy requires the knowledge of the total numerical strength of most qualified human resources namely the total stock and the number of economically active scientific and technical personnel. It is therefore, necessary to study in depth the range and the extent of availability of S&T manpower and their deployment pattern. With this in view the Government of India appointed a Scientific Manpower Committee in 1947 to advise on the best methods of utilising and augmenting the scientific manpower resources in the country. A Scheme on national register for scientific and technical personnel was introduced. Since this registration was voluntary and the response was not upto the mark, this scheme could not serve the purpose of getting information on the stock of S&T personnel. Another problem was that S&T personnel were not only engaged in S&T activities but were engaged in multifarious activities like production, teaching, extension, management, administration, quality control, banking etc. They were employed in different types of organisations situated in far flung areas of the country. Keeping this in view, it was felt that a head count of total stock of S&T personnel at a frequent interval of time was not only time consuming and costly exercise but impracticable also. Therefore, it was decided that this activity should be taken up alongwith the census survey. The first survey of S&T personnel was conducted alongwith the 1961 census of decennial population. As a result of which, particulars of 2.45 lakhs personnel were collected. The studies based on 1961 data on S&T personnel proved to be very useful in education and manpower planning. After a decade, in 1971 it was decided that the extent and coverage of this exercise be extended to all degree holders and technical personnel in all faculties. About 22 lakhs filled in questionnaires were received which helped to conduct a number of studies on S&T manpower planning.

The surveys of 1961 and 1971 were conducted on complete enumeration basis. However, at the time of 1981 census, it was not considered feasible to have the complete enumeration. Consequently the efforts were made to collect the data on 20% sample basis in 12 states. While a complete enumeration was conducted in other states/union territories except the state of Assam. The total num-

ber of schedules of S&T personnel collected through degree holders and technical personnel surveys conducted in 1961, 1971 and 1981 were 2.45 lakhs, 8.79 lakhs and 16.45 lakhs respectively. The details of post graduate degree holders and technical personnel survey to be taken up in 1991 are being worked out.

It was considered desirable to undertake a study to find out the extent of non response to evolve a more reliable correction factor for arriving at reasonable correct estimates of degree holders and technical personnel in the country. The post census non response survey was conducted in Delhi and Calcutta and it was found that the non response rates were as high as 58% and 52% respectively. The non response of this order has obviously affected the estimates of various characteristics of S&T personnel envisaged to be computed from this survey. Nevertheless some valuable and useful data analyses have been obtained. The analyses have thrown light on various characteristics of S&T personnel in the country though the data base was nine years old. Some of the salient features of 1981 survey are given in the ensuing paragraphs.

The percentage distribution of S&T personnel by level of qualification in different fields of specialisation as per 1981 survey are delineated in Table 2.1. It may be mentioned here that the field natural sciences includes psychology, education, and other social sciences, agricultural sciences includes veterinary sciences, medicine includes allopathy, ayurvedic, unani and homeopathy and engineering includes technology.

According to the level of qualifications 1.4% were doctorate degree holders, 17.7% were post graduates, 64.6% graduates; besides 16.3% were having "other" qualifications including under graduate diploma, under graduate certificate and others but exclude ITI certificate holders. By fields of specialisation 58.4% had natural sciences background, 27.2% had engineering, 9.3% had medical and rest 5.1% had agricultural sciences background. It has been revealed from the degree holder and technical personnel surveys of 1961, 1971, and 1981 that the percentage of women have been constantly rising among S&T personnel. In 1961, there were 4.4% women, the percentage

Table 2.1
DISTRIBUTION OF S&T PERSONNEL BY LEVEL OF QUALIFICATIONS & FIELD OF SPECIALISATION

Qualification	Field of specialisation				Total
	Natural Sciences	Agricultural Sciences	Medicine	Engineering	
Ph.D.	14134	2694	506	2879	20213
Post Graduates	184013	15876	30796	25867	256552
Graduates	644949	52196	84225	152855	934225
Others	1540	2367	19141	211480	234528
Total	844636	73133	134668	393081	1445518

increased to 12.4% in 1971 and this has further increased to 14.8% in 1981.

The Planning Commission had undertaken exercises to estimate the stock of S&T personnel at the beginning and at the end of plan period. Estimated stock of S&T personnel for the years 1985 and

engaged in R&D activities. 30.3% were performing auxiliary activities. 32.3% were providing administrative or non technical support and for the rest 1.2% professional status were not known. The information regarding the deployment of S&T personnel in institutional sector and industrial sector is provided in Table 2.3.

Table 2.2
ESTIMATED STOCK OF S&T PERSONNEL IN 1985 AND 1990

Field	Stock of S&T Personnel (in thousands)		Percentage rate of growth
	1985	1990	
Engineering degree Holders	372.6	454.4	4.0
Engineering Diploma Holders	564.2	734.8	5.5
Medical Graduates	258.7	302.4	3.1
Agricultural Graduates	133.3	162.8	4.1
Veterinary Graduates	28.3	33.4	3.4
Science Graduates	1138.3	1339.4	3.3
Science Post Graduates	350.3	419.7	3.7

1990 according to 7th plan document is compiled fieldwise and the same is shown in Table 2.2.

It may be seen from Table 2.2. that engineering diploma holders have the highest growth rate of 5.5%. This is followed by agricultural graduates and engineering degree holders.

As mentioned in the beginning of the chapter, S&T personnel available in the country are not engaged in S&T activities but are performing multifarious activities. The information on the number of scientific and technical personnel employed in R&D institutions and in house R&D units of public and private sectors in the country were collected through a mail card survey by the Department of Science & Technology. As on 1st April, 1988, nearly 2.68 lakhs S&T personnel were engaged in research and development and related S&T activities. Out of these 36.2% were primarily

Table 2.3
**PERCENTAGE DISTRIBUTION OF S&T PERSONNEL
BY TYPE OF EMPLOYER/ACTIVITY IN 1988-89**

Activity/ Employer	Percentage of Personnel employed			
	R&D	Auxiliary	Adminis- trative	Total
Institutional Sector	33	30	37	100
Industrial Sector	49	32	19	100

It may be noted that there is confirmity in the deployment pattern of auxiliary personnel in both the sectors whereas in case of R&D and administrative personnel, there is quite divergence. Industrial

sector has comparatively higher proportion of personnel engaged in R&D activities and low proportion of personnel engaged in administrative activities compared to the institutional sector. This may be on account of the fact that in industrial sector the number of persons providing administrative support are not fully reflected. In case of some of the industrial units, administrative facilities are common to R&D as well as other non R&D activities and so, data for administrative personnel were not available separately.

An attempt has been made to find out number of auxiliary and administrative personnel for each R&D personnel employed for a few selected departments as also for public and private sector industries. This information has been provided in Table 2.4.

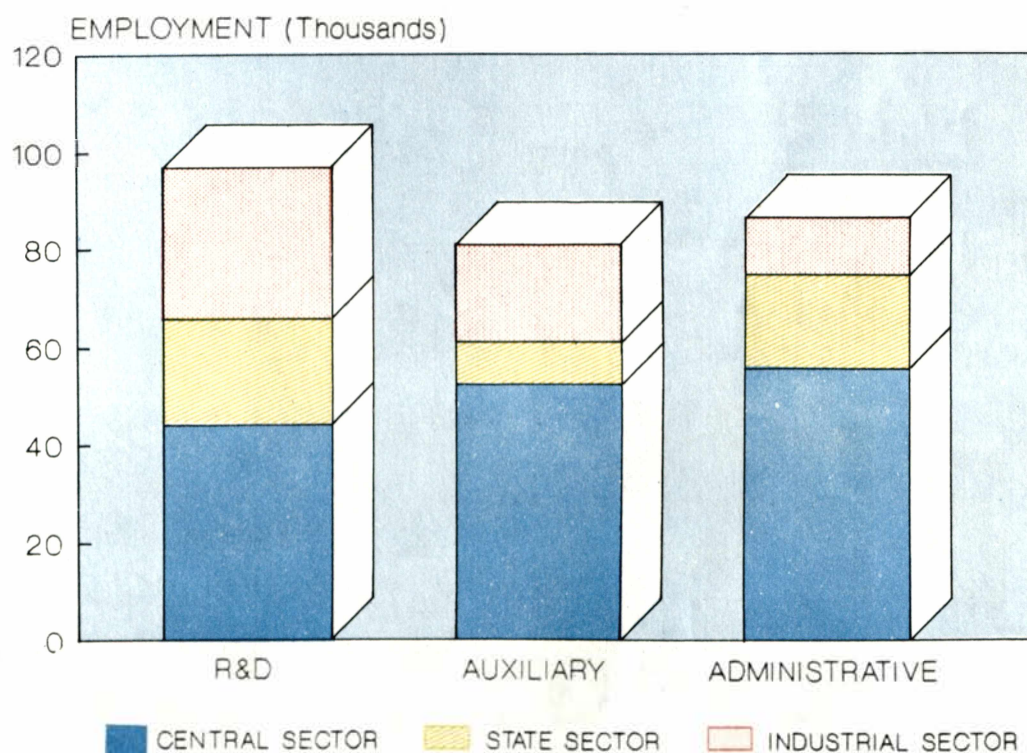
It may be seen from Table 2.4 that the number of auxiliary personnel per R&D personnel varies from 1.06 to 2.14 in the institutional sector whereas in the industrial sector the figures for public and private sectors were of 0.77 and 0.56 respectively. The higher number of auxiliary personnel in the agencies and public sector might be

Table 2.4
NUMBER OF AUXILIARY AND ADMINISTRATIVE PERSONNEL PER R&D PERSONNEL IN 1988-89

Agency	Number of Personnel Per R&D Personnel	
	Auxiliary	Administrative
Atomic Energy	1.06	0.74
CSIR	2.14	0.91
ICAR	1.42	3.87
ICMR	1.41	1.67
Public Sector	0.77	0.41
Private Sector	0.56	0.35
Overall	0.83	0.89

on account of the reason that in the R&D financed by the Government sources, adequate technical support is provided to the R&D personnel whereas in case of private funded research R&D personnel are also being utilised for routine technical jobs. The number of administrative personnel per R&D personnel does not show any consistency. The number of administrative personnel per R&D personnel employed in ICAR is very high. This may presumably be on account of reason that for

EMPLOYMENT BY ACTIVITY AND BY TYPE OF R&D ESTABLISHMENTS AS ON 1ST APRIL, 1988



agricultural experiments, a large number of unskilled personnel are required for field operations. In case of public and private sectors, this figure is quite low. One of the possible reasons for this has already been explained in the preceding paragraphs i.e. the administrative facilities are mostly common to R&D as also to production, sales etc.

Out of 96927 S&T personnel engaged primarily in R&D activities as on 1st April 1988, academic qualifications were available in respect of 71679 i.e. for about 74% of the S&T personnel engaged in R&D activities. Out of these, 45% had engineering and technology background, 29% had natural sciences, 23% agricultural sciences, 2% had medical and rest 1% had social sciences background. According to level of qualifications, 14% were doctorate degree holders, 29% were post graduates, 27% were graduates, 9% were diploma holders and rest 21% were with other qualifications. In natural sciences, 59% had post graduate or above qualifications, 28% had graduate degree and rest 13% had "other" qualifications. It has been observed that a similar trend exists in case of medical and social sciences. In agricultural sciences, 63%

had post graduate or above qualifications, 6% had graduate degree and rest 31% had "other" qualifications. In engineering and technology, 21% had post graduate and above qualifications, 36% had graduate degree, 20% had diploma and rest 23% had "other" qualifications. It may be noted from this analysis that in the field of agricultural sciences, natural sciences, medical sciences and social sciences, there was sizeable proportion of post graduates and doctorates whereas in case of engineering and technology, only 21% were post graduates and above and there was a sizeable proportion of diploma holders (20%).

Out of 96927 personnel primarily engaged in R&D activities, 4893 or 5% were females. Among female R&D personnel, about 14% of them were Ph.Ds, 35% were post graduates, 25% were graduates, 8% were diploma holders and rest 18% were having "other" qualifications. By field of science, it was noted that 37% were from natural sciences, 31% were engineering and technology, 22% were agricultural sciences, 5% were medicine while 4% were with background in social sciences.

Out of 96927 personnel engaged in R&D activities, 65782 personnel were employed in the

R&D MANPOWER BY QUALIFICATIONS AND BY FIELD OF SCIENCE AS ON 1ST APRIL,1988

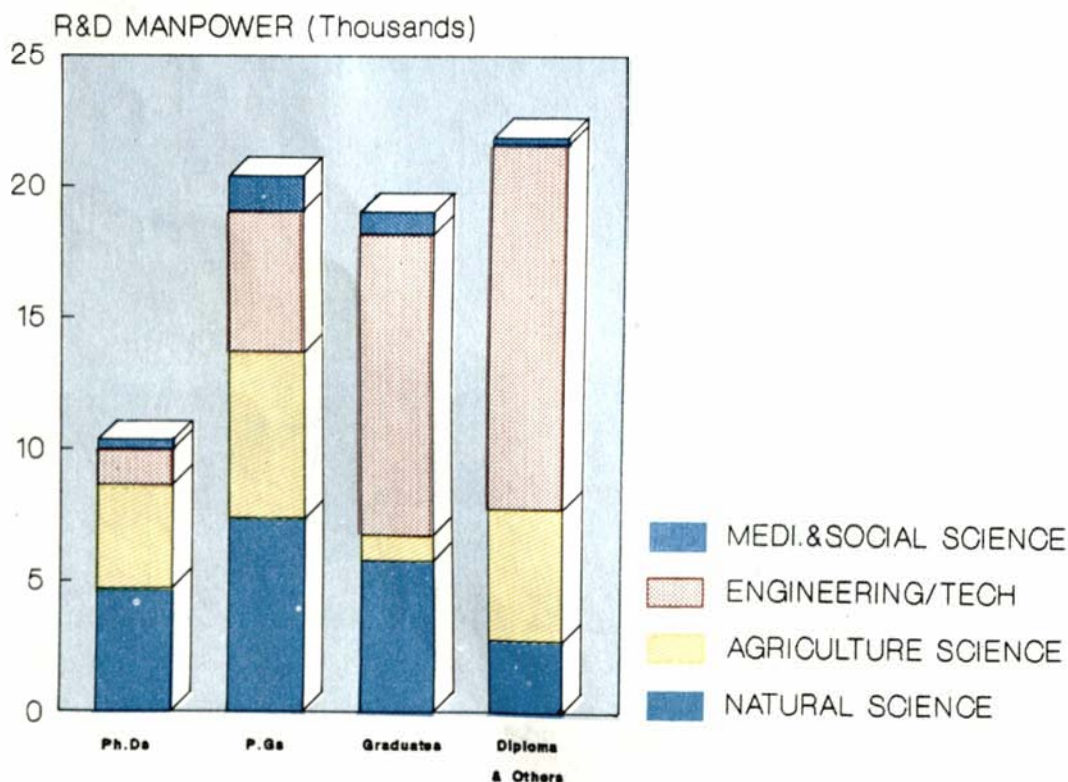


Table 2.5
SALARY STRUCTURE OF S&T PERSONNEL ENGAGED IN R&D IN THE
INSTITUTIONS IN GOVERNMENT SECTOR AS ON 1.4.1988

Salary Scale	Number of Personnel		Total
	Central Government	State Government	
Less than Rs. 1400	3127 (11.3)	5025 (25.5)	8152 (17.2)
Rs. 1400 – Rs. 2600	2899 (10.5)	1127 (5.7)	4026 (8.5)
Rs. 1640 – Rs. 2900	1902 (6.9)	2046 (10.4)	3948 (8.3)
Rs. 2200 – Rs. 4000	7632 (27.6)	6782 (34.5)	14414 (30.5)
Rs. 3000 – Rs. 4500	5936 (21.5)	95 (0.5)	6031 (12.7)
Rs. 3700 – Rs. 5000	3983 (14.4)	3286 (16.7)	7269 (15.4)
Rs. 5100 – Rs. 6300	1781 (6.4)	1318 (6.7)	3099 (6.6)
Rs. 5900 – Rs. 7300	370 (1.3)	1 Neg.	371 (0.8)
Rs. 7300 – Rs. 7600	15 (0.05)	–	15 Neg.
Rs. 7600 and above	6 (0.02)	–	6 Neg.
Total	27651 (100.0)	19680 (100.0)	47331 (100.0)

institutional sector and 31145 were employed in the industrial sector. Information regarding the salary scale were available in respect of 47331 out of the total of 65782 R&D personnel employed in the institutional sector. This information is presented separately for central government and state government institutions in Table 2.5.

It may be noted from Table 2.5 that 56% of total R&D personnel employed in central government were in the scale of Rs. 2200-4000 or less whereas in case of state governments about 76% of R&D personnel were in the scale of Rs. 2200-4000 or less. Both in the central and state governments there were very few personnel in the scale of Rs. 5900-7300 or more. Majority of the R&D personnel were employed in the scale of Rs. 2200-4000 both in case of central and state governments.

In the public sector industry R&D units, information regarding the salary scale of R&D personnel was asked, but it seems from the data that in case

of some of the public sector industries, total emoluments have been indicated instead of pay scales. Therefore, this data should be used with caution. Based on the response, the proportion of S&T personnel engaged in R&D activities in the pay scale upto Rs. 1000 was 12.5%. Almost half of the R&D personnel were in the scale of between Rs. 1000 to Rs. 2000.

There are no well defined scales in private sector industries. Therefore, the information on salary scale were asked and same have been used for analysis of data in this sector. It seems from the data that some of the industries have given total emoluments rather than the pay scales. Therefore, this data should be used with caution. A little less than one third of the personnel were in the scale less than Rs. 2000. About 45% were in the scales between Rs. 2000 to Rs. 4000. A little less than one fourth of personnel were in the pay scales of more than Rs. 4000.

To sum up, the salient features are detailed below :		employed in the inhouse R&D units of public and private sector industries.
– As on 1st April, 1988, 2.68 lakh S&T personnel were employed in R&D establishments.	–	The share of engineers were 45% among total R&D personnel.
– By nature of work 36.2% were engaged in R&D activities, 30.3% were performing auxiliary activities and 32.3% were providing administrative support.	–	43% of total R&D personnel were having post graduate or above qualifications in the fields of natural science, agricultural science, engineering and technology, medical and social science.
– Out of 96927 personnel engaged in R&D activities 65782 were employed in the institutional sector and rest 31145 were	–	About 56% of total R&D personnel employed in Central Government were in the scale of

Rs. 2200 to Rs. 4000 or less whereas in case of state Governments this was about 76%.	were having post graduate or above qualifications.
— 5% of the total R&D personnel were females.	— More than two third of total women R&D personnel were from Natural Sciences or
— Almost half of the women R&D personnel	Engineering background.

CHAPTER III

RESEARCH AND DEVELOPMENT IN THE CENTRAL SECTOR

Realising the need to receive a substantial gain through the application of Science & Technology for the upliftment of the economy, Central (or Federal) Government continued to shoulder the major share of the financial burden of National Research and Development (R&D) expenditures. Its contribution to total R&D expenditure rose from 81.7% in 1986-87 to 82.8% in 1988-89. In actual terms, the total R&D expenditure has increased from Rs. 2039.68 crores in 1986-87 to 2875.11 crores in 1988-89. This expenditure is inclusive of the expenditure incurred by the Central Public Sector Undertakings towards R&D.

With the present trend of share in R&D expenditure by Federal Government, the rate of growth for the years 1986-87, 1987-88 and 1988-89 over the previous year was 25%, 20% and 18% respectively. It may be seen that the annual growth rate is showing a declining trend in the last few years.

Table 3.1
ANNUAL RATE OF GROWTH IN PERCENTAGE

Year	Annual rate of growth	
	At current prices	At constant prices (Base 1980-81)
1981-82	24	13
1982-83	26	17
1983-84	16	7
1984-85	35	26
1985-86	16	8
1986-87	25	15
1987-88	20	10
1988-89	18	10

Sharp rise in annual rate of growth in 1984-85 over 1983-84 may be attributed to the maximum utilisation of the funds of the plan period. The annual growth rate of Central Government R&D expenditure at constant prices of 1980-81 has also shown similar trend.

The Central Government R&D expenditure is divided on the basis of percentage allocation of resources by objectives as laid down by UNESCO for the year 1988-89 and the same is given in Table 3.2.

Table 3.2
**PERCENTAGE SHARE OF FEDERAL R&D EXPENDITURE
BY OBJECTIVES IN 1988-89**

Objective	Percentage
Defence	24.6
Space	15.0
Promotion of Industrial Development	13.9
Development of Agriculture, Forestry and Fishing	9.9
General Advancement of Knowledge	9.7
Production Conservation & Distribution of Energy	8.2
Protection of Environment	5.1
Development of Transport & Communication	4.4
Development of Health Services	3.5
Other aims	6.0
Total	100.0

It is obvious to know that the objectives like Defence, Space, Promotion of Industrial Development, Development of Agriculture Forestry and Fishing had received more allocations of funds for R&D.

Objectivewise percentage share of Central Sector in respective objective's total National R&D expenditure is shown in Table 3.3. It reveals that cent per cent of R&D expenditure over Space, Defence and Development of Education Services were borne by Federal Government.

Table 3.3.
**PERCENTAGE SHARE OF CENTRAL GOVERNMENT IN
RESPECTIVE OBJECTIVE'S TOTAL NATIONAL R&D
EXPENDITURE IN 1988-89**

Objective	Percentage
Space	100.0
Defence	100.0
Development of Education Services	100.0
Protection of Environment	99.9
General Advancement of Knowledge	99.8
Social Development & Other	98.4
Socio-Economic Services	
Exploration and Assessment of Earth, Seas and Atmosphere	98.3
Production Conservation & Distribution of Energy	84.2
Development of Transport & Communication	78.5
Promotion of Industrial Development	67.5
Development of Health Services	65.2
Development of Agriculture, Forestry & Fishing	53.7
Other Aims	93.3
Total	85.5

For the purpose of better understanding of S&T Institutions under Central Government, they are grouped into :

- (a) Major Scientific Agencies — Organisations which have R&D as predominant activity.
- (b) Other Central Ministries/Departments — Organisations which undertake R&D occasionally in connection with their day-to-day problems.

The share of R&D expenditure during 1988-89 by the 12 Major Scientific Agencies out of total Central Sector R&D expenditure was 75.2%. This share was 62.3% in National R&D expenditure. It has risen from Rs. 1593.4 crores in 1986-87 to Rs. 2162.8 crores in 1988-89 for these agencies. Similarly R&D expenditure for other Ministries/Departments showed an upward trend of Rs. 446.3 crores in 1986-87 to Rs. 712.3 crores in 1988-89.

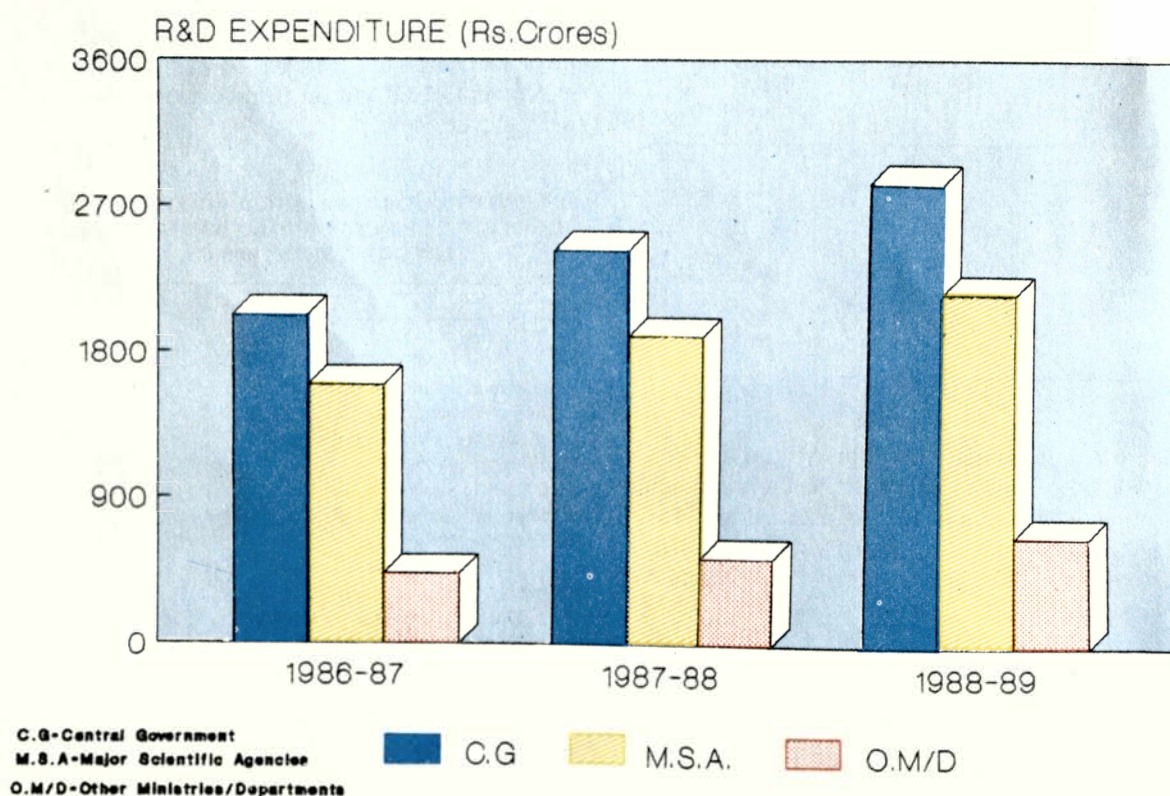
Table 3.4 shows the percentage share of R&D expenditure among Major Scientific Agencies. It is

Table 3.4
PERCENTAGE SHARE OF R&D EXPENDITURE BY
MAJOR SCIENTIFIC AGENCIES IN 1988-89

Agency	Percentage
Defence Research & Development Organisation	26.7
Department of Space	20.0
Department of Atomic Energy	14.0
Council of Scientific & Industrial Research	9.8
Indian Council of Agricultural Research	9.3
Department of Science & Technology	7.2
Department of Environment	6.8
Others	6.2
Total	100.0

In all, there are 14 Cooperative Research Associations representing different industry such as textiles, plywood, rubber, automotive, electrical and cement. The R&D expenditure incurred by

CENTRAL GOVERNMENT R&D EXPENDITURE BY MAJOR SCIENTIFIC AGENCIES AND OTHER MINISTRIES/DEPARTMENTS



these Associations had increased from Rs. 24.7 crores in 1986-87 to Rs. 35.5 crores in 1988-89.

As far as the R&D expenditure by field of science is concerned, the percentage share in 1988-89 was 43.9, 38.8, 13.3 and 4.0 by Natural Sciences, Engineering and Technology, Agricultural Sciences and Medical Sciences respectively.

With regard to the Manpower employed in R&D establishments of Central Government, as on 1st April, 1988, there were 1,82,799 personnel which was 68% of total national manpower employed in all R&D units. The above figure was inclusive of 27,611 personnel employed in R&D units of Public Sector Undertakings.

Out of the total 1,82,799 personnel, 56,579 personnel were primarily engaged in R&D activities which consists of 43,927 R&D personnel in institutional sector and 12,652 personnel from Public Sector Undertakings. Professional status of 3335 personnel working in institutional sector were not known. The percentage ratio of total Federal manpower according to type of work was 31.5 in R&D, 34.6 in auxiliary and 33.9 in administrative activities. It is interesting to note that the percentage ratio of R&D personnel is comparatively lower among the three.

Since data on the field of specialisation and qualification of personnel engaged primarily in the R&D activities of industrial sector is discussed separately in Chapter-V, the analysis in the ensuing

paragraph is restricted to the personnel working in institutional sector under Central Government.

Field of specialisation and qualification were known only to about 0.26 lakh of personnel engaged primarily in R&D activities of institutional sector of Central Government, which was 59% of their total strength. By field of specialisation, Natural Scientists shared 44.5% followed by Engineers 39.2%, Agricultural Scientists 9.9%, Medical Personnel 3.6% and Social Scientists 2.8%. By level of qualification, they were comprised of 20.5% of Ph.Ds, 32.6% of Post Graduates, 25.3% of Graduates and 21.6% of Diploma Holders and "other" qualifications. Natural Scientists continued to dominate among the R&D personnel of institutional sector of Federal Government and the analysis of their educational qualification as given in Table 3.5 reveals that 67% of them had Post Graduate and above qualification.

Table 3.5
DISTRIBUTION OF R&D PERSONNEL IN NATURAL SCIENCES BY LEVEL OF QUALIFICATION IN CENTRAL SECTOR AS ON 1.4.1988

Qualification	Percentage
Ph.D	27.8
Post Graduate	39.2
Graduate	22.6
Other	10.4
Total	100.0

To sum-up the salient features of R&D input in Central Government are as under :

- Central Government continued to shoulder 82.8% of National R&D expenditure during 1988-89.
- In absolute terms, Central Government incurred Rs.2875.11 crores on R&D in 1988-89.
- Annual rate of growth for 1988-89 over the previous year was 18%. The same in constant prices (Base 1980-81) was 10%.
- Annual rate of growth of Central R&D expenditure during the 7th Plan period shows a declining trend.
- By Socio-economic objectives of UNESCO, the

Defence R&D accounted for little more than one fourth of Federal R&D expenditure.

- Cent percent of R&D expenditure on Space, Defence and Development of Education Services was borne by Centre.
- 75.2% was the share of R&D expenditure by Major Scientific Agencies out of Federal Source.
- About 1.8 lakh personnel were engaged in R&D units in the institutional and public sector industry of Central Sector out of which 31.5% were engaged in primarily R&D, 34.6% auxiliary and 33.9% administrative activities.
- Natural Scientists dominated the institutional R&D Manpower (44.5%) and 67% of them possessed Post Graduate and above qualification.

CHAPTER IV

R&D IN THE STATE SECTOR

This chapter analyses resources devoted to R&D activities by State Governments.

The total R&D expenditure incurred by the States has increased from Rs. 12.58 crores in 1970-71 to Rs. 59.34 crores in 1980-81 and further to Rs. 232.91 crores in 1988-89, which is equivalent to 6.7% of national R&D expenditure. It is expected to be of the order of Rs. 260.86 crores in 1989-90. The annual growth rate was 35% in 1982-83, 24% in 1983-84, 5% in 1984-85, 1% in 1986-87 and 27% in 1988-89 over the respective previous years.

Out of the total S&T expenditure of Rs. 289.55 crores incurred in 1988-89, 80.4% was incurred on R&D activities. The expenditure by type of work i.e. Basic Research, Applied Research and Experimental Development, are given in Table 4.1.

6.7% of the National R&D expenditure was incurred by the State Governments during the year 1988-89. The R&D expenditure in the States con-

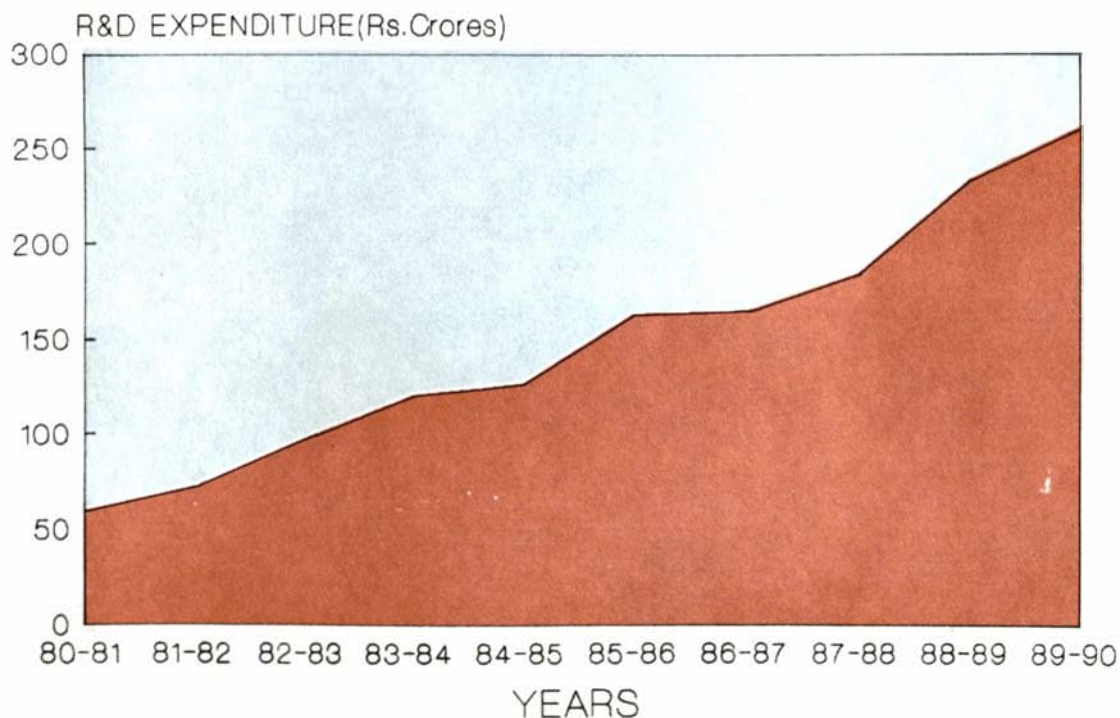
Table 4.1
PERCENTAGE OF R&D EXPENDITURE BY TYPE OF WORK

Years	R&D Expenditure by type of work			
	Basic Research	Applied Research	Experimental Development	R&D Expenditure in Total S&T Expenditure
1978-79	12.3	68.2	19.5	78.4
1980-81	10.3	64.4	25.3	77.7
1982-83	14.1	56.3	29.6	79.9
1984-85	17.4	43.6	39.0	74.7
1986-87	11.0	65.3	23.7	78.9
1988-89	10.7	66.7	22.6	80.4

stitute only a mere of 0.07% of GNP during 1988-89.

Statewise percentage distribution of R&D expenditure are given in Table 4.2.

GROWTH OF R&D EXPENDITURE IN STATE SECTOR



Estimated

Table 4.2
PERCENTAGE DISTRIBUTION OF R&D EXPENDITURE
BY VARIOUS STATES IN 1988-89

State	Percentage
Andhra Pradesh	7.4
Assam	1.8
Bihar	4.2
Gujarat	6.9
Haryana	2.4
Himachal Pradesh	2.8
Jammu & Kashmir	0.9
Karnataka	8.1
Kerala	6.6
Madhya Pradesh	5.3
Maharashtra	18.4
Orissa	1.2
Punjab	12.0
Rajasthan	6.0
Tamil Nadu	6.5
Uttar Pradesh	8.5
West Bengal	1.0
Total	100.0

From Table 4.2, one can see that out of the total R&D expenditure of Rs. 232.91 crores in 1988-89, about 54% was accounted by the states of Maharashtra, Punjab, U.P., Karnataka and Andhra Pradesh in that order. The States like Arunachal

Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, Goa, Sikkim and Union Territories do not seem to have incurred any R&D expenditure during the year 1988-89 and so these states are not listed in the Table.

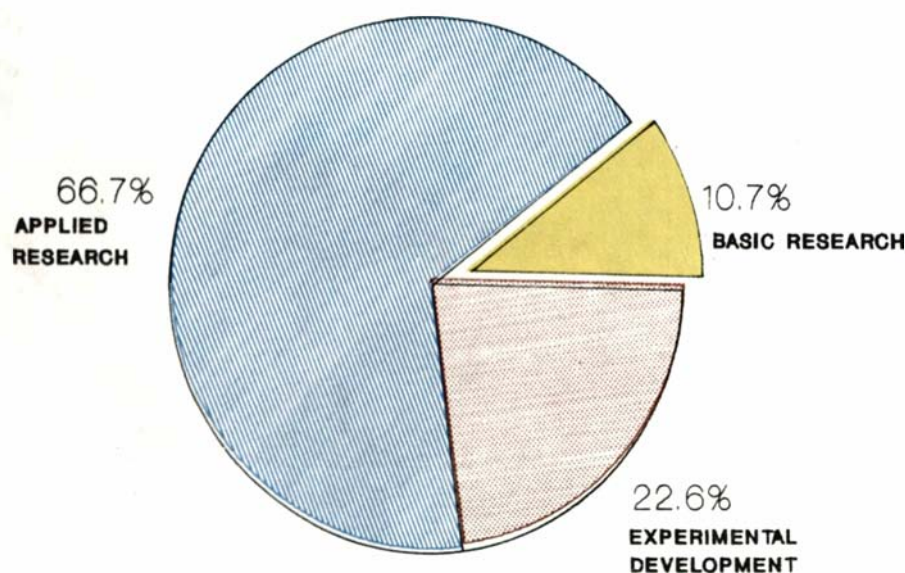
The expenditure incurred by the State Governments on R&D has been broken down into 13 objectives as defined by the UNESCO. Accordingly R&D expenditure by major objectives for the year 1988-89 are given in Table 4.3.

Table 4.3
PERCENTAGE DISTRIBUTION OF R&D EXPENDITURE
BY VARIOUS OBJECTIVES DURING 1988-89

Objective	Percentage
Development of Agriculture, Forestry and Fishing	97.6
Promotion of Industrial Development	1.1
Exploration and Assessment of Earth, Seas and Atmosphere	0.6
Development of Health Services	0.3
Others	0.4
Total	100.0

It may be seen that development of agriculture and related areas is the major objective of the R&D activities in the state sector.

SHARE OF R&D EXPENDITURE BY TYPE OF RESEARCH IN THE STATE SECTOR 1988-89



By field of science, the R&D expenditure in state sector again mostly is concentrated in Agricultural Sciences as may be seen from Table 4.4.

Table 4.4
PERCENTAGE DISTRIBUTION OF R&D EXPENDITURE
BY FIELD OF SCIENCE DURING 1988-89

Field of Science	Percentage
Agricultural Sciences	93.3
Engineering & Technology	4.8
Natural Sciences	1.6
Medical Sciences	0.3
Total	100.0

Though the response to providing data on R&D Manpower employed in research institutions in state sector is not encouraging, efforts were made to estimate the same in addition to the data received from the institutions. Data on the manpower employed in the institutions are discussed in the following lines. The total personnel employed in R&D institutions in the states was 49,502 as on 1st April 1988 and out of this, about 44.2%, 17.4% and 38.4% were employed respectively in R&D, auxiliary and administrative activities. In all 21,855 personnel were reported to be employed in R&D activities, but the educational background was available with respect to only 14,923 personnel. 89.4% of them were from Agricultural Sciences, 5.0% from Natural Sciences, 3.3% from Engineering and Technology and the rest from Medical and Social Sciences. Since the majority of S&T personnel employed in R&D activities are from the Agricultural Sciences, an analysis has been attempted regarding their qualifications as presented in Table 4.5.

It may be seen from the Table 4.5 that about 60% of R&D personnel in the field of agricultural sciences had post graduate and higher degrees. It may be mentioned that most of them are employed

Table 4.5
EDUCATIONAL QUALIFICATION OF S&T PERSONNEL
IN THE FIELD OF AGRICULTURAL SCIENCES

Qualification	Percentage
Ph.D.	20.2
Post-Graduate	39.2
Graduate	5.4
Others	35.2
Total	100.0

in agricultural universities and their regional centres and it is quite possible that they do both teaching and research functions.

In all there were 3,506 women personnel employed in the state R&D institutions and out of which 1,230 females were engaged primarily in R&D activities.

From the Degree Holders and Technical Personnel Survey of 1981, it was observed that there were five S&T personnel per 10 sq.km. of area in the country. The national average was exceeded by a number of states and some of them were as follows with their S&T personnel density (defined as S&T personnel per 10 sq.km.) given in bracket :

Kerala (38); Delhi (360); Lakshadweep (65); Pondicherry (48); Chandigarh (755); West Bengal (15); Goa, Daman and Diu (17); Tamil Nadu (12). Since density of S&T personnel of a state depends on the area of that state, it is useful to highlight the absolute number of S&T personnel in different states. Out of the total of 1.6 million S&T personnel surveyed for India, Maharashtra accounted for 14.1%, UP 11.0%, Tamil Nadu 9.7%, Karnataka 9.4%, Kerala 9.1%, West Bengal 8.3% and Bihar 6.7%. These states accounted more than two third of the total S&T personnel of the country.

To sum up, the salient features of the R&D scene in the State Sector are as under :

- State Sector spent Rs. 289.55 crores on scientific and technological activities with 80.4% of it for R&D activities and 19.6% for other related S&T activities.
- State Sector accounted for only 6.7% of National R&D expenditure and 0.07% of Gross National Product during 1988-89.

- R&D activities were concentrated in few States only and North-Eastern States are still seem to have no R&D activities.
- Agriculture was the major field of research in the States.
- There were about 21,855 personnel engaged directly in R&D activities from state sector.
- 5.6% of the state R&D manpower were females.

CHAPTER V

R&D IN INDUSTRIAL SECTOR

R&D is an essential facet of any industrial activity especially, in the wake of growing competition. Financial and human resources devoted to industrial R&D activities represent the principal input to R&D and can be used as indicators of the commitment of industry to innovation. It is a well known fact that the research and development in industries is essential for generating know-how necessary for production of quality products, promoting efficiency, promoting exports and technological self reliance needed in the country as well as absorption, adaptation, and upgradation of imported knowhow. The Government of India has been encouraging industrial units to take up R&D activities by paying special attention required for promotion and support of R&D.

A scheme for granting recognition to inhouse R&D units in industrial sector and private and public funded research and development laboratories was being operated by the Department of Science and Technology from 1973. This activity is now being dealt by the Department of Scientific and Industrial Research. One of the objectives of this scheme is to provide liberalised import facilities to recognised R&D units for purchase of equipments, components, raw materials etc., necessary for carrying out research and development work. These incentives have encouraged industrial R&D units to establish their in-house R&D centres.

Industries in India comprises of public sector industries (both central and state) and private sector industries. Public sector together with private sector is called as industrial sector for convenience. As on 1st September, 1988 about 1016 industrial units were recognised by Department of Scientific and Industrial Research. Out of this 895 industries were in the private sector and rest 121 in the public/joint sector. These industries were surveyed by mail card enquiry to provide data on their R&D activities. Requisite information in the questionnaire specially designed for this survey has been received from 828 private sector R&D units, 121 public/joint sector R&D units and the R&D expenditure for the rest 67 in house R&D units of private sector have been projected to arrive at the total private sector R&D expenditure. However, detailed analyses of data in respect of R&D expenditure by industry groups, and by R&D manpower are based

on the actual data received from 828 private sector and 121 public/joint sector respondents.

Industrial sector investment on research and development activities attained a level of Rs. 725.11 crores at current prices for the year 1988-89. This constitutes 20.9% of the total national R&D expenditure. This has increased from Rs. 527.33 crores in 1986-87 to Rs. 598.74 crores in 1987-88 and to Rs. 725.11 crores in 1988-89 representing an increase of 13.5% and 21.1% respectively. Based on the growth in the number of R&D units and the past trend, the R&D expenditure projected for the year 1989-90 was of the order of Rs. 852.07 crores. The industrial sector investment on R&D for the year 1988-89 worked out to be 0.21% of the Gross National Product at current prices. The R&D expenditure as percentage of sales turnover for industrial sector worked out to be 0.72% for the year 1988-89.

During the year 1988-89, 49.8% of total industrial sector investment was by 121 public/joint sector industries and rest 50.2% was by 895 private sector inhouse R&D units. On the same basis the share for 1987-88 for public sector was 48.2% and rest 51.8% was for private sector and the share worked out to be 44.7% for public sector and 55.3% for private sector for 1986-87.

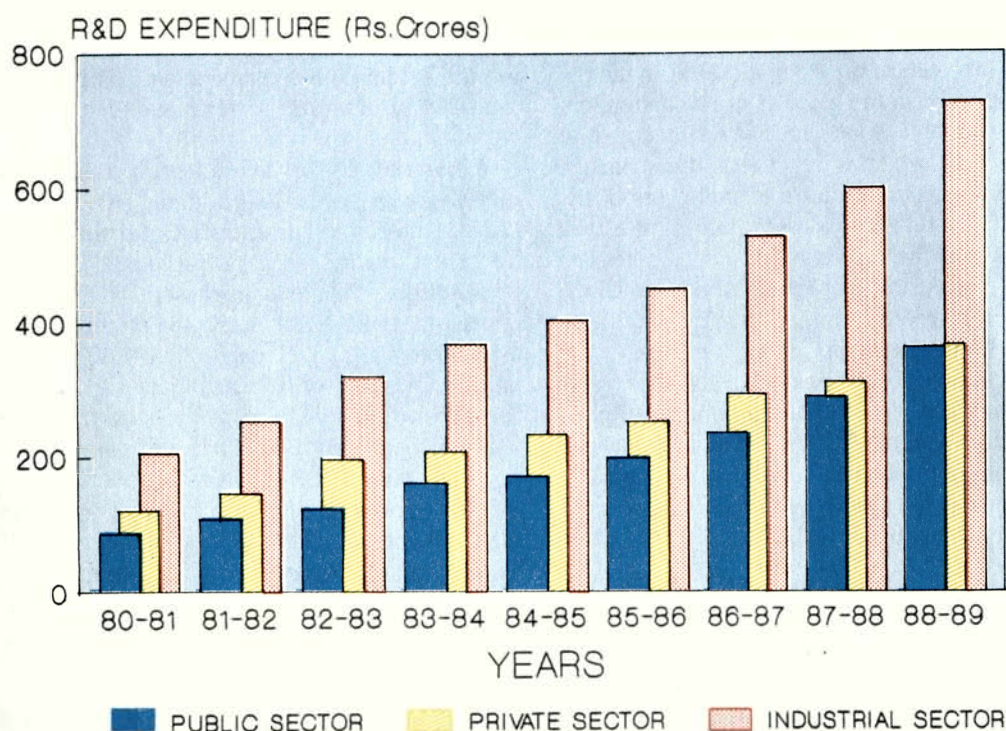
Table 5.1 gives the investment on R&D and number of inhouse R&D units for public sector, private sector and industrial sector as a whole for three years duration.

Table 5.1
R&D EXPENDITURE BY PUBLIC, PRIVATE AND INDUSTRIAL SECTOR

Sector	No. of Units	R&D Expenditure (Rs. Crores)		
		1986-87	1987-88	1988-89
Public Sector	121	235.70	288.47	361.32
Private Sector	895	291.63	310.27	363.79
Industrial Sector	1016	527.33	598.74	725.11

It may be seen from Table 5.1 that 55.3% of the total industrial sector investment on R&D was by 88% of private sector inhouse R&D units whereas rest 44.7% was invested by 12% of public/joint sector R&D units during 1986-87. The share of private

GROWTH OF INDUSTRIAL SECTOR R&D EXPENDITURE



sector has decreased to 50.2% and the share of public sector has increased to 49.8% in 1988-89 with the share of number of private and public sector R&D Units remaining the same as in 1986-87. It may be interesting to note that though the number of R&D units for public and private sectors were kept constant for the duration of three years the share of public sector R&D investment has been growing in the total industrial sector investment. This indicates that the pace of spending on R&D activities by public sector was higher than private sector during the three years under study. It may also be seen from this Table that per unit R&D expenditure for private and public sector were quite variant which were Rs. 0.41 crores and Rs. 2.98 crores respectively during 1988-89. The variation between the two sets of figures may be attributed to the big size of the companies in public sector and their need for complex and sophisticated technology calling for higher investment on R&D whereas private sector R&D units were heterogeneous in size which even included small scale industries spending very little on R&D.

It is known that industries are profit oriented and the investment by industries is to a large extent conditioned by the financial benefits accru-

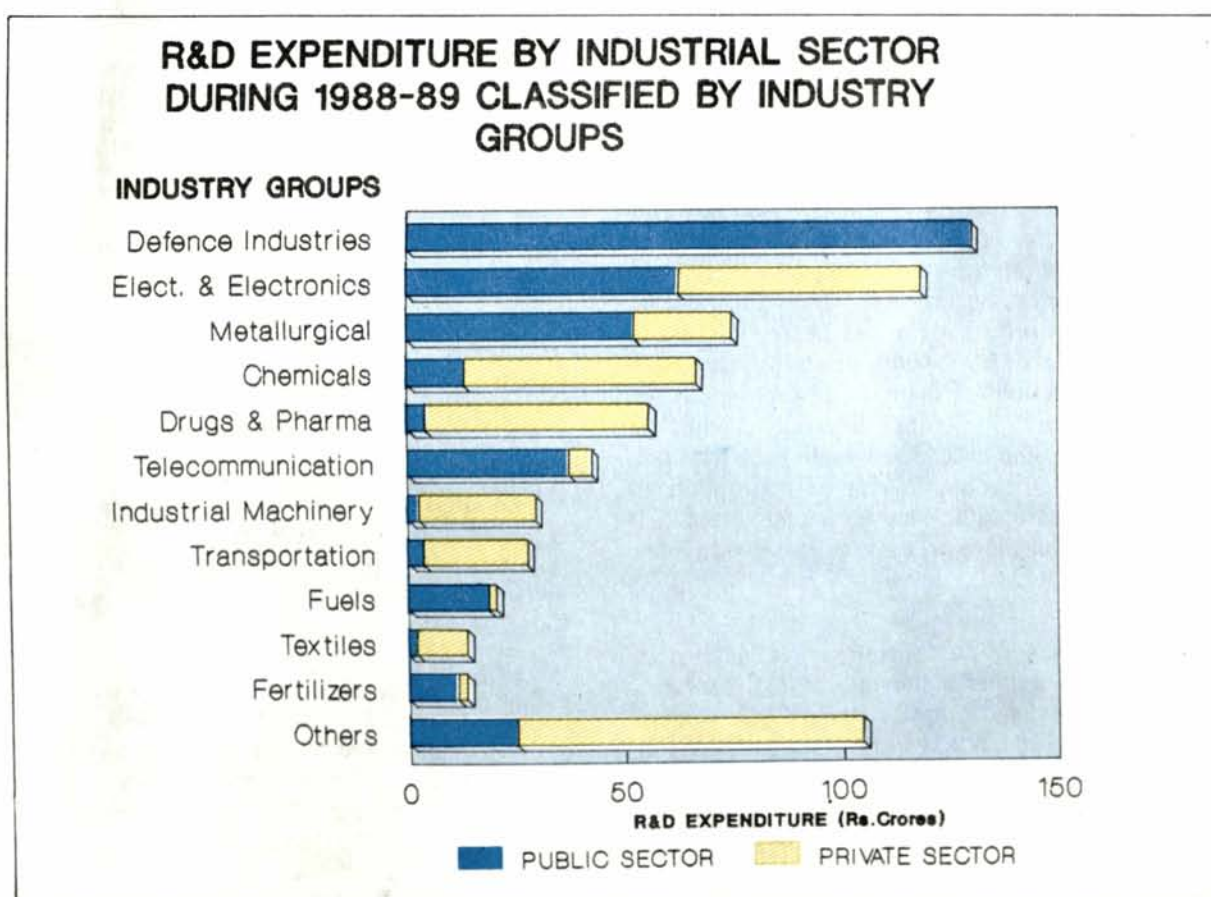
ing to them by way of increase in production, sales and reduction in the cost of production etc. The investment on advertisement also aims at increasing sales. Therefore, the information on R&D expenditure as percentage of sales turnover, advertising expenditure as percentage of sales turnover and expenditure on purchase of new plant and machinery and its percentage share in sales turnover were compiled to assess the relative importance given by the industries to R&D, advertising and purchase of new plant and machinery. Investment on R&D as percentage of sales turnover for industrial sector works out to be 0.72% for the year 1988-89. For the private and public sector the figures were 0.62% and 0.77% respectively. It may not be out of place to mention here that this ratio for a number of developed countries of the world varies between 3% to 4%. The advertising expenditure as percentage of sales turnover for industrial sector worked out to be 0.31% for the year 1988-89. For the private and public sector separately, the figures were 0.53% and 0.06% respectively. It may be seen that this ratio is quite less than the R&D expenditure as percentage of sales turnover ratio for the year 1988-89 for private, public and industrial sector. The investment on purchase of new plant and equipment as percentage of sales tur-

Table 5.2
R&D EXPENDITURE BY INDUSTRIAL SECTOR 1988-89 CLASSIFIED BY SECTOR

Industry Group	Public Sector		Private Sector		Industrial Sector	
	No. of Units	R&D Exp. (Rs. Lakhs)	No. of Units	R&D Exp. (Rs. Lakhs)	No. of Units	R&D Exp. (Rs. Lakhs)
Defence Industries	8	12970.30	—	—	8	12970.30
Electricals & Electronics	21	6225.01	146	5577.50	167	11802.51
Metallurgical Industries	24	5229.45	56	2263.64	80	7493.09
Chemicals (Other than Fertilizers)	6	1327.99	156	5336.61	162	6664.60
Drugs & Pharmaceuticals	6	422.96	78	5177.49	84	5600.45
Telecommunication	12	3717.15	32	548.32	44	4265.47
Industrial Machinery	7	245.32	79	2720.72	86	2966.04
Transportation	4	354.34	35	2419.25	39	2773.59
Fuels	5	1873.71	8	168.05	13	2041.76
Textiles	2	162.20	27	1213.64	29	1375.84
Fertilizers	6	1142.17	2	223.60	8	1365.77
Other Groups	20	2460.96	209	8006.45	229	10467.41
Total	121	36131.56	828	33655.27	949	69786.83

never was 2.90% for industrial sector during 1988-89. It appears from the data and analysis that industry have higher priority for investment on R&D as compared to advertising, but less priority than the purchase of new plant and equipment.

The total R&D expenditure of industrial, private and public sectors were apportioned into 38 industrial groups on the basis of the products manufactured by them. Out of 38 industrial groups identified, 11 leading industry groups arranged in



descending order of their expenditure spent 85% of total industrial sector R&D expenditure in 1988-89. Table 5.2 gives information on the number of R&D units and total R&D expenditure in each group separately for public, private and industrial sector during 1988-89.

It may be seen from Table 5.2 that a little more than one fourth of total industrial sector R&D units which belonged to Defence, Electricals & Electronics and Metallurgical group accounted for about 46.2% of the total industrial sector R&D expenditures. In public sector these three groups accounted for 43.8% of total public sector industries and 67.6% of total public sector R&D expenditure. About 41.5% of total public sector industries which fall under Electricals and Electronics, Metallurgical, Drugs and Pharmaceuticals, Transportation, Textiles and Fertilizers group accounted for 50.1% of total private sector R&D expenditure.

It may be interesting to note from this Table that variation in size of R&D investment was quite high between different industry groups. It may also be observed that the heterogeneity in the size of R&D expenditure for different industry groups between public and private sector was also quite significant. The per unit R&D expenditure was maximum for defence industries i.e. Rs. 1621.28 lakhs and all of these industries were under public sector. The R&D expenditure for the group Electricals and Electronics was next to Defence Industries for industrial sector as a whole as well as for private and public sector industries separately. But per unit R&D expenditure of this group when compared to Fertilisers and Metallurgical industries was quite low for industrial sector as a whole. This is also true in case of private sector industries. The reason for low per unit R&D expenditure in private sector in chemicals (other than fertilisers) industrial machinery and telecommunication may be attributed to some of the small scale industries falling under these groups. It may be appropriate to conclude from Table 5.2 that industrial sector R&D expenditure was more or less concentrated in a few areas.

The quantum of S&T manpower employed in R&D units is another major indicator of country's R&D efforts. As on 1st April, 1988, 62926 personnel were employed in 951 units of industrial sector inhouse R&D units which works out to be 23.5% of total personnel employed in R&D establishments in the country. This figure comprises of both full time and full time equivalent of personnel employed on part time basis. Out of the total industrial R&D

employment, 35315 were employed in 828 private sector industries and rest 27611 were employed in 123 public/joint sector industries. In terms of percentage this works out to be 56% and 44% in private and public sector respectively.

The S&T personnel employed in the inhouse R&D units of industrial sector were either engaged in research and development work or were extending technical support for research and development (called auxiliary personnel) or provided administrative support for research activities. Information in this context may be seen from Table 5.3 which gives number of personnel by type of work for public, private and industrial sector separately. In case of private sector, data for administrative personnel were not available for a large number of industries and in case of public sector, data for auxiliary and administrative personnel were not available. Therefore, data of the previous survey have been used. It may be indicated here that the classification of total R&D personnel into three categories is not easy for many R&D units and therefore this data may be considered only an order of magnitude.

Table 5.3
CLASSIFICATION OF R&D PERSONNEL BY TYPE OF WORK

Category	Public Sector	Private Sector	Industrial Sector
R&D	12652	18493	31145
Auxiliary	9747*	10323	20070
Administrative	5212*	6499*	11711
Total	27611	35315	62926

* Figures of 1984-85 survey repeated.

It may be seen from Table 5.3 that for every 100 personnel employed in industrial sector 49 were engaged in research, 32 extended technical support for performing the R&D work and 19 provided administrative support. In private sector 53 out of every hundred personnel were engaged in research, 29 provided technical support and 18 provided administrative support and for public sector employment, the share of these categories was 46, 35 and 19 respectively.

As on 1st April, 1988 the total number of R&D personnel employed in 951 industrial sector R&D units was estimated at 31145 which works out to be 32% of total R&D personnel at national level. For private sector this figure was estimated at 18493 and for public sector it was estimated at 12652. About 4893 female R&D personnel were employed in all the R&D establishments in the

country. Out of this, 31.4% (1535 personnel) were employed in industrial sector.

Table 5.4 provides information on the total number of R&D personnel employed in public, private and industrial sector by disciplines. Out of 31145 R&D personnel employed in industrial sector, information regarding classification by discipline was available for 30888.

Table 5.4
DISTRIBUTION OF R&D PERSONNEL IN THE INDUSTRIAL SECTOR BY FIELD OF SPECIALISATION

Discipline	Public Sector	Private Sector	Industrial Sector
Natural Sciences	2025	6329	8354
Agricultural Sciences	34	365	399
Engineering and Technology	10435	11006	21441
Medical Sciences	14	387	401
Social Sciences	89	204	293
Total	12597	18291	30888

It may be seen from Table 5.4 that the discipline of Engineering and Technology dominate over all other disciplines in industrial sector as a whole as well as in the public and private sector separately which accounted for 69.4%, 82.8% and 60.2% respectively. Next to this comes natural sciences which accounted for 27.0%, 16.1% and 35.0% respectively. It may be appropriate to conclude from the above analysis that R&D in the industrial sector was more stressed towards the applied sciences.

Table 5.5 provides information on the number of R&D personnel by level of qualifications for public, private and industrial sector. Classification by level

Table 5.5
QUALIFICATION MIX OF R&D PERSONNEL IN THE INDUSTRIAL SECTOR

Sector	Qualification				
	Ph.D	Post Graduate	Graduate	Diploma & Others	Total
Public Sector	680	2089	4230	5598	12597
Private Sector	1368	3965	7173	5785	18291
Industrial Sector	2048	6054	11403	11383	30888

of qualifications were not available for all R&D personnel.

It may be seen from Table 5.5. that out of 30888 R&D personnel employed in industrial sector whose level of qualifications were known, 6.6% were having Ph.D degree, 19.6% were having post graduate degree, 36.9% were having graduate degree and equal number were having diploma or other qualifications in natural science, agricultural, engineering, medical and social sciences. By private and public sector separately, the proportion of Ph.Ds, post graduates and graduates were more in private sector when compared to public sector whereas the proportion of diploma and other qualifications was more in case of public sector.

Out of 31145 R&D personnel employed in the industrial sector information about salary scales were available in respect of 29078, i.e. about 93.4%.

The relevant Tables containing data on salary scales in respect of public and private sector are given at the end and these may be referred appropriately. There are no well defined salary scales available for private sector industries and so it is difficult to compare salaries of public and private sector industries. In order to make it comparable, the industries were approached to provide information in the salary scales provided by the department in the questionnaire. The scales were made uniform by keeping a difference of Rs. 1000 between each scale. However, in some cases it is seen that the information provided by both public and private sector industries indicate total emoluments rather than salary scales. Therefore, the data provided at the end may be used with caution. Some of the interesting points emerging out of the analyses are given in the ensuing paragraph.

Almost half of the R&D personnel employed in public sector were in the scale between Rs. 1000 to Rs. 2000. Only 12.5% of total R&D personnel in public sector were in the scales less than Rs. 1000. In case of private sector a little less than one third of total R&D personnel were in the scales upto Rs. 2000. About 45% were in the scales between Rs. 2000 to Rs. 4000. A little less than one fourth of total R&D personnel were in the pay scales of more than Rs. 4000.

To sum up, the salient features are detailed below :	
— Industrial sector investment on R&D attained a level of Rs. 725.11 crores at current prices during 1988-89 and out of this ₹0.2% was invested by private sector.	— About 62926 S&T personnel were employed in industrial sector out of which 31145 were engaged in R&D activities.
— Industrial sector accounts for 20.9% of the total investment on research and development in the country during 1988-89.	— As on 1st April, 1988, 31145 R&D personnel were employed in 951 industrial sector R&D units which was 32% of total R&D personnel employed in the R&D establishments in the country. Out of this 59.4% were employed in private sector and rest 40.6% were employed in public sector.
— Industry spent 0.21% of Gross National Product on R&D during 1988-89.	
— Industrial sector devoted 0.72% of their sales turnover on R&D during 1988-89.	— Engineering personnel accounted for 69.4% of total industrial sector R&D personnel.
— A little more than one fourth of the total industrial sector R&D units which belonged to Defence, Electricals and Electronics and Metallurgical group accounted for about 46.2% of the total industrial sector R&D expenditure.	— For every 1000 R&D employees in industrial sector 49 were female employees. — A little more than one fourth of total industrial sector personnel primarily engaged on R&D activities were having post graduate or above qualifications.

CHAPTER VI

HIGHER EDUCATION AND SCIENTIFIC RESEARCH

University Grants Commission (UGC) which was established in 1956, under an Act of Parliament is expected to share the major responsibility of regulating the standard in higher education sector of the country. It has been moderating the growth of higher education as well as the establishment of new universities and colleges, so as to ensure that higher education grows in response to the needs of society for trained manpower with appropriate levels of professional training, skills and specialisations or general educational attainments.

After the introduction of new National Policy on Education (NPE) in 1986, following are some of the areas given more priority by the Commission towards the improvement of higher education : Autonomous colleges, Redesigning of Courses, State Councils of Higher Education, Accreditation and Assessment Councils, Alternative Models of Management in Universities, National Qualifying Test for recruitment of teachers, Making Research and Development broad-based, Training/Orientation of teachers, Improvement of Efficiency, Youth and Sports and Education for the Minorities, Scheduled Castes/Scheduled Tribes, Handicapped and Women.

UGC has been spending appreciable sum for meeting various expenditures of Plan and Non-Plan activities. During 1987-88 Commission had spent Rs. 33,450 lakhs. Following paragraphs highlight the efforts putforth in higher education of Science and Technology.

Data on enrolment of students in institutions of higher education can be used as one of the parameters to assess the growth of qualified manpower in the country. Accordingly the data in higher education in universities/colleges as shown on Table 6.1 reveals that as against the enrolment of 26.18 lakh students in 118 universities/deemed universities with 4460 colleges in the year 1978-79, there were 38.14 lakh students were enrolled in as many as 164 universities/deemed universities with 6597 colleges in 1987-88, so, over a decade, the enrolment has grown at a modest rate of 3.8%. Including institutions of national importance which enjoy university status the number of universities as of 1987-88 was 174.

Table 6.2 shows the growth of enrolment in facultywise higher education from 1983-84 to

Table 6.1
GROWTH OF UNIVERSITIES/DEEMED UNIVERSITIES/
COLLEGES AND ENROLMENT

Year	Universities	Deemed Universities	Colleges	Total Enrolment
1977-78	105	10	4375	25,64,972
1978-79	108	10	4460	26,18,228
1979-80	108	10	4558	26,48,579
1980-81	112	11	4722	27,52,437
1981-82	118	11	4880	29,52,066
1982-83	120	13	5039	31,33,093
1983-84	124	13	5246	33,22,939
1984-85	125	15	5590	34,04,096
1985-86	132	15	5816	35,70,897
1986-87	136	17	6512	36,81,870
1987-88	142	22	6597	38,14,417

1987-88. It is worth noting that though there was increase in enrolment in absolute terms, the percentage share of S&T faculties in total did not show much difference. Also, the percentage enrolment was almost static between S&T and "other" faculties with 29.5 and 70.5 during this period.

There has been remarkable growth in the number of women enrolled in institutions of higher education from 0.4 lakh in 1950-51 to 11.95 lakhs in 1987-88. Data on Table 6.3 shows that their percentage share in total enrolment has gone up from 28.5 in 1983-84 to 31.3 in 1987-88. In absolute terms, their number in S&T faculties increased from 2.39 lakhs in 1983-84 to 3.04 lakhs in 1987-88, which is 7.3% to 7.9% respectively of women enrolment for these years. It is worth to note that 80% of women enrolled in S&T faculties belonged to pure science and 14% from Medicine during 1987-88.

At this juncture, it will be worth to analyse the data on outturn of scientific and technical personnel from the institutions of higher education in the country. The data in Table 6.4 reveals that outturn of S&T personnel has increased from 1,77,154 in 1974 to 1,88,288 in 1984. The percentage share of outturn of S&T personnel in Natural Sciences has decreased by 10% between 1974 to 1984, whereas during the same period the other fields such as engineering and technology, medicine, agriculture has shown an upward trend. The data and analysis on their qualification have shown that except for the graduates of Natural Sciences, the number of persons by level of qualifications in

Table 6.2
GROWTH OF ENROLMENT IN HIGHER EDUCATION BY VARIOUS FACULTIES

(in thousands)

Faculty	1983-84		1984-85		1985-86		1986-87		1987-88	
	Number	%	Number	%	Number	%	Number	%	Number	%
Science	653	19.7	670	19.7	705	19.7	725	19.7	751	19.7
Engg. & Tech.	153	4.6	159	4.7	164	4.6	169	4.6	176	4.6
Medicine	119	3.6	119	3.5	129	3.6	133	3.6	137	3.5
Agriculture	42	1.3	42	1.2	46	1.3	48	1.3	50	1.3
Vet. Science	9	0.3	9	0.3	11	0.3	11	0.3	11	0.3
Other	2332	70.5	2405	70.6	2516	70.5	2596	70.5	2689	70.5
Total	3308	100.0	3404	100.0	3571	100.0	3682	100.0	3814	100.0

Table 6.3
FACULTYWISE GROWTH OF WOMEN ENROLMENT IN HIGHER EDUCATION

(in thousands)

Faculty	1983-84		1984-85		1985-86		1986-87		1987-88	
	Number	%	Number	%	Number	%	Number	%	Number	%
Science	190	5.7	201	5.9	215	6.0	228	6.2	242	6.3
Engg. & Tech.	8	0.2	10	0.3	10	0.3	10	0.3	11	0.3
Medicine	34	1.0	35	1.0	38	1.1	40	1.1	43	1.1
Agriculture	2	0.1	2	0.1	2	0.1	2	0.1	2	0.1
Vet. Science	5	0.2	5	0.1	5	0.1	6	0.1	6	0.1
Other	706	21.2	744	21.9	794	22.2	844	22.9	896	23.6
Total	945	28.5	997	29.3	1064	29.8	1130	30.7	1200	31.4

Table 6.4
**OUTTURN OF S&T PERSONNEL FROM UNIVERSITIES/DEEMED UNIVERSITIES
AND COLLEGES BY FIELDS OF SCIENCE AND QUALIFICATION**

Field of Science	Graduates		Post Graduates		Doctorates		Total	
	1974	1984	1974	1984	1974	1984	1974	1984
Natural Sciences	123772	108686	17437	20341	1515	2954	142724 (80.5%)	131981 (70.1%)
Engg. & Tech.	14079	22010	1268	1918	163	192	15510 (8.8%)	24120 (12.8%)
Medicine	10578	16042	2081	4718	50	70	12709 (7.2%)	20830 (11.1%)
Agriculture & Vet. Science	4505	8045	1419	2614	287	698	6211 (3.5%)	11357 (6.0%)
Total	152934 (86.3%)	154783 (82.2%)	22205 (12.5%)	29591 (15.7%)	2015 (1.1%)	3914 (2.1%)	177154 (100)	188288 (100)

other fields of science have increased in 1984 over 1974. This may be due to the preference for professional courses at graduate level, rather than for pure science.

Doctorate degree holders are highly qualified personnel of education system. Analysis of data of

Ph.D degree recipients during 1986-87 reveals that 52.7% of them were from S&T faculties and the rest 47.3% from arts and other faculties. Pure science alone shared 39% of total doctorates to whom Ph.D degrees were awarded during 1986-87 as given in Table 6.5.

OUTTURN OF S&T PERSONNEL BY FIELD OF SCIENCE

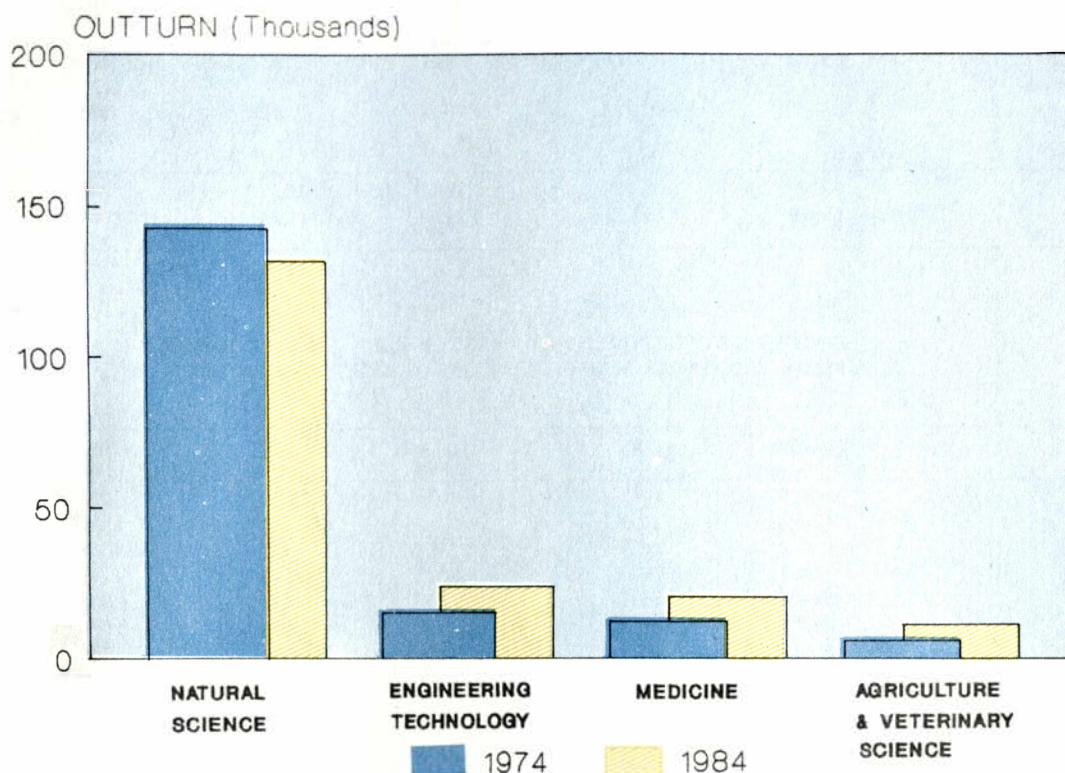


Table 6.5
FACULTYWISE NUMBER OF DOCTORATE DEGREES
AWARDED DURING 1986-87

Faculty	Doctorates	%
Natural Sciences	2937	38.6
Engg. & Tech.	201	2.7
Medicine	63	0.8
Agriculture	649	8.5
Vet. Science	160	2.1
Arts (Including Commerce, Education, Law & others)	3593	47.3
Total	7603	100.0

Teaching staff in higher education play a vital role for training better manpower. UGC is making all efforts to keep the standard of teaching staff upto-date in knowledge, technical know-how, skill by providing requisite facilities and incentives through Faculty Improvement Programme and other schemes. As given in Table 6.6., out of the total 2.42 lakhs of teaching staff serving in higher education sector, 22% were in university departments/colleges and 78% in affiliated colleges. Percentage share of Professors in the total strength of teaching staff was only 2.6% and that of Readers/Senior Lecturers, Lecturers and Tutors

Demonstrators were 15.7%, 77.3% and 4.4% respectively.

It may be said that the break-up of teachers by faculty is not available readily.

As envisaged in NPE (1986), Commission has been strengthening various facilities of educational institutions by way of increased infrastructure facilities such as class rooms, libraries, laboratories, hostels, staff quarters, teacher hostels and other inputs like technical and research support and resources for purchase of equipments, books and journals etc. Some of the salient activities in this direction are discussed below.

Table 6.7 gives the data on assistance given by UGC for the development of science & technology education and research to institutions of higher education during 1979-80 to 1987-88. During 1987-88, Rs. 3353.85 lakhs was spent by UGC for this purpose, which was 10% of the total expenditure of UGC for the corresponding year. 40% of the total grant under this assistance to S&T education and research was utilised for the development of engineering and technology alone, which in actual terms was Rs. 1328.63 lakhs for 1987-88.

Table 6.6
TEACHING STAFF POSITIONED IN HIGHER EDUCATION SECTOR AS ON 1ST APRIL 1988

Organisations	Professors	Readers/ Sr. Lecturers	Lecturers	Tutors/ Demonstrators	Total
Univ. Dep'tts./ Univ. Colleges	6273	13079	31580	2233	53165 (22%)
Affiliated Colleges	—	24923	155389	8496	188808 (78%)
Total	6273 (2.6%)	38002 (15.7%)	186969 (77.3%)	10729 (4.4%)	241973 (100)

Table 6.7
**ASSISTANCE GIVEN BY UGC FOR DEVELOPMENT OF SCIENCE & TECHNOLOGY
EDUCATION AND RESEARCH TO INSTITUTIONS OF HIGHER EDUCATION**

(Rs. in lakhs)

Year	Science	%	Engg. & Tech.	%	Total Grants
1979-80	875.32	68.1	409.53	31.9	1284.85
1980-81	924.61	72.6	349.15	27.4	1273.76
1981-82	1194.85	61.3	755.23	38.7	1950.08
1982-83	595.27	53.4	520.32	46.6	1115.59
1983-84	1964.13	77.4	574.77	22.6	2538.90
1984-85	1457.96	74.1	509.11	25.9	1967.07
1985-86	1982.91	78.2	551.95	21.8	2534.86
1986-87	1959.52	77.5	568.27	22.5	2527.79
1987-88	2035.23	60.4	1328.63	39.6	3353.85

Financial support to institutions of higher education for S&T research has been given in the form of schemes like establishment of Centres of Advanced Study (CAS), Departmental Special Assistance (DSA), Departmental Research Support Projects (DRSP) and Committee for Strengthening of Infrastructure in Science & Technology (COSIST) etc..

Table 6.8 and 6.9 shows the grants allocated to CAS and DSA in science for certain years. During

Table 6.8
**ALLOCATION OF GRANTS FOR CENTRES OF
ADVANCED STUDY (CAS) IN SCIENCE**
(Rs. in lakhs)

Year	Allocation of Grants
1978-79	42.15
1979-80	28.36
1980-81	94.34
1981-82	38.45
1982-83	63.29
1983-84	24.76
1984-85	176.03
1985-86	271.85
1986-87	106.99
1987-88	89.85

Table 6.9
**ALLOCATION OF GRANTS UNDER DEPARTMENTAL
SPECIAL ASSISTANCE (DSA) TO SELECTED
DEPARTMENTS OF SCIENCE**
(Rs. in lakhs)

Year	Allocation of Grants
1983-84	590.34
1984-85	224.22
1985-86	442.02
1986-87	193.90
1987-88	325.56

1987-88 a sum of Rs. 89.85 lakhs in CAS and Rs. 325.56 lakhs in DSA has been spent for financing 25 and 74 projects respectively. In addition, under DRSP 51 projects and in COSIST 62 projects for various S&T departments of universities/colleges were funded during 1987-88.

Apart from these schemes, the Commission is also providing financial support/assistance to the faculty members in the universities/colleges as well as to the retired teachers to enable them to take up well defined time bound research projects in pure and applied sciences and engineering/technology related to national R&D effort or in new fields and interdisciplinary areas of importance.

During 1987-88, 167 such major research projects on S&T to the tune of Rs. 189.4 lakhs were funded. Similarly, during the same year 987 minor research projects in S&T subjects to the tune of Rs. 100.08 lakhs were also supported as given in Table 6.10.

It may not be out of place to mention in this chapter some of the special efforts taken by UGC in recent years towards strengthening of S&T education and research are like establishment of inter university centres such as Nuclear Science Centre, National Centre in Astronomy, Science Information Centre, Centre in Astronomy and Astrophysics to enable the students and scientists to interact with each other and using special facilities available there. It may not be possible for the Commission to establish such centres in every university due to the financial constraints, involved. An amount of Rs. 1378.60 lakhs has been spent for Nuclear Science Centre, situated in JNU Campus during 1985-86 to

Table 6.10
SUBJECTWISE MINOR RESEARCH PROJECTS FUNDED
BY UGC ON S&T DURING 1987-88

Subject	No. of Projects	Rs. in lakhs
Chemistry	220	19.46
Physics	167	19.35
Botany	149	13.65
Zoology	188	16.44
Medicine/Pharmacy	58	4.82
Geology	38	4.67
Geography	38	4.43
Mathematics	124	16.37
Engg. & Tech.	5	0.89
Total	987	100.08

1987-88. In addition to these, some of the novel programmes like superconductivity research, Indian Middle Atmosphere Programme etc. are also sponsored by UGC.

To sum up, the salient features are as under :

- There were 164 universities/deemed universities, 10 institutes of National importance and 6597 colleges during 1987-88 to impart higher education in the country.
- 38.14 lakh students were enrolled for higher education, out of which 29.5% were in S&T faculties during 1987-88.
- Women enrolment in S&T faculty was 7.9% in total enrolment during 1987-88.
- Percentage share of S&T enrolment was static with 29.5% during the period 1983-84 to 1987-88.
- Outturn of S&T personnel increased from 1,77,154 in 1974 to 1,88,288 in 1984. However, there was 10% decrease in outturn percentage in natural sciences for the corresponding period.
- Out of 7603 Ph.D degrees awarded during 1986-87, 2937 doctorates were from pure science.
- During 1987-88 there were 2.42 lakhs of teaching staff in higher education sector, out of which 2.6% represented Professors.
- Rs. 3353.85 lakhs was spent by UGC for the development of S&T education and research during 1987-88 which was 10% of their total expenditure of UGC.

CHAPTER VII

APPLICATIONS OF R&D

Scientific research is an activity with multiple objectives such as higher productivity, reduction of costs, control of diseases etc. The steering group on Science and Technology and Environment for the 7th Five Year Plan in the chapter on S&T and productivity stated that "In all sectors of economy, scientific and technological inputs necessary for raising the productivity of existing investments would need to be ensured. One of the difficulties in laying down objectives for productivity on quantified basis is the lack of an inadequate data base". If measuring the productivity in the manufacturing activity is difficult, it is much more difficult to measure the output of research and development, as the results of research and development are partly intangible in nature which cannot be quantified easily. Besides, there are conceptual difficulties in defining the output of R&D in clear and unambiguous terms. Nevertheless, one can make an attempt to collect data on some parameters like patents and knowhow developed and utilised, royalties and fees received from the processes sold out, research and other publications etc. which might directly or indirectly measure the output of R&D.

Most of the research efforts except those of fundamental nature can lead to generation of new processes, products etc. which can be patented with a view to regulating their exploitation. The patent provides protection to avoid duplication (or copying) of the invention. Therefore, data on patents registered in a particular year and its comparison with data of similar nature for the earlier years do indicate the direction in which the research efforts of the country are progressing. Annual reports of Controller General of Patents, Trade Marks and Designs contain time series data on patents covering its various facets. As is known, patents can be registered not only in one's own country but in other countries too. Though data is available regarding number of applications filed for patents by foreign nationals in India, similar information for Indians applying for patents in other countries is not readily available from these Annual Reports. To that extent, the data presented in the ensuing paragraphs are incomplete.

The relevant tables containing detailed information on applications for patents from persons in India and abroad, applications for patents filed in

India by foreign countries, patents filed and sealed etc. are given at the end and these may be referred appropriately.

If one looks at the data for the last 10 years, one finds that the number of applications for patents made every year is of the order of 3000 with the highest number of 3526 applications for patents being made during 1985-86 and the number of patents applied for was 3457 during 1987-88, the latest year for which data was available. The number of applications for patents has been increasing from 1980-81. This increase can be attributed to the number of applications made by foreigners residing abroad. The number of applications by Indians were more or less stagnant at 1000 applications per annum.

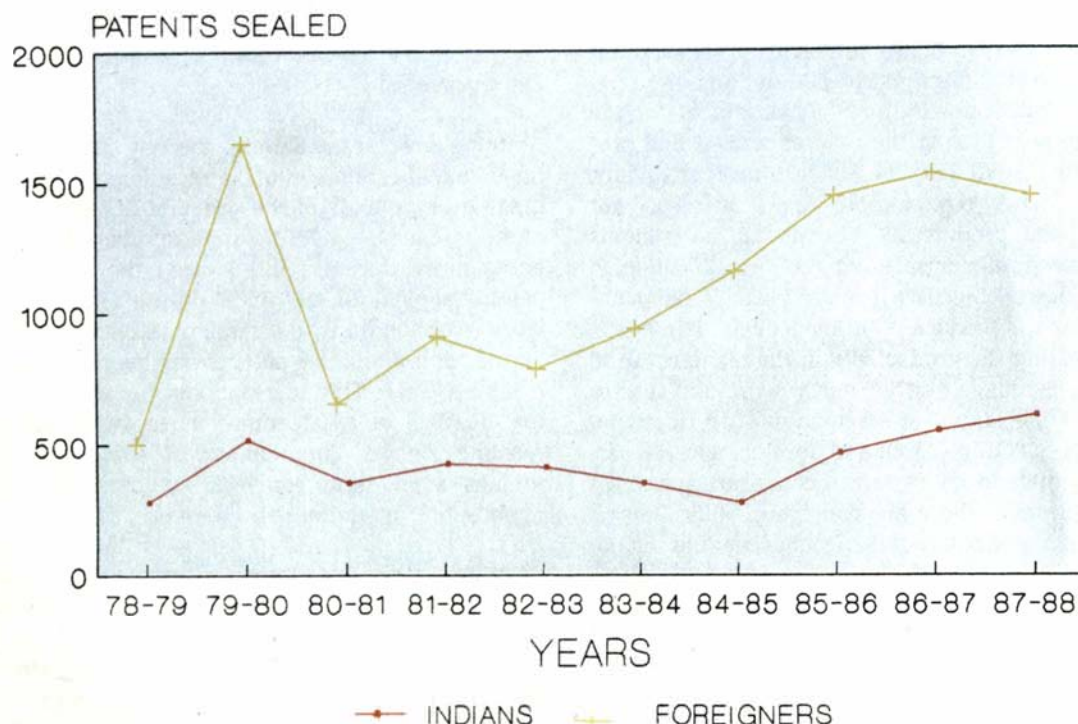
Table 7.1 provides information on the country-wise breakup in respect of some selected countries for number of patent applications received during 1986-87 and 1987-88. The number of applications for patents received during 1987-88 was 2527 as against 2506 during the previous year. About 70% of the total applications for patents received in 1987-88 were in the name of foreigners and the rest were in the name of Indian nationals.

Table 7.1
NUMBER OF APPLICATIONS FOR PATENTS FILED
FROM FOREIGN COUNTRIES

Name of the country	No. of applications filed	
	1986-87	1987-88
USA	857	950
Federal Republic of Germany	307	305
UK	306	257
France	191	171
Japan	135	126
Switzerland	137	109
Italy	67	57
USSR	64	99
Netherlands	73	46
Other Countries	369	407
Total	2506	2527

It may be seen from Table 7.1 that USA roughly accounts for 34% of the total applications received from foreign nationals during 1986-87. This has increased to 37.6% in 1987-88. USA together with

NUMBER OF PATENTS SEALED BY INDIANS AND FOREIGNERS DURING THE PERIOD 1978-79 TO 1987-88



FRG, UK, France and Japan accounted for about 72% of total applications received from foreigners.

During the year 1987-88, 930 applications for patents were filed by Indian nationals. Out of this, about 56.8% originated from the state of Maharashtra and union territory of Delhi. About 9.1% and 8.4% of the total applications were from the states of West Bengal and Tamil Nadu. These four states accounted for about two third of total number of applications filed in the country by Indian nationals.

Table 7.2 gives information on the number of patents sealed in name of Indians and Foreigners during ten years duration. The number of patents sealed during the year 1987-88 was 2104 and out of this 72% were in the name of foreign citizens.

It may be noted from Table 7.2 that there has almost been a constant increase in the total number of patents sealed during the period 1980-81 to 1987-88 except some marginal fluctuations from year to year. The maximum number of patents were sealed during 1979-80 which level has not yet been achieved.

Table 7.2
NUMBER OF PATENTS SEALED IN THE NAME OF
INDIANS/FOREIGNERS DURING THE PERIOD
1978-79 TO 1987-88

Year	Indians	Foreigners	Total
1978-79	281	499	780
1979-80	516	1657	2173
1980-81	349	670	1019
1981-82	421	936	1357
1982-83	405	822	1227
1983-84	340	980	1320
1984-85	263	1206	1469
1985-86	451	1500	1951
1986-87	532	1594	2126
1987-88	588	1516	2104

During the year 1987-88, 12265 patents were in force. Out of this, about 82.5% were in the name of foreign nationals.

The National Research and Development Corporation (NRDC), a Government of India public sector undertaking has its main charter of commercialising R&D results in the country. One of the activities under the new approach adopted by

this corporation is to provide market information alongwith the technical knowhow licensed so as to make the techno-commercial package more complete. The corporation earned total gross royalty and premia to the tune of Rs. 97.93 lakhs during the calender year 1989. The corporation also earned foreign exchange amounting to Rs. 8.23 lakhs during the financial year 1988-89.

With a view to promote the spirit of inventivity amongst scientists, workers and students cash awards amounting to Rs. 2.15 lakhs were given by the corporation to 30 inventors on Republic Day of 1989. During the year 1988-89, the corporation received 56 applications from individual inventors for assistance for filing patent applications in India of which assistance was granted to 10 inventors based on the patentability of inventions involved.

The data on the number of parameters like patents sealed, products developed, processes developed, import substitutes developed, design prototypes developed and consultancy services rendered by R&D institutions in different sectors were collected from the primary source through the national survey. Table 7.3 highlights these data.

It may be kept in the mind while making use of these data that the response was low and not always complete. Besides, it is also possible that the data provided by the responding units may be cumulative rather than one year data. The qualitative evaluation of the output has not been done.

It may be seen from Table 7.3 that out of 399 patents sealed by Indian citizens 63.9% were from the private sector, 11.8% were from public sector and rest 24.3% were from institutions under central and state sector. For all other parameters also private sector has the major share except in case of consultancy services rendered where central sector dominates over other sectors.

The results of scientific research can be disseminated through research papers published in research journals and also through the papers presented in national and international seminars/workshops. Therefore, it may be appropriate to include number of papers published or the seminars attended as a measure of productivity of R&D. The available information in this regard has been compiled for institutional and industrial sector separately and the same has been presented in Table 7.4.

Ideally academic institutions and also individual researchers not assigned to organised laboratories should also have been included but due to limitations of resources, this exercise has been restricted to research laboratories under the central and state governments as also the inhouse R&D units of public and private sector industries. Therefore, the data given in Table 7.4 should be used as indicative rather than exact. The reservations about data in Table 7.3 expressed earlier may also hold good for data in Table 7.4 as well.

Table 7.3
R&D OUTPUT BY SECTOR DURING 1987-88

R&D Output	Central sector	Public sector	Private sector	State sector	Total
Patents sealed	94	47	255	3	399
Products developed	342	702	7531	39	8614
Processes developed	226	411	1964	9	2610
Import substitutes developed	64	1436	2074	—	3574
Design prototypes developed	146	246	1607	28	2027
Consultancy services rendered	22702	184	585	93	23564

Table 7.4
NUMBER OF S&T PERSONNEL TRAINED AND PAPERS/BOOKS PUBLISHED DURING 1987-88 BY SECTOR

Publications/Personnel Trained	Institutional sector	Industrial sector	Total
Papers published	10489	1633	12122
Books Published	1254	66	1300
Regular reports published	7565	3448	11013
Adhoc reports published	1052	910	1962
Number of S&T personnel deputed for various national and international seminars	3885	6213	10098
Number of S&T personnel deputed for various national and international training programmes	2322	5187	7509

To sum up, the salient features are as follows :

- | | |
|---|--|
| <ul style="list-style-type: none">- The total number of patents sealed during 1987-88 were 2104 and out of this 588 were in the name of Indian citizens. This is a mere 28% of the total patents sealed in India.- Out of 930 applications for patents filed by Indians during 1987-88, 56.8% were from Maharashtra and union territory of Delhi. This | <ul style="list-style-type: none">- was followed by West Bengal and Tamil Nadu with 9.1% and 8.4% respectively.- The number of foreign patents in force has declined from 19,780 in 1976-77 to 10,115 in 1987-88.- A total of 12,122 papers and 1300 books were published in 1987-88 by R&D units comprising both institutional and industrial sector. |
|---|--|

CHAPTER VIII

INTERNATIONAL COMPARISON

In the preceding chapters, an analyses has been attempted on the total research and development efforts and its components by various sectors. This chapter has been devoted to assess the relative progress in scientific and technological activities achieved by India in comparison to other developing and developed countries. Such a comparison though prima facie appears to be simple and straight forward, entails a number of difficulties, both conceptual and operational. Though most of the developed countries and few of the developing countries have a well organised data collection system yet the concepts vary from country to country. So, it is difficult to compare these data because of the varying concepts and definitions used. A complete data system or very recent data are also often lacking for most of the developing countries and even for some developed countries. Keeping in view the constraints given above, an attempt has been made in the ensuing paragraphs to throw some light on the S&T parameters related with socio-economic parameter for some selected countries comprising both developing and developed.

According to the Statistical Year Book 1988 of UNESCO the total investment on research and development in the world during 1970 was of the order of US \$ 62.1 billion. This increased to US \$ 113.8 billion in 1975 and further increased to US \$ 207.8 billion in 1980. The investment on research and development by the developed countries during 1970 was US \$ 60.5 billion and the rest US \$ 1.6 billion was by the developing countries. In terms of percentage it works out to be 97.4% and 2.6% respectively. In 1975 the share of developed and developing countries was 95.9% and 4.1% and during 1980 this was 93.7% and 6.3% respectively. This clearly shows that the share of developing

countries in the total R&D expenditure is showing an increasing trend. Information regarding expenditure on research and development by continents is given in Table 8.1.

One of the most commonly used indicator for international comparison of S&T efforts is the proportion of gross national product devoted to research and development activities. The expenditure on R&D as percentage of GNP for the whole world in 1980 was 1.78%. For the developed countries this percentage has gone down from 2.36% in 1970 to 2.25% in 1975 and further to 2.23% in 1980 whereas in case of developing countries the percentages for these three years were 0.32%, 0.38% and 0.45% respectively. Table 8.2 gives data for R&D expenditure as percentage of GNP in respect of certain selected countries comprising of both developing and developed grouped in classes ranging from 0-0.5%, 0.6%-1.0%, 1.1%-2.0%, 2.1%-3.0% and 3.1%-5.0%.

It may be seen from Table 8.2 that most of the developed countries spend between 2% to 3% of their GNP on R&D. Czechoslovakia, German Democratic Republic and USSR spent more than 4% of their GNP on R&D.

It might be useful to examine whether the countries having high per capita gross national product also invest more on R&D. For this purpose per capita GNP has been broken down into five groups as shown in Table 8.3.

it may be noted from Table 8.3 that the developed countries in the highest per capita GNP category of above US \$ 10000 have their per capita R&D expenditure more than US \$ 120. Even those

Table 8.1
ESTIMATED EXPENDITURE AND PERCENTAGE SHARE OF R&D FOR 1970, 1975 AND 1980 BY CONTINENTS

Name of the continent	Expenditure on R&D in billion US dollars and % share in brackets		
	1970	1975	1980
Africa	0.2(0.3)	0.5(0.4)	1.2(0.6)
America	28.1(45.2)	40.1(35.2)	70.4(33.9)
Asia	4.6(7.4)	12.5(11.0)	31.2(15.0)
Europe	15.7(25.3)	36.4(32.0)	70.7(34.0)
Oceania	0.5(0.8)	1.2(1.0)	1.9(0.9)
USSR	13.0(20.9)	23.2(20.4)	32.4(15.6)

Table 8.2
EXPENDITURE ON R&D AS PERCENTAGE OF GNP

0-0.5%		0.6%-1.0%		1.1%-2.0%		2.1%-3.0%		3.1%-5.0%	
Egypt	0.2(1982)	Brazil	0.7(1982)	Australia	1.3(1985)	FRG	2.5(1983)	Czechoslovakia	4.1(1986)
Indonesia	0.3(1986)	Cuba	0.6(1984)	Austria	1.2(1981)	France	2.3(1985)	GDR	4.5(1986)
Nigeria	0.3(1977)	Yugoslavia	0.8(1986)	Canada	1.5(1985)	Hungary	2.6(1986)	USSR	5.1(1986)
Pakistan	0.3(1984)	India	1.00(1988)	Italy	1.3(1985)	Japan	2.8(1985)		
Philippines	0.2(1982)			Republic of Korea	1.8(1986)	Sweden	3.0(1985)		
Venezuela	0.4(1985)					UK	2.2(1983)		
						USA	2.8(1986)		

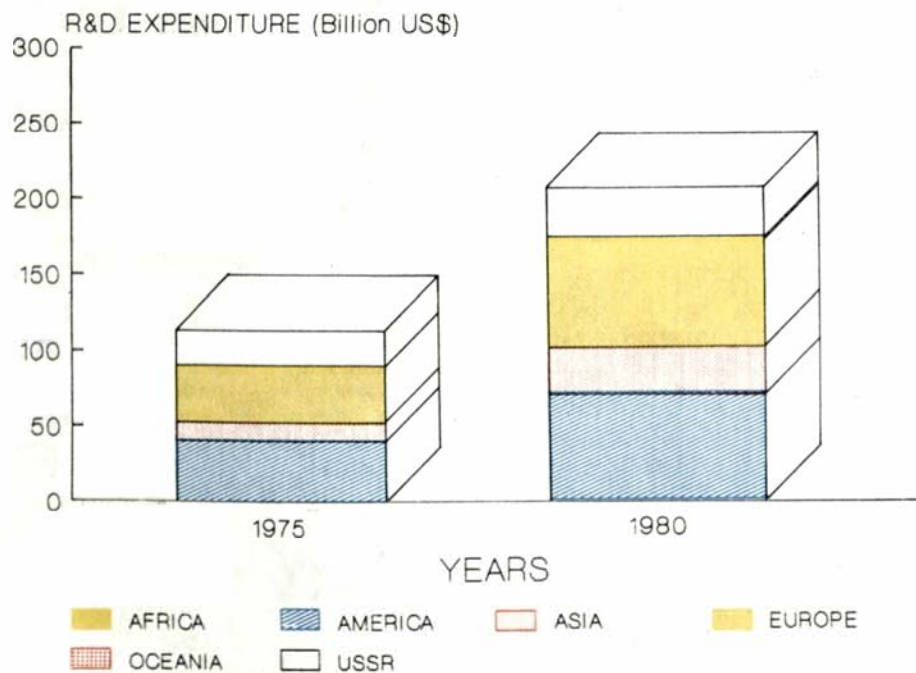
Note : Figures in brackets indicate years

Table 8.3
PER CAPITA R&D EXPENDITURE IN US \$ FOR SOME SELECTED COUNTRIES
GROUPED BY PER CAPITA GNP IN US DOLLARS

Per Capita GNP below \$ 500		Per capita GNP between \$ 500-2000		Per capita GNP between \$ 2000-5000		Per capita GNP between \$ 5000-10000		Per capita GNP above \$ 10,000	
India	3.06(1988)	Cuba	18.22(1984)	USSR	117.88(1984)	Austria	103.14(1981)	Australia	121.02(1985)
Indonesia	1.11(1986)	Brazil	13.41(1982)	Yugoslavia	23.43(1986)	Czechoslovakia	151.21(1986)	Denmark	141.73(1985)
Pakistan	1.11(1984)	Egypt	1.28(1982)	Hungary	56.11(1986)	GDR	314.95(1986)	Canada	188.13(1985)
		Nigeria	2.17(1977)	Rep. of Korea	41.14(1986)	Italy	83.47 (1985)	FRG	272.50(1983)
		Philippines	1.21(1982)	Spain	22.59(1985)	France	215.81(1985)	Japan	308.67(1985)
						UK	177.88(1983)	Sweden	347.74(1985)
						USA	494.3(1986)		

Note : Figures in brackets Indicate years.

ESTIMATED R&D EXPENDITURE FOR 1975 AND 1980 BY CONTINENTS



developed countries, whose per capita GNP were between US \$ 5000 and 10000, were having above US \$ 100 per capita R&D expenditure. Most of the developing countries have their per capita R&D expenditure less than US \$ 10. For India this figure was only US \$ 3.06. It appears from this table that countries with higher per capita GNP have high value of per capita R&D expenditure barring some exceptions.

Potential scientists, engineers and technicians constitute another important input for research activities. In order to iron out inter country differences due to varying population sizes, their

number is usually expressed per thousand population. It may be noted from the Table given at the end that Japan tops the list with 313.6 scientists, engineers and technicians per thousand population for the year 1982. For USA this figure was only 14.8 for the year 1982. For India, the number of scientists, engineers and technicians per thousand population was only 3.43 for the year 1985. Not all scientists, engineers and technicians are engaged in research and development activities. From the Table, it may be seen that their number per thousand population varies from 12.9 in case of Israel to 0.03 for Nepal. For India this figure for 1988-89 was 0.22.

To sum up, the salient features of international R&D scene are given as under :

- Most of the developed countries spent 2% to 3% of their GNP on R&D. For India this figure for 1988-89 was 1.00%.
- India's per capita R&D expenditure was only a mere US \$ 3.06 whereas this was between US

\$ 100 and US \$ 500 for most of the developed countries.

- India has 3.43 scientist, engineers and technicians (SET) per thousand of population as compared to 313.6 in Japan. Only 0.22 SET per thousand population were engaged in R&D activities in India whereas Japan has 5.6 SET engaged in R&D per thousand population.

CHAPTER IX

SCIENCE AND TECHNOLOGY PLAN

The allocation for Science and Technology has been steadily increasing since independence, as may be seen from Table 9.1 giving details about Planwise total allocation.

Table 9.1
S&T ALLOCATION IN THE FIVE YEAR PLANS

Plan	S&T Allocation (Rs. Crores)		
	Plan	Non-Plan	Total
1st Plan	14	6	20
2nd Plan	33	34	67
3rd Plan	71	73	144
4th Plan	142	231	373
5th Plan	693	688	1381
6th Plan	2064	1652	3716
7th Plan	4257*	3311*	7568*

* Estimated

From Rs. 20 crores in the First Plan the allocation has increased to Rs. 3716 crores in the 6th Plan and further to Rs. 7568 crores in the 7th Plan just ended.

It may be seen from Table 9.1 that growth in allocation for Science and Technology was not very significant till the 4th Plan. But, the 5th Five Year Plan has witnessed a four fold increase in expenditure over the 4th Plan Period. Thereafter, the increase in the allocation was sizeable.

Table 9.2 provides data on the share of S&T in the total public sector outlay for the various five year plans. During the 7th Plan, the share of S&T in the total public sector outlay was 2.4%.

Having said about the total S&T allocation over the various plan periods, it is in order to analyse

PERCENTAGE SHARE OF SEVENTH PLAN S&T ALLOCATION (PLAN + NON-PLAN) BY SOCIO-ECONOMIC SECTORS

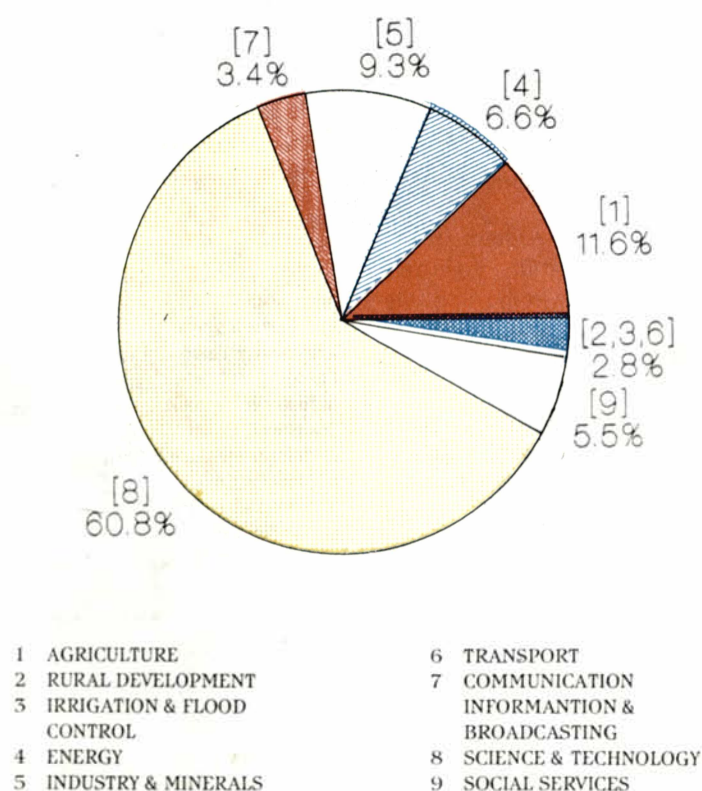


Table 9.2
S&T PLAN OUTLAY AS PERCENTAGE OF TOTAL PUBLIC
SECTOR PLAN OUTLAY IN THE FIVE YEAR PLANS

Plan	S&T Plan outlay as percentage of total public sector plan outlay
1st Plan	0.5
2nd Plan	0.7
3rd Plan	0.8
4th Plan	0.9
5th Plan	1.8
6th Plan	1.8
7th Plan	2.4

the distribution of S&T allocation between various ministries/departments of the central government. The scientific agencies in the central government account for more than 75% of the total allocation of the central government in the various plan periods. Table 9.3 may be referred for the distribution of allocation for S&T between scientific agencies and the rest of the central government ministries for the last three Five Year Plans.

Table 9.3
SHARE OF S&T ALLOCATION BY SCIENTIFIC AGENCIES
AND BY OTHER MINISTRIES/DEPARTMENTS OF THE
CENTRAL GOVERNMENT

Plan	Percentage of S&T allocation for scientific agencies (Plan + Non-Plan)	Percentage of S&T allocation for other central ministries/ departments (Plan + Non-Plan)
5th Plan	79.6	20.4
6th Plan	81.2	18.8
7th Plan	76.0	24.0

It is worth examining the inter se share of the allocation between various scientific agencies. Table 9.4 provides such analyses regarding the share of S&T allocation by different scientific agencies during the 6th and 7th Five Year Plans.

It may be seen from Table 9.4 that the Department of Atomic Energy, Department of Space, Department of Science and Technology, the Council of Scientific and Industrial Research and Indian Council of Agricultural Research account almost the entire share of the total allocation of the scientific agencies.

Table 9.4
SHARE OF S&T ALLOCATION BY SCIENTIFIC AGENCIES
DURING 6TH AND 7TH FIVE YEAR PLANS

Agency	Percentage of allocation (Plan + Non-plan)	
	6th Plan	7th Plan
Department of Atomic Energy (DAE)	15.9	13.7
Council of Scientific and Industrial Research (CSIR)	13.9	11.6
Department of Scientific and Industrial Research (DSIR)	—	0.3
Department of Space (DOS)	13.1	14.2
Department of Science and Technology (DST)	14.7	11.0
Department of Environment (DOEn)	1.7	5.2
Department of Ocean Development (DOD)	2.6	2.0
Department of Biotechnology (DBT)	—	1.7
Indian Council of Agricultural Research (ICAR)	14.6	10.9
Indian Council of Medical Research (ICMR)	2.1	2.9
Department of Non-Conventional Energy Sources (DNES)	1.8	1.7
Department of Electronics (DOE)	0.6	0.5

The various Ministries/Agencies of the Central Government can be divided into a number of socio economic sectors. It is interesting to see the share of the allocation for S&T by such sectors as well. Table 9.5 gives the share of various socio-economic sectors during the 6th and 7th Plan periods.

Table 9.5
S&T ALLOCATION BY SOCIO-ECONOMIC SECTORS

Sector	Percentage of S&T Allocation	
	6th Plan	7th Plan
Agriculture	15.1	11.6
Rural Development	0.1	0.1
Irrigation & Flood Control	0.8	0.7
Energy	4.6	6.6
Industry & Minerals	9.5	9.3
Transport	1.4	2.0
Communications, Information & Broadcasting	2.1	3.4
Science and Technology	62.0	60.8
Social Services	4.4	5.5
Total	100.0	100.0

To sum up, the salient features of S&T Plan are as under :

- There has been a steady increase in the allocation of funds to S&T from the First to the Seventh Plan.
- During the 7th Plan, about 75% of the allocation was for scientific agencies. At the same

time, the trend indicates that the share of other ministries was increasing.

- Among the socio-economic sectors, two sectors energy and communications (including Information and Broadcasting) have increased their share in the 7th Plan as compared to the earlier plan.

STATISTICAL TABLES

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Table 1
NATIONAL EXPENDITURE ON RESEARCH AND DEVELOPMENT BY SECTOR

(Rs. Crores)

Sector	Research and Development Expenditure														
	1948-49	1950-51	1955-56	1958-59	1965-66	1970-71	1975-76	1980-81	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90
Central Sector	1.10	4.68	12.14	21.78	62.45	112.47	287.63	580.49	1053.37	1422.25	1654.06	2039.68	2442.75	2875.11	3306.38
State Sector	N.A.	N.A.	N.A.	1.00	3.51	12.58	26.73	59.34	119.90	126.11	162.78	164.56	183.92	232.91	260.86
Private Sector	N.A.	N.A.	N.A.	0.15	2.43	14.59	42.35	120.69	207.83	233.19	251.94	291.63	310.27	363.79	436.55
Total	1.10	4.68	12.14	22.93	68.39	139.64	356.71	760.52	1381.10	1781.55	2068.78	2495.87	2936.94	3471.81	4003.79

Source : 1. Data collected and compiled by DST.

2. Data for 1948-49 and 1950-51 Science Policy and Organisation of Scientific Research in India page 99.

3. Data up to 1970-71 Report on Science and Technology, 1970-71 brought out by COST.

Note : 1. Data for 1948-49 represents only expenditure of CSIR, ICAR, ICMR and DAE.

2. A number of organisations are engaged in scientific and technological activities such as weather forecasting, geophysical surveys, teaching, consultancy etc. In addition they also undertake research for which in a number of cases no separate account is maintained. Wherever such details have not been provided, their expenditure on research has been estimated.

3. The number of units in the private sector varies from year to year.

4. Data for 1989-90 has been estimated by applying the following rates of growth :

Central Sector 15%, State Sector 12%, Private Sector 20%.

5. Data refers to 895 Private Sector Industries which include projected data for 67.

6. N.A. = Not available.

Table 2
NATIONAL EXPENDITURE ON RESEARCH & DEVELOPMENT IN RELATION TO GNP

Particulars	1958-59	1965-66	1970-71	1975-76	1980-81	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89
GNP at current prices (Rs. crores)	12635	21866	36452	66375	122571	185047@	206445@	232730@	258637@	291789*	346277*
Expenditure on R&D (Rs. crores)	22.93	68.39	139.64	356.69	760.52	1381.10	1781.55	2068.78	2495.87	2936.94	3471.81
Expenditure on R&D as percentage of GNP	0.18	0.31	0.38	0.53	0.62	0.75	0.86	0.89	0.96	1.00	1.00

Source : (i) Data on R&D expenditure collected and compiled by DST.

(ii) Data on GNP – Economic Survey, 1989-90.

Note : 1. Figures of GNP from 1980-81 are based on the new series issued by Central Statistical Organisation.

2. @ Provisional.

3. * Quick Estimate.

Table 3
EXPENDITURE ON R&D AT CURRENT AND CONSTANT PRICES

(Rs. Crores)

Year	Expenditure on R&D	
	Current Prices	Constant Prices (1980-81)
1980-81	760.52	760.52
1981-82	940.73	853.34
1982-83	1206.03	1012.69
1983-84	1381.10	1069.57
1984-85	1781.55	1284.00
1985-86	2068.78	1388.02
1986-87	2495.87	1565.13
1987-88	2936.94	1694.77
1988-89	3471.81	1866.29

Source : Data collected and compiled by DST.

- Note : 1. For working out R&D Expenditure at Constant Prices, GNP price deflator-as per Economic Survey 1989-90 have been used.
2. R&D = Research & Development.

Table 4
R&D EXPENDITURE BY MAJOR SCIENTIFIC AGENCIES UNDER THE CENTRAL GOVERNMENT

(Rs. Lakhs)

Agency	R&D Expenditure								
	1958-59	1970-71	1975-76	1980-81	1982-83	1984-85	1986-87	1987-88	1988-89
Department of Atomic Energy	775.88	2871.56	5394.00	7347.81	11620.10	18151.70	22187.65	26316.00	30234.00
Council of Scientific & Industrial Research	509.94	2155.73	3711.00	6900.00	11408.40	12636.00	17233.45	18512.92	21118.10
Defence Research & Development Organisation	150.00	1755.35	5217.00	7970.00	12734.80	33732.40	43100.00	54900.00	57800.00
Indian Council of Agricultural Research	372.29	1837.00	3294.00	9744.67	10354.00	13083.60	16319.99	17294.00	20116.95
Indian Council of Medical Research	50.50	217.63	332.00	900.11	1543.13	2605.68	3994.47	3918.00	4651.00
Department of Science & Technology	22.13	84.18	525.01	4063.69	8765.28	9616.24	11379.81	12223.95	15589.55
Department of Space	—	—	3666.80	5601.56	9735.68	18288.00	30999.09	36628.00	43210.00
Department of Electronics	—	—	238.01	540.55	484.97	410.89	444.74	777.00	740.00
Department of Environment	—	—	—	373.99	860.92	4137.67	9011.11	12335.32	14642.93
Department of Ocean Development	—	—	—	—	4930.00	1222.70	1205.43	1402.30	2175.60
Department of Non-Conventional Energy Sources	—	—	—	400.44	1280.00	1069.30	2405.74	2473.08	2547.08
Department of Biotechnology	—	—	—	—	—	—	1059.61	2437.56	3452.10
Total	1880.74	8921.45	22377.82	43842.82	73717.28	114954.18	159341.10	189218.10	216277.30

Source : Data collected and compiled by DST.

Table 5
R&D EXPENDITURE BY CENTRAL MINISTRIES/DEPARTMENTS

(Rs. Lakhs)

Ministry/Department	R&D Expenditure		
	1986-87	1987-88	1988-89
Agriculture & Cooperation	1403.83	1557.29	1755.91
Rural Development	286.10	233.00	400.00
Fertilizers	1488.77	1935.61	2230.70
Commerce	485.18	517.95	518.99
Textiles	845.66	939.80	1181.63
Supply	219.13	263.00	327.00
Posts	2.12	5.00	6.00
Telecommunications	4322.68	5003.28	5875.03
Defence	6.48	10.50	20.50
Defence Production & Supplies	6103.62	8391.58	12970.30
Coal	873.06	2015.84	2467.25
Power	684.79	949.68	1475.59
Food	236.11	315.16	1356.17
Civil Supplies	349.82	478.62	516.60
Health	1210.78	1252.38	1517.23
Family Welfare	345.63	882.42	386.02
Home	260.95	499.96	607.18
Education (including Univ.)	3914.24	5025.21	4918.65
Culture	652.30	753.77	821.47
Industrial Development	1315.36	1990.84	4417.68
Petrochemicals	926.36	1177.89	1263.13
Public Enterprises	5954.23	6046.95	6221.20
Information & Broadcasting	94.45	133.66	174.34
Labour	293.82	265.70	355.79
Petroleum & Natural Gas	3503.68	3386.76	3910.63
Steel	2809.26	3130.74	3422.82
Mines	661.77	929.03	1412.03
Railways	1562.40	2358.77	3514.76
Civil Aviation	107.34	134.71	227.07
Surface Transport	533.73	705.75	1124.96
Urban Development	107.49	142.91	189.97
Water Resources	1386.82	1436.43	2352.10
Public Sector under Major Scientific Agencies	678.59	989.99	1545.84
Joint Sector Undertakings	1000.14	1196.95	1749.54
Total	44626.69	55057.13	71234.08

Source : Data collected and compiled by DST.

Note : R&D Expenditure by Public Sector Undertakings under Major Scientific Agencies and State Undertakings are also included in the Table.

Table 6
EXPENDITURE ON RESEARCH AND DEVELOPMENT BY STATE GOVERNMENTS

(Rs. Lakhs)

State	R&D Expenditure		
	1986-87	1987-88	1988-89
Andaman & Nicobar Island	0.00	0.00	0.00
Andhra Pradesh	1461.38	1484.30	1731.55
Arunachal Pradesh	0.00	0.00	0.00
Assam	469.63	490.49	422.85
Bihar	879.62	806.18	985.49
Chandigarh	0.00	0.00	0.00
Delhi	0.00	0.00	0.00
Dadra & Nagar Haveli	0.00	0.00	0.00
Goa, Daman & Diu	0.00	0.00	0.00
Gujarat	1336.41	1465.88	1616.45
Haryana	552.92	655.37	571.30
Himachal Pradesh	377.51	551.97	656.50
Jammu & Kashmir	178.21	196.03	215.63
Karnataka	881.72	1197.32	1882.03
Kerala	1241.34	1075.91	1533.82
Lakshadweep	0.00	0.00	0.00
Madhya Pradesh	683.20	820.85	1226.13
Maharashtra	3268.40	3771.74	4272.99
Manipur	0.00	0.00	0.00
Meghalaya	0.00	0.00	0.00
Mizoram	0.00	0.00	0.00
Nagaland	0.00	0.00	0.00
Orissa	224.75	256.54	282.98
Pondicherry	0.00	0.00	0.00
Punjab	847.93	1012.95	2791.56
Rajasthan	998.47	1233.66	1388.42
Sikkim	0.00	0.00	0.00
Tamil Nadu	1213.43	1320.66	1501.16
Tripura	0.00	0.00	0.00
Uttar Pradesh	1653.40	1857.86	1978.50
West Bengal	188.00	194.17	233.49
Total	16456.31	18391.85	23290.87

Source : Data collected and compiled by DST.

Table 7
R&D EXPENDITURE BY COOPERATIVE RESEARCH ASSOCIATIONS

(Rs. Lakhs)

Association	R&D Expenditure		
	1986-87	1987-88	1988-89
Ahmedabad Textile Industry's Research Association	137.96	157.81	200.42
The Silk and Art Silk Mills Research Association	79.70	193.40	322.40
The South India Textile Industry's Research Association	94.08	107.05	135.34
Bombay Textile Research Association	176.12	202.54*	232.92*
Indian Plywood Industry's Research Association	55.20	94.47	80.86
Tea Research Association	283.74	313.45	348.25
Indian Jute Industry's Research Association	165.53	176.78	229.07
Wool Research Association	14.46	17.70	9.90
National Council for Cement and Building Materials	539.68	620.63*	713.72*
Indian Rubber Manufacturers Research Association	8.39	17.17	14.00
Automotive Research Association of India	818.74	941.55*	1082.79*
Electrical Research and Development Association	38.79	54.46	78.60
Man Made Textile Research Association	35.67	50.47	52.38
Northern India Textile Research Association	26.13	23.44	52.55
Total	2474.19	2970.92	3553.20

Source : Data collected and compiled by DST.

Note : * Estimated.

Table 8
S&T EXPENDITURE BY TYPE OF WORK BY CENTRAL AND STATE GOVERNMENTS
(Rs. Lakhs)

Year	Central Government					State Governments					Total				
	Basic Research	Applied Research	Experimental Development	Other Activities	Total	Basic Research	Applied Research	Experimental Development	Other Activities	Total	Basic Research	Applied Research	Experimental Development	Other Activities	Total
1986-87	24848.16	65311.32	63969.76	41560.28	195689.52	1813.40	10736.71	3906.19	4396.10	20852.40	26661.56	76048.03	67875.95	45956.38	216541.92
1987-88	29381.82	77834.38	77580.23	50153.74	234950.17	1993.12	12116.95	4281.78	4762.66	23154.51	31374.94	89951.33	81862.01	54916.40	258104.68
1988-89	33783.27	90326.06	92214.83	59307.37	275631.53	2496.18	15535.92	5258.77	5664.55	28955.42	36279.45	105861.98	97473.60	64971.92	304586.95

Source : Data collected and compiled by DST.

Note : 1. R&D = Basic Research + Applied Research + Experimental Development

2. S&T = R&D + Other activities.

3. Central Government excluding Public Sector Industry.

Table 9
INDUSTRIAL R&D EXPENDITURE ON ADVERTISING, NEW PLANT AND MACHINERY
VERSUS SALES TURNOVER

Year	R&D Expenditure (Rs. Crores)			Advertising Expenditure (Rs. Crores)			Expenditure on New Plant & Machinery (Rs. Crores)			Sales Turnover (Rs. Crores)			R&D Expenditure as % of Sales Turnover			Advertising Expenditure as % of Sales Turnover			New Plant & Machi- nery Expenditure as % of Sales Turnover		
	Public Sector	Private Sector	Total	Public Sector	Private Sector	Total	Public Sector	Private Sector	Total	Public Sector	Private Sector	Total	Public Sector	Private Sector	Total	Public Sector	Private Sector	Total	Public Sector	Private Sector	Total
1986-87	255.70	269.80	525.50	22.25	227.73	250.00	1820.63	2216.67	4037.30	37199.84	41863.75	79063.59	0.63	0.64	1.27	0.06	0.54	1.20	4.89	5.44	10.33
1987-88	288.47	287.04	575.51	26.32	268.87	295.19	2284.75	2925.18	5209.93	41968.02	49838.68	91806.70	0.69	0.58	1.27	0.06	0.54	1.23	5.44	5.87	11.31
1988-89	361.32	336.55	697.87	28.22	286.40	314.62	1325.86	1595.04	2920.90	46662.48	54208.36	100870.84	0.77	0.62	1.39	0.06	0.53	1.22	2.84	2.94	5.78

Source : Data collected and compiled by DST.

Table 10
R&D EXPENDITURE BY PUBLIC/JOINT SECTOR UNDERTAKINGS, 1988-89

Ministry/ Department/State	Name of Undertaking	R&D Expenditure (Rs. Lakhs)	R&D Expenditure as % of STO
Atomic Energy	Electronics Corporation of India Ltd.	581.68	2.93
	Indian Rare Earths Ltd.	123.35	2.51
	Uranium Corporation of India Ltd.	18.94	0.66
Electronics	CMC Ltd.	439.06	4.28
	Electronics Trade & Technology Dev. Corp.	2.81	0.03
	Central Electronics Ltd.	380.00	15.14
Scientific & Industrial	Madras Fertilizers Ltd.	31.16	0.10
Research	Rashtriya Chemicals & Fertilizers Ltd.	109.97	0.10
	The Fertilizer & Chemicals Travancore Ltd.	66.00	0.16
	Projects & Development India Ltd.	673.57	24.28
Telecommunications	Indian Telephone Industries Ltd.	2472.00	3.36
	Indian Telephone Industries Ltd. Naini	512.00	5.70
	Videsh Sanchar Nigam Ltd.	108.75	5.80
Defence Production & Supplies	Hindustan Teleprinters Ltd.	42.28	2.02
	Bharat Electronics Ltd.	5176.70	11.77
	Bharat Dynamics Ltd.	15.00	0.25
	Hindustan Aeronautics Ltd. Bangalore	5199.82	13.40
	Hindustan Aeronautics Ltd. Kanpur	2.21	0.06
	Hindustan Aeronautics Ltd. Nasik	159.65	0.79
	Hindustan Aeronautics Ltd. Lucknow	512.94	8.07
	Hindustan Aeronautics Ltd.	844.67	18.52
Coal	Bharat Earth Movers Ltd.	1059.31	1.70
	Neyveli Lignite Corporation Ltd.	43.38	0.10
	Central Mine Planning & Design Instt.	1195.16	27.28
Power	Bharat Coking Coal Ltd.	360.99	0.33
	National Thermal Power Corporation	142.00	0.20
	Modern Food Industries	4.13	0.09
Food	Hindustan Latex Ltd.	7.81	0.39
Family Welfare	Hindustan Organic Chemicals Ltd.	65.00	0.39
Petrochemicals	Indian Petrochemicals Corporation Ltd.	692.00	0.71
	Petrofils Cooperative Ltd.	7.20	0.05
	Indian Drugs & Pharmaceuticals Ltd.	219.53	1.30
	Hindustan Antibiotics Ltd.	131.53	1.78
	Hindustan Insecticides Ltd.	79.37	1.45
	Smith Stainstreet Pharmaceuticals Ltd.	42.00	3.50
Public Enterprises	Bengal Immunity Ltd.	26.50	3.59
	Burn Standard Co. Ltd.	21.97	0.16
	Bharat Ophthalmic Glass Ltd.	13.65	6.04
	Cement Corporation of India Ltd.	137.00	0.45
	Mining & Allied Machinery Corpn. Ltd.	2.10	0.02
	National Instruments Ltd.	23.67	2.47
	Tungabhadra Steel Products Ltd.	0.52	0.03
	Heavy Machine Tools Plant	102.00	3.53
	Instrumentation Ltd.	232.19	2.21
	National Newsprint & Paper Mills Ltd.	32.50	0.54
	Bharat Heavy Plates & Vessels Ltd.	22.77	0.15
	Hindustan Photo Films Mfg. Co. Ltd.	105.00	0.70
	Heavy Engineering Corporation Ltd.	102.00	3.53
	HMT Ltd.	471.72	2.39
	Bharat Heavy Electricals Ltd.	4300.00	1.65
	Bharat Pumps & Compressors Ltd.	35.00	0.69
	Maruti Udyog Ltd.	60.50	0.09
	Andrew Yule & Company Ltd.	0.76	0.22
	Andrew Yule & Company Ltd.	60.61	1.62
	Andrew Yule & Company Ltd.	18.25	1.20
	Andrew Yule & Company Ltd.	17.36	1.34
	Scooters India Ltd.	3.28	0.30
	Hindustan Cables Ltd.	135.33	0.27
	Central Metal Forming Institute	33.01	113.83
	HMT Ltd.	4.35	0.27
	HMT Ltd.	117.19	0.77
	HMT Ltd. Bangalore	164.67	0.88

Ministry/ Department/ State	Name of Undertaking	R&D Expenditure (Rs. Lakhs)	R&D Expenditure as % of STO
Petroleum & Natural Gas	Hindustan Salts Jaipur	3.80	0.83
	Lubrizol India Ltd.	450.35	2.76
	Madras Refineries Ltd.	222.39	0.18
	Oil India Ltd.	125.84	0.24
	Indian Oil Corporation Ltd.	1471.00	0.00
Steel	Engineers India Ltd.	882.00	15.54
	Bokaro Steel Plant	105.46	0.05
	Rourkela Steel Plant	107.54	0.08
	IFICO	6.46	0.47
	National Mineral Development Corpn. Ltd.	110.76	1.81
	MECON	32.79	0.40
	Sponge Iron India Ltd.	72.00	5.54
	Durgapur Steel Plant	32.00	0.04
	Steel Authority of India Ltd.	2720.81	0.51
	Visvesvaraya Iron & Steel Ltd.	3.20	0.03
Mines	Bharat Gold Mines Ltd.	88.40	2.44
	Mineral Exploration Corporation Ltd.	2.93	0.05
	Central Research & Development Lab.	99.45	0.42
	Hindustan Copper Ltd.	7.03	0.08
	Bharat Aluminium Co. Ltd.	62.00	0.17
	Hindustan Shipyards Ltd.	13.13	0.15
	Andhra Pradesh Electronics Dev. Corp.	16.00	4.42
	Assam Electronics Dev. Corp.	1.39	0.95
	National Small Industries Corp.	10.00	2.50
	Gujarat State Fertilizers Co. Ltd.	225.00	0.35
Surface Transport Andhra Pradesh Assam Delhi Gujarat	Gujarat Communications & Electronics	325.00	5.42
	Gujarat Narmada Valley Fertilizers	36.47	0.11
	Gujarat State Fertilizers Co. Ltd.	37.47	1.71
	Haryana State Electronics Dev. Corp.	85.00	60.71
	NGEF Ltd.	86.51	0.57
	Karnataka Soaps & Detergents Ltd.	8.30	0.11
	Hutti Gold Mines Co. Ltd.	32.00	1.19
	Kerala State Drugs & Pharmaceuticals	1.95	0.48
	Titanium Products Ltd.	11.10	0.26
	Kerala Minerals & Metals Ltd.	28.00	0.47
Madhya Pradesh Maharashtra	National Information Technologies Ltd.	15.23	0.33
	Haffkins Bio Pharmaceutical Corp. Ltd.	1.45	0.16
	Maharashtra Electronics Corp. Ltd.	16.50	0.41
	Maharashtra Electronics Corp. Ltd.	16.00	2.67
	Maharashtra Electronics Corp. Ltd.	54.85	0.00
	Engel India Machines & Tools Ltd.	25.00	26.32
	Mizoram		
	Orissa		
	Hira Cement Works	20.88	0.44
	Kalinga Iron Works	0.16	0.00
Punjab	Ferro Chrome Plant	0.50	0.04
	The Orissa State Electronics Dev. Corp.	0.04	0.57
	Punjab Tractors Ltd.	51.00	0.43
	Punjab Wireless Systems Ltd.	43.20	0.02
	Punjab State Hosiery & Knitware Dev. Corp.	155.00	70.45
	Bicycle & Sewing Machine R&D Centre	277.43	0.15
	Punjab Recorders	31.15	31.15
	Punjab Communications Ltd.	0.70	0.05
	Punjab Power Packs	9.70	1.62
	Rajasthan		
Rajasthan Tamil Nadu Uttar Pradesh West Bengal	Rajasthan Communications Ltd.	1.20	0.56
	Rajasthan Electronics & Instruments Ltd.	45.46	0.06
	Tamil Nadu Electricity Board	33.90	31.73
	Uptron India Ltd.	25.00	1.10
	Webel Crystals Ltd.	3.49	31.73
	West Bengal Electronics Industry	11.81	0.42
	Webel Business Machines Ltd.	2.50	2.50

Source : Data collected and compiled by DST.

Note : S.T.O. = Sales Turnover.

Table 11
R&D EXPENDITURE BY INDUSTRY GROUPS FOR PUBLIC SECTOR INDUSTRIES

(Rs. Lakhs)

Sl. No.	Industry Group	Number of Industries	Total R&D Expenditure			R&D Expenditure As % of S.T.O.		
			1986-87	1987-88	1988-89	1986-87	1987-88	1988-89
1.	Metallurgical Industries	24	3336.43	4522.59	5229.45	0.37	0.42	0.43
2.	Fuels	5	1620.16	1386.18	1873.71	0.11	0.08	0.11
3.	Boilers & Steam Generating Plants	1	38.03	142.20	22.77	0.40	0.96	0.15
4.	Prime Movers	0	0.00	0.00	0.00	0.00	0.00	0.00
5.	Electronic & Electrical Equipment	21	5116.85	5514.39	6225.01	1.63	1.54	1.55
6.	Telecommunication	12	3306.72	3744.45	3717.15	1.03	1.06	0.93
7.	Transportation	4	174.75	107.16	354.34	0.24	0.14	0.45
8.	Industrial Machinery	7	147.85	78.26	245.32	0.81	0.43	1.01
9.	Machine Tools	3	465.06	614.31	606.73	2.95	3.61	2.68
10.	Agricultural Machinery	2	169.11	159.02	168.19	0.91	0.78	0.62
11.	Earth Moving Machinery	0	0.00	0.00	0.00	0.00	0.00	0.00
12.	Misc. Mechanical Engg. Industries	1	29.00	14.50	25.00	32.95	15.93	26.32
13.	Commercial, Office, Household Equipment	0	0.00	0.00	0.00	0.00	0.00	0.00
14.	Medical & Surgical Equipment	0	0.00	0.00	0.00	0.00	0.00	0.00
15.	Industrial Equipment	1	169.02	155.75	232.19	2.34	1.81	2.21
16.	Scientific Instruments	0	0.00	0.00	0.00	0.00	0.00	0.00
17.	Math. Surveying & Drawing Instrument	1	16.62	16.15	23.67	1.78	2.09	2.47
18.	Fertilizer	6	911.66	1000.35	1142.17	0.45	0.48	0.40
19.	Chemicals (other than fertilizers)	6	685.56	1101.62	1327.99	0.67	0.90	0.96
20.	Photographic Raw Film & Paper	1	85.55	304.91	105.00	0.72	2.22	0.70
21.	Dyestuffs	0	0.00	0.00	0.00	0.00	0.00	0.00
22.	Drugs & Pharmaceuticals	6	420.61	382.70	422.96	1.58	1.60	1.53
23.	Textiles (Dyed, Printed, Processed)	2	58.09	76.06	162.20	0.41	0.50	1.01
24.	Paper & Pulp	1	35.00	29.30	32.50	0.64	0.53	0.54
25.	Sugar	0	0.00	0.00	0.00	0.00	0.00	0.00
26.	Fermentation Industries	0	0.00	0.00	0.00	0.00	0.00	0.00
27.	Food Processing Industries	1	3.35	2.14	4.13	0.08	0.05	0.09
28.	Vegetable Oil & Vanaspati	0	0.00	0.00	0.00	0.00	0.00	0.00
29.	Soaps, Cosmetics, Toilet Preparations	1	3.87	4.25	8.30	0.09	0.10	0.11
30.	Rubber Goods	1	8.14	9.42	7.81	0.70	0.50	0.39
31.	Leather, Leather goods & Pickers	0	0.00	0.00	0.00	0.00	0.00	0.00
32.	Glue & Gelatin	0	0.00	0.00	0.00	0.00	0.00	0.00
33.	Glass	1	1.62	1.64	13.65	1.78	1.62	6.04
34.	Ceramics	1	2.44	4.26	6.46	0.25	0.41	0.47
35.	Cement & Gypsum	2	60.81	98.77	157.88	0.26	0.36	0.45
36.	Timber Products	0	0.00	0.00	0.00	0.00	0.00	0.00
37.	Defence Industries	8	6103.62	8391.58	12970.30	5.32	6.60	8.60
38.	Miscellaneous Industries	2	599.97	984.59	1046.67	3.15	4.97	4.31
Total		121	23569.89	28846.55	36131.56	0.63	0.69	0.77

Source : Data collected and compiled by DST.

Note : S.T.O. : Sales Turnover

Table 12
R&D EXPENDITURE BY INDUSTRY GROUPS FOR PRIVATE SECTOR INDUSTRIES

(Rs. Lakhs)

Sl. No.	Industry Group	Number of Industries	Total R&D Expenditure			R&D Expenditure As % of S.T.O.		
			1986-87	1987-88	1988-89	1986-87	1987-88	1988-89
1.	Metallurgical Industries	56	1245.16	1397.28	2263.64	0.28	0.28	0.39
2.	Fuels	8	153.17	101.70	168.05	0.48	0.30	0.47
3.	Boilers & Steam Generating Plants	3	45.36	40.46	55.58	0.34	0.34	0.34
4.	Prime Movers	3	304.44	431.52	432.29	1.15	1.22	1.60
5.	Electronic & Electrical Equipment	146	4368.97	4944.23	5577.50	0.86	0.82	1.01
6.	Telecommunication	32	530.33	383.88	548.32	2.05	1.74	1.37
7.	Transportation	35	1858.14	2088.90	2419.25	0.62	0.63	0.69
8.	Industrial Machinery	79	2189.04	2570.49	2720.72	0.31	0.31	0.25
9.	Machine Tools	15	275.92	356.24	329.95	0.28	0.33	0.21
10.	Agricultural Machinery	6	298.04	312.49	493.90	0.48	0.45	0.57
11.	Earth Moving Machinery	1	0.67	0.82	1.70	0.14	0.14	0.25
12.	Misc. Mechanical Engg. Industries	6	87.23	77.78	93.98	0.82	0.65	0.65
13.	Commercial, Office, Household Equipment	6	230.47	238.01	695.61	0.52	0.42	1.03
14.	Medical & Surgical Equipment	2	37.26	39.75	50.25	2.83	2.35	2.06
15.	Industrial Equipment	31	1112.45	211.27	247.43	9.73	2.04	1.89
16.	Scientific Instruments	11	153.95	160.04	203.35	1.09	1.06	0.86
17.	Math. Surveying & Drawing Instrument	2	34.60	36.18	28.83	6.78	6.03	3.93
18.	Fertilizer	2	92.51	155.81	223.60	0.22	0.40	0.48
19.	Chemicals (other than fertilizers)	156	4053.22	4395.94	5336.61	0.95	0.89	0.97
20.	Photographic Raw Film & Paper	2	27.92	10.94	15.30	1.61	0.56	0.68
21.	Dyestuffs	10	359.50	434.39	518.44	0.76	0.92	0.93
22.	Drugs & Pharmaceuticals	78	4216.21	4719.17	5177.49	1.82	1.76	1.60
23.	Textiles (Dyed, Printed, Processed)	27	1216.38	1191.76	1213.64	0.33	0.24	0.35
24.	Paper & Pulp	12	163.13	150.99	166.21	0.37	0.33	0.35
25.	Sugar	13	334.59	439.47	418.06	0.48	0.54	0.44
26.	Fermentation Industries	5	38.49	37.98	54.88	0.13	0.12	0.19
27.	Food Processing Industries	20	927.89	974.99	1091.58	1.59	1.32	1.34
28.	Vegetable Oil & Vanaspati	2	13.52	18.78	19.61	0.06	0.09	0.08
29.	Soaps, Cosmetics, Toilet Preparations	7	867.68	836.55	840.56	0.64	0.52	0.50
30.	Rubber Goods	13	628.42	763.90	966.61	0.31	0.30	0.35
31.	Leather, Leather goods & Pickers	0	0.00	0.00	0.00	0.00	0.00	0.00
32.	Glue & Gelatin	3	44.15	13.83	29.66	0.24	0.06	0.11
33.	Glass	4	38.61	35.15	35.28	0.53	0.54	0.45
34.	Ceramics	10	267.32	281.40	376.97	1.19	1.19	1.26
35.	Cement & Gypsum	3	525.89	572.34	596.36	0.57	0.59	0.56
36.	Timber Products	2	23.03	50.74	34.00	0.34	0.67	0.42
37.	Defence Industries	0	0.00	0.00	0.00	0.00	0.00	0.00
38.	Miscellaneous Industries	17	216.45	228.75	210.05	0.33	0.14	0.13
Total		828	26980.11	28703.92	33655.27	0.64	0.58	0.62

Source : Data collected and compiled by DST.

Note : S.T.O. : Sales Turnover

31080.72

Table 13
R&D EXPENDITURE BY OBJECTIVES

(Rs. Lakhs)

Objective	Central Government				State Governments				Private Sector				Total		
	1986-87	1987-88	1988-89	1988-89	1986-87	1987-88	1988-89	1988-89	1986-87	1987-88	1988-89	1988-89	1986-87	1987-88	1988-89
Exploration and Assessment of Earth, Seas, Atmosphere Space	6200.74	6294.46	8412.78	8412.78	143.65	155.11	142.04	142.04	-	-	-	-	6344.39	6449.57	8554.82
Development of Agriculture	30999.09	36628.00	43210.00	43210.00	-	-	-	-	-	-	-	-	30999.09	36628.00	43210.00
Forestry and Fishing	22035.33	23814.43	28461.91	28461.91	15963.54	17879.06	22754.08	22754.08	1450.73	1530.24	1768.06	1768.06	39449.60	43223.73	52984.05
Promotion of Industrial Development	26826.39	32218.06	39053.87	39053.87	234.84	242.57	256.00	256.00	14543.15	15242.93	18511.11	18511.11	41604.38	47703.56	57820.98
Production, Conservation and Distribution of Energy	24211.80	23866.88	23690.53	23690.53	3.66	6.48	4.05	4.05	3661.38	4173.55	4448.39	4448.39	27876.84	28046.91	28142.97
Development of Transport and Communication	8391.88	9898.75	12618.34	12618.34	4.26	3.86	2.15	2.15	2858.93	2781.88	3442.65	3442.65	11255.07	12684.49	16063.14
Development of Education Services	2802.00	3386.81	3208.65	3208.65	-	-	-	-	-	-	-	-	2802.00	3386.81	3208.65
Development of Health Services	8217.36	9096.17	10041.47	10041.47	80.96	60.08	76.01	76.01	4296.96	4813.22	5289.62	5289.62	12595.28	13969.47	15407.10
Social Development and other Socio-Economic Services	2692.43	3091.30	3793.71	3793.71	25.40	44.69	56.53	56.53	5.19	5.43	5.71	5.71	2723.02	3141.42	3855.95
Protection of the Environment	9011.11	12335.32	14642.93	14642.93	-	-	-	-	27.35	36.38	17.52	17.52	9038.46	12371.70	14660.45
General Advancement of Knowledge	12525.07	19055.92	27989.53	27989.53	-	-	-	-	54.82	20.46	57.40	57.40	12579.89	19076.38	28046.93
Other aims	844.45	1287.08	1596.86	1596.86	-	-	-	-	81.60	99.83	114.80	114.80	926.05	1386.91	1711.66
Defence	49210.10	63302.08	70790.80	70790.80	-	-	-	-	-	-	-	-	49210.10	63302.08	70790.80
Total	203967.75	244275.26	287511.38	287511.38	16456.31	18391.85	23290.86	23290.86	26980.11	28703.92	33655.26	33655.26	247404.17	291371.03	344457.50

Source : Data collected and compiled by DST.

Table 14
R&D EXPENDITURE BY FIELD OF SCIENCE
(Rs. Lakhs)

Field of Science	Central Government			State Governments			Private Sector			Total		
	1986-87	1987-88	1988-89	1986-87	1987-88	1988-89	1986-87	1987-88	1988-89	1986-87	1987-88	1988-89
Natural Sciences	104882.52	127850.74	142066.46	541.49	335.75	369.59	7001.15	7542.19	8808.08	112225.16	135528.68	151244.13
Engineering & Technology	73608.04	88954.54	114125.80	428.21	669.97	1113.24	14805.49	15585.85	18497.04	88841.74	105210.16	133736.08
Medical Sciences	6773.63	7643.30	8264.06	82.60	61.77	77.20	4302.52	4829.48	5326.80	11160.75	12534.55	13668.06
Agricultural Sciences	18646.21	19767.95	22987.82	15603.99	17324.37	21730.84	870.95	946.40	1023.34	35121.15	38038.72	45742.00
Others	55.37	58.95	67.22	—	—	—	—	—	—	55.37	58.95	67.22
Total	203967.77	244275.28	287511.36	16456.29	18391.86	23290.87	26980.11	28703.92	33655.26	247404.17	291371.06	344457.49

Source : Data collected and compiled by DST.

28751.36
23291.06
31080.45

Table 15
FULL TIME EQUIVALENT OF MANPOWER EMPLOYED IN R&D ESTABLISHMENTS AS ON 1.4.1988

Name of Establishment	Personnel engaged Primarily in R&D Activities	Personnel engaged in Auxiliary Activities	Personnel engaged in Administrative Activities	Total
A. INSTITUTIONAL SECTOR				
Department of Atomic Energy	8700	9238	6446	\$27719
Council of Scientific & Industrial Research	6553	14003	5952	26508
Defence Research & Development Organisation	+7950	+7600	+8213	+23763
Indian Council of Agricultural Research	4349	6158	16850	27357
Department of Space	8519	1870	4848	15237
Indian Council of Medical Research	605	854	1011	2470
Other Central Government Ministries/Agencies	7251	12539	12344	32134
State Governments	21855	8624	19023	49502
B. INDUSTRIAL SECTOR				
Public Sector including Joint Sector	12652	@9747	@5212	27611
Private Sector	18493	10323	@6499	35315
Total	96927	80956	86398	267616

Source : Data collected and compiled by DST.

- Note :
1. + A number of Research Laboratories have not provided data, these figures have been reproduced from the report for the year 1982-83.
 2. @ Figures indicated in 1984-85 report have been adopted on account of non-response.
 3. \$ Professional status of 3335 personnel not known.

Table 16
EDUCATIONAL BACKGROUND OF FEMALE S&T PERSONNEL ENGAGED IN R&D ACTIVITIES
AS ON 1.4.1988

Level of Qualifications	Natural Sciences	Agricultural Sciences	Engg. & Technology	Medical Sciences	Social Sciences	Total
Ph.Ds	464	132	37	20	11	664 (13.6)
Post-Graduates	791	413	267	123	133	1727 (35.3)
Graduates	442	43	598	98	46	1227 (25.1)
Diploma Holders	0	0	384	1	0	385 (7.8)
Others	135	501	240	5	9	890 (18.2)
Total	1832 (37.4)	1089 (22.3)	1526 (31.2)	247 (5.0)	199 (4.1)	4893 (100.0)

Source : Data collected and compiled by DST.

Note : Figures in brackets indicate percentages.

Table 17
EDUCATIONAL QUALIFICATIONS OF PERSONNEL ENGAGED IN R&D AS ON 1-6-88

Discipline Sector	Ph. Ds.						Post Graduates						Nat. Sc.	Agri. Sc.
	Nat. Sc.	Agri. Sc.	Engg. Sc.	Med. Sc.	Soc. Sc.	Total	Nat. Sc.	Agri. Sc.	Engg. Sc.	Med. Sc.	Soc. Sc.	Total		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
A. Institutional Sector														
1. DAE	622	4	30	13	0	669	1329	12	208	142	3	1694	968	13
2. CSIR	1636	79	338	7	10	2070	1384	55	718	15	47	2219	614	64
3. DRDO	171	0	12	3	12	198	527	3	282	4	36	852	455	2
4. ICAR	248	1052	48	0	53	1401	298	857	91	2	97	1345	38	16
5. ICMR	45	0	0	12	8	65	54	0	0	26	44	124	46	0
6. DST	219	3	7	8	15	252	138	2	24	51	134	349	96	0
7. Space	0	0	39	0	0	39	0	0	294	0	0	294	0	0
8. Environment	7	0	0	0	0	7	10	0	0	0	0	10	1	0
9. Other Instt. under the Central Govt.	246	27	278	43	11	605	768	75	391	272	45	1551	387	29
10. State Govts.	205	2697	29	30	22	2983	305	5230	156	81	136	5908	107	720
B. Industrial Sector														
1. Public Sector	397	15	262	6	0	680	536	9	1532	5	7	2089	620	7
2. Private Sector	897	58	350	60	3	1368	1995	113	1705	132	20	3965	2465	125
Total	4693	3935	1393	182	134	10337	7344	6356	5401	730	569	20400	5797	976

Source : Data collected and compiled by DST

Graduates			Diploma Holders				Others						Total					
Engg. Sc.	Med. Sc.	Soc. Sc.	Total	Engg. Sc.	Med. Sc.	Total	Nat. Sc.	Agri. Sc.	Engg. Sc.	Med. Sc.	Soc. Sc.	Total	Nat. Sc.	Agri. Sc.	Engg. Sc.	Med. Sc.	Soc. Sc.	Total
16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
1028	76	0	2085	604	0	604	0	0	158	0	0	158	2919	29	2028	231	3	5210
442	13	8	1141	196	0	196	36	38	123	1	6	204	3670	236	1817	36	71	5830
741	1	0	1199	922	1	923	623	0	672	3	1	1299	1776	5	2629	12	49	4471
20	0	79	153	6	0	6	212	230	16	0	12	470	796	2155	181	2	241	3375
0	9	3	58	0	0	0	22	0	0	3	2	27	167	0	0	50	57	274
28	6	51	181	0	0	0	48	0	18	0	7	73	501	5	77	65	207	855
44	4	0	48	0	0	0	0	0	0	0	0	0	0	0	377	4	0	381
0	0	0	1	0	0	0	0	0	0	0	0	0	18	0	0	0	0	18
1011	214	33	1674	704	0	704	254	3	638	15	10	920	1655	134	3022	544	99	5454
242	32	2	1103	55	1	56	126	4696	14	5	32	4873	743	13343	496	149	192	14923
3563	3	37	4230	1818	0	1818	472	3	3260	0	45	3780	2025	34	10435	14	89	12597
4341	124	118	7173	2251	3	2254	972	69	2359	68	63	3531	6329	365	11006	387	204	18291
11460	482	331	19046	6556	5	6561	2765	5039	7258	95	178	15335	20599	16306	32068	1494	1212	71679

Table 18
SALARY STRUCTURE OF S&T PERSONNEL ENGAGED IN R&D IN THE GOVERNMENT SECTOR AS ON 1.4.1988

Salary Scale	Number of Personnel		Total
	Central Government	State Governments	
Less than Rs. 1400	3127 (11.3)	5025 (25.5)	8152 (17.2)
Rs. 1400 – Rs. 2600	2899 (10.5)	1127 (5.7)	4026 (8.5)
Rs. 1640 – Rs. 2900	1902 (6.9)	2046 (10.4)	3948 (8.3)
Rs. 2200 – Rs. 4000	7632 (27.6)	6782 (34.5)	14414 (30.5)
Rs. 3000 – Rs. 4500	5936 (21.5)	95 (0.5)	6031 (12.7)
Rs. 3700 – Rs. 5000	3983 (14.4)	3286 (16.7)	7269 (15.4)
Rs. 5100 – Rs. 6300	1781 (6.4)	1318 (6.7)	3099 (6.6)
Rs. 5900 – Rs. 7300	370 (1.3)	1 Neg.	371 (0.8)
Rs. 7300 – Rs. 7600	15 (0.05)	–	15 Neg.
Rs. 7600 and more	6 (0.02)	–	6 Neg.
Total	27651 (100.0)	19680 (100.0)	47331 (100.0)

Source : Data collected and compiled by DST.

- Note :
1. Figures in brackets indicate percentages.
 2. Based on average pay scale.
 3. Based on response received.
 4. Neg. = Negligible.
 5. – = Nil.

Table 19
SALARY STRUCTURE OF R&D PERSONNEL EMPLOYED IN PUBLIC SECTOR AS ON 1.4.1988

Salary Scale	No. of personnel in position
Less than Rs. 1000	1482 (12.5)
Rs. 1000 to Rs. 2000	5898 (49.6)
Rs. 2000 to Rs. 3000	2974 (24.9)
Rs. 3000 to Rs. 4000	848 (7.1)
Rs. 4000 to Rs. 5000	487 (4.1)
Rs. 5000 to Rs. 6000	165 (1.4)
Rs. 6000 to Rs. 7000	40 (0.3)
Rs. 7000 to Rs. 8000	7 (0.06)
More than Rs. 8000	1 (0.01)
Total	11902 (100.0)

Source : Data collected and compiled by DST.

- Note :
1. Figures in bracket indicate the percentages.
 2. Based on response received.

Table 20
SALARY STRUCTURE OF R&D PERSONNEL EMPLOYED IN PRIVATE SECTOR AS ON 1.4.1988

Salary Scale	No. of personnel in position
Less than Rs. 1000	1174 (6.8)
Rs. 1000 to Rs. 2000	4241 (24.7)
Rs. 2000 to Rs. 3000	4311 (25.1)
Rs. 3000 to Rs. 4000	3323 (19.4)
Rs. 4000 to Rs. 5000	2065 (12.0)
Rs. 5000 to Rs. 6000	1065 (6.2)
Rs. 6000 to Rs. 7000	536 (3.1)
Rs. 7000 to Rs. 8000	214 (1.2)
More than Rs. 8000	247 (1.5)
Total	17176 (100.0)

Source : Data collected and compiled by DST.

- Note :
1. Figures in bracket indicate the percentages.
 2. Based on response received.

Table 21
STOCK OF SCIENTIFIC AND TECHNICAL PERSONNEL 1950-1980

(Thousand)

Category of Personnel	Stock at the end of the Year					
	1950	1955	1960	1965	1970	1980 Estimated
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(a) Engineering & Technology						
(i) Degree	21.6	37.5	62.2	106.7	185.4	221.4
(ii) Diploma	31.5	46.8	75.0	138.9	244.4	329.4
(b) Science						
(i) Post Graduates	16.0	28.0	47.7	85.7	139.2	217.5
(ii) Graduates	60.0	102.9	165.6	261.5	420.0	750.3
(c) Agriculture						
(i) Post Graduates	1.0	2.0	3.7	7.7	13.5	96.5@
(ii) Graduates	6.9	11.5	20.2	39.4	47.2	—
(d) Medicine						
(i) Degree	18.0	29.0	41.6	60.6	97.8	165.4
(ii) Licentiate	33.0	35.0	34.0	31.0	27.0	2.2*
Total	188.0	292.7	450.0	731.5	1174.5	1782.7

Source : Columns (2) to (6) Division of Scientific and Technical Personnel, CSIR. Col. (7) Sixth Five Year Plan, 1980-85, Planning Commission.

Note : 1. During the years, 1980, the number of B.Sc.s, who were also B.Ed.s were estimated to be 1.66 lakhs. Similar figures for the earlier years are not available.
2. * Represents B.Sc. (Nursing) Particulars regarding number of Licentiates not available.
3. @ Including Graduates.

Table 22
ESTIMATED STOCK, NUMBER OF ECONOMICALLY ACTIVE S&T PERSONNEL IN 1985 AND 1990

(Thousand)

Sl. No.	Category	At the Beginning of 1985		At the Beginning of 1990	
		Stock of manpower	Economically Active population	Stock of manpower	Economically Active population
1.	Engineering Degree Holders	372.6	324.2	454.4	395.3
2.	Engineering Diploma Holders	564.2	490.9	734.8	639.3
3.	Medical Graduates	258.7	225.1	302.4	263.1
4.	Dental Surgeons	9.5	8.3	12.0	10.4
5.	Nurses (B.Sc.)	3.7	3.7	5.5	5.4
6.	Agricultural Graduates	133.3	104.0	162.8	127.0
7.	Veterinary Graduates	28.3	24.6	33.4	29.1
8.	Science Graduates	1138.3	887.9	1339.4	1044.7
9.	Science Post Graduates	350.3	273.2	419.7	327.4
10.	*B.Ed. (B.Sc.)	280.7	218.9	344.8	269.0
Total		3139.6	2560.8	3809.2	3110.7

Source : Seventh Five Year Plan, 1985-90 Vol. II, Planning Commission.

Note : * Estimated on the assumption that 25% of Education graduates would be with Science background.

Table 23
OUT-TURN OF SCIENTIFIC AND TECHNICAL PERSONNEL FROM
UNIVERSITIES/IIT'S IN INDIA 1947-1983

Year	Natural Sciences				Engineering & Technology					
	B.Sc.	M.Sc./ MA/ M.Tech	M.Phil	Ph.D/ D.Sc	BE/ B.Sc	Diploma Holders	B.E. *	P.G. Diploma	M.E./ M.Tech./ M.Pharm./ M.Arch.	Ph.D/ D.Sc.
1947	5996	872	—	25	1076	1851	—	—	13	—
1948	6270	1053	—	56	1251	1393	—	2	26	—
1949	7654	1168	—	64	1544	1473	—	8	28	1
1950	9628	1438	—	79	2029	2035	—	11	39	—
1951	11,193	1856	—	81	2657	2841	—	16	55	2
1952	11,087	2146	—	119	2882	2836	5	16	54	1
1953	12,329	2425	—	103	2841	2786	11	18	59	—
1954	14,422	2891	—	183	3304	3485	1	14	92	3
1955	15,964	3073	—	202	3947	3999	7	23	102	4
1956	16,126	3226	—	181	4191	3910	6	38	188	6
1957	18,045	3771	—	197	4248	5157	4	47	205	4
1958	18,920	3807	—	221	4237	6278	6	33	279	3
1959	20,627	4741	—	280	4679	7249	9	52	412	6
1960	22,693	5365	—	324	5660	7862	33	58	512	7
1961	26,157	6598	—	363	7035	10,244	69	34	600	11
1962	26,930	7184	—	386	8233	12,042	112	46	748	15
1963	35,015	8023	—	493	9005	12,938	283	64	891	13
1964	34,046	8832	—	472	9415	15,202	521	84	710	29
1965	38,150	9460	—	541	8277	17,633	827	123	947	8
1966	42,465	8269	1	746	13,015	16,025	1046	111	1168	62
1967	49,769	9216	2	897	13,841	20,105	1198	188	1273	65
1968	59,606	10,685	—	1005	15,771	23,204	1308	235	1622	88
1969	72,432	13,116	3	1070	15,642	21,700	1620	261	1886	97
1970	82,610	13,214	1	1163	17,748	18,189	1505	229	1982	125
1971	100,773	14,964	8	1170	18,206	16,481	1769	267	1996	112
1972	110,606	16,213	5	1284	16,597	14,897	1540	268	2018	155
1973	106,695	18,272	5	1335	16,255	13,387	1660	337	2043	162
1974	121,451	18,868	27	1455	14,158	14,899	1690	325	2069	151
1975	93,567	18,469	22	1592	15,337	17,810	1817	357	2207	256
1976	95,901	18,212	23	1670	15,021	20,615	1905	343	2291	258
1977	114,525	16,798	52	2015	15,780	23,871	1522	298	2301	289
1978	116,596	18,326	21	2045	16,527	26,763	1549	307	2319	217
1979	123,379	19,393	111	2070	18,156	30,075	1503	305	2675	279
1980	124,800	19,812	161	2416	18,865	30,124	1548	299	2680	265
1981	125,030	21,339	144	2670	19,947	32,577	1294	264	2816	281
1982	129,000	22,812	252	2689	21,200	33,533	1291	270	3160	310
1983	131,400	22,781	208	2718	23,086	32,871	1372	244	3441	337

Source : Report on out-turn of Scientific and Technical Manpower (Volume-I to IV),
Division for Scientific and Technical Personnel, Council of Scientific and Industrial Research.

Note : * Engineering Graduate from Professional Societies/Institutions.

(Number)

Medical Sciences					Agriculture & Veterinary Sciences						Total
M.B.B.S.	D.M./ M.Ch.	P.G. Diploma	M.D./ M.S.	Ph.D./ D.Sc.	B.Sc. (Ag.)	B.V.Sc.	M.Sc. (Ag.)	M.V.Sc.	Ph.D./ D.Sc. (Veterinary & Dairy Science)	Ph.D.	
617	—	113	38	—	570	—	79	—	2	—	11,252
959	—	135	35	—	583	—	94	—	2	—	11,859
1170	—	133	31	—	1000	—	119	—	—	—	14,393
1550	—	136	28	—	1000	100	154	—	4	—	18,231
1557	—	181	45	—	1041	189	192	—	5	—	21,911
1896	—	163	66	—	870	172	223	—	8	—	22,544
2164	—	196	84	—	879	209	222	—	4	—	24,330
2229	—	167	86	—	910	256	203	—	7	—	28,253
2582	—	213	107	—	905	289	197	—	9	—	31,623
2743	—	247	121	—	893	368	209	—	13	—	32,466
2732	—	312	199	—	1128	492	309	—	7	—	36,857
2802	—	346	244	—	1520	643	306	—	9	—	39,654
2839	—	403	294	—	1950	821	383	—	16	—	44,761
3119	2	411	341	—	1990	844	482	—	26	—	49,709
3387	2	449	406	—	2608	857	610	—	28	—	59,458
3900	1	518	570	—	2609	774	690	—	42	—	64,800
3945	5	534	617	3	4112	802	708	—	41	—	77,492
4289	6	620	637	2	4718	999	814	—	48	—	81,444
4452	4	650	829	3	5569	1030	1176	—	95	—	89,774
5387	2	795	1025	7	5040	855	939	132	69	3	97,162
6558	6	734	1129	4	6180	1120	920	135	7	2	113,349
7628	22	806	1164	9	5902	1003	1238	139	89	15	131,539
8916	22	819	1292	2	5909	1145	1288	122	96	10	147,448
9315	20	923	1432	9	7205	1171	1432	149	178	39	158,639
10,407	27	1010	1546	17	5280	1013	1159	226	58	22	176,511
10,825	35	1019	1631	12	5600	1012	1454	194	256	27	185,648
11,311	41	1162	2019	25	4649	904	1281	208	110	35	181,896
11,364	26	1267	1955	25	4550	1018	1394	244	194	65	197,195
11,911	49	1449	2203	26	3851	892	1365	253	195	56	173,684
11,982	45	1644	2548	27	4700	1143	1462	271	230	59	180,350
11,962	54	1845	2775	34	4306	1183	1347	286	241	54	201,538
13,787	66	2040	2938	40	5075	1060	1337	307	286	58	211,664
12,190	93	2254	3475	34	5166	925	1585	237	300	64	224,269
13,083	94	2499	3890	42	5959	1347	1674	346	331	71	230,306
12,170	110	2604	3881	54	5986	1349	1620	360	419	82	234,997
12,278	134	2710	3872	30	6061	1336	1725	371	385	105	243,524
11,900	156	2720	4507	35	6019	1357	1592	294	471	76	247,585

Table 24
UNIVERSITIES/COLLEGES AND THEIR ENROLMENT FROM 1976-77 TO 1987-88

(Number)

Year	Universities	Institutions Deemed to be Universities	Colleges	Total Enrolment
1976-77	105	10	4317	24,31,563
1977-78	105	10	4375	25,64,972
1978-79	108	10	4460	26,18,228
1979-80	108	11	4558	26,48,579
1980-81	112	11	4722	27,52,437
1981-82	118	13	4880	29,52,066
1982-83	120	13	5039	31,33,093
1983-84	124	15	5246	33,22,939
1984-85	125	15	5590	34,04,096
1985-86	132	17	5816	35,70,897*
1986-87	136	19	6512	36,81,870*
1987-88	142	22	6597**	38,14,417*

Source : Annual Report of University Grants Commission 1987-88.

- Note : 1. The number of Universities/Deemed Universities given above does not include 'Institute' of National Importance which are of Universities Status.
 2. The number of colleges given above excludes junior colleges and those offering diploma certificate courses.
 3. * Estimated.
 4. ** Provisional.

Table 25
ENROLMENT FACULTY - WISE IN HIGHER EDUCATION FROM 1983-84 TO 1987-88

(Number)

Course of study	1983-84		1984-85		1985-86		1986-87		1987-88	
	Enrol- ment	Percent- age of total	Enrol- ment	Percent- age of total	Enrol- ment (esti- mated)	Percent- age of total	Enrol- ment (esti- mated)	Percent- age of total	Enrol- ment (esti- mated)	Percent- age of total
Arts (including oriental Learning)	13,38,106	40.4	13,72,277	40.3	14,39,071	40.3	14,83,794	40.3	15,37,210	40.3
Science	6,53,092	19.7	6,69,563	19.7	7,03,467	19.7	7,25,328	19.7	7,51,440	19.7
Commerce	7,03,638	21.3	7,38,506	21.7	7,67,743	21.5	7,91,602	21.5	8,20,100	21.5
Education	74,679	2.3	76,522	2.2	82,131	2.3	84,683	2.3	87,732	2.3
Engineering/Technology	1,53,131	4.6	1,59,046	4.7	1,64,261	4.6	1,69,366	4.6	1,75,463	4.6
Medicine	1,18,989	3.6	1,18,890	3.5	1,28,552	3.6	1,32,547	3.6	1,37,319	3.6
Agriculture	41,588	1.3	41,741	1.2	46,422	1.3	47,864	1.3	49,587	1.3
Veterinary Science	9,268	0.3	9,413	0.3	10,713	0.3	11,046	0.3	11,440	0.3
Law	1,94,555	5.9	1,95,708*	5.7	2,07,112	5.8	2,13,549	5.8	2,21,236	5.8
Others	20,603	0.6	22,430	0.7	21,425	0.6	22,091	0.6	22,887	0.6
Total	33,07,649	100.0	34,04,096	100.0	35,70,897	100.0	36,81,870	100.0	38,14,417	100.0

Source : Annual Report of University Grants Commission 1987-88

Table 26
FACULTY-WISE ENROLMENT OF WOMEN IN HIGHER EDUCATION FROM 1974-75 TO 1987-88

(Thousand)

Year	Arts	Commerce	Law	Education	Science	Agriculture	Vety. Sc.	Medicine	Engineering	Others	Total
1974-75	363.0 (34.0)	22.1 (5.6)	5.9 (4.4)	29.0 (37.6)	106.2 (22.9)	0.3 (0.9)	0.08 (1.2)	21.0 (19.7)	1.3 (1.5)	4.1 (32.6)	553.0 (23.4)
1975-76	392.1 (36.4)	27.6 (6.6)	7.0 (5.0)	30.1 (39.3)	111.7 (24.1)	0.4 (1.4)	0.09 (1.4)	19.2 (18.3)	2.1 (2.1)	4.2 (36.1)	595.2 (24.5)
1976-77	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	637.3 (25.8)
1979-80	397.9 (37.0)	68.0 (13.2)	11.0 (6.2)	34.5 (47.3)	140.1 (27.5)	1.1 (2.8)	0.2 (2.7)	24.4 (21.8)	4.4 (3.7)	7.4 (38.8)	689.0 (26.0)
1980-81	420.3 (37.7)	88.1 (15.9)	11.9 (6.9)	33.7 (47.3)	153.9 (28.8)	1.3 (3.3)	0.2 (3.3)	26.8 (24.4)	4.9 (3.8)	7.4 (39.8)	748.5 (27.2)
1981-82	455.0 (38.2)	105.0 (16.7)	12.3 (7.1)	34.4 (48.3)	165.7 (28.6)	1.4 (3.5)	0.3 (4.3)	29.8 (26.2)	5.9 (4.5)	7.0 (38.8)	816.7 (27.7)
1982-83	487.6 (38.7)	116.8 (17.4)	13.6 (7.4)	34.9 (47.0)	179.7 (28.8)	1.6 (4.0)	0.4 (4.8)	31.6 (27.8)	7.2 (5.0)	6.7 (36.9)	880.1 (28.1)
1983-84	517.0 (38.6)	131.4 (18.7)	15.2 (7.8)	35.3 (47.3)	189.7 (29.0)	1.7 (4.1)	0.5 (5.1)	33.7 (28.3)	8.5 (5.5)	7.3 (35.7)	940.3 (28.4)
1984-85	540.7 (39.4)	142.2 (19.3)	15.7 (8.0)	36.6 (47.8)	200.6 (30.0)	2.0 (4.9)	0.5 (5.4)	35.2 (29.6)	10.0 (6.3)	8.5 (37.9)	992.1 (29.1)
1985-86*	581.8 (40.4)	146.7 (19.1)	16.7 (8.1)	40.2 (49.0)	214.6 (30.5)	2.0 (4.3)	0.5 (4.9)	37.9 (29.5)	9.6 (5.9)	8.5 (39.5)	1058.6 (29.6)
1986-87*	618.5 (41.6)	155.9 (19.7)	17.8 (8.3)	42.8 (50.5)	228.1 (31.4)	2.1 (4.5)	0.6 (5.1)	40.3 (30.4)	10.2 (6.0)	9.0 (40.7)	1125.3 (30.6)
1987-88*	656.8 (42.7)	155.7 (20.2)	18.9 (8.5)	45.4 (51.8)	242.2 (32.2)	2.3 (4.6)	0.6 (5.2)	42.8 (31.1)	10.9 (6.2)	9.6 (41.8)	1195.1 (31.3)

Source : Annual Report of University Grants Commission 1987-88.

Note : 1. Figures in brackets indicate the enrolment of women as a Percentage of total enrolment.

2. * Estimated.

3. N.A. = Not available.

Table 27
MAJOR RESEARCH PROJECTS FUNDED BY UNIVERSITY GRANTS COMMISSION IN SCIENCE AND ENGINEERING/TECHNOLOGY BY SUBJECTS (1974-1988)

(Number)

Subjects	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987*	1988*	Total	%
Physics	10	63	36	44	28	37	19	64	54	41	21	28	12	45	29	531	16.03
Chemistry	18	100	58	72	46	81	28	60	69	69	53	107	53	49	94	957	28.90
Biosciences	9	88	101	85	79	126	57	163	92	92	108	157	133	N.A.	55	1345	40.60
Geology	2	23	4	14	8	3	14	7	19	8	12	11	1	1	4	131	3.95
Geography	N.A.	N.A.	8	10	2	3	7	4	7	2	12	8	7	N.A.	11	81	2.44
Mathematics & Statistics	N.A.	18	3	4	4	10	5	8	14	11	16	24	9	7	6	139	4.19
Engineering & Technology	N.A.	N.A.	33	22	10	10	10	18	2	2	22	N.A.	N.A.	N.A.	N.A.	129	3.89
Total	39	292	243	251	177	270	140	324	257	225	244	335	215	102	199	3313	100.00

Source : 1. Bulletin of Higher Education, University Grants Commission, December 1984.

2. Annual Report of University Grants Commission 1982-83, 83-84, 84-85 and 1985-86.

3. * University Grants Commission (Unpublished estimated data)

Note : 1. N.A. = Not available.

Table 28
DISTRIBUTION OF COLLEGES ACCORDING TO COURSES OF STUDY : 1983-84 TO 1987-88

(Number)

Course of Study	1983-84*	1984-85*	1985-86*	1986-87*	1987-88**
Arts, Science and Commerce	3,758	4,004	4,132	4,354	4,428
Technical/Professional Break up	563	618	655	695	719
(a) Engineering/Technology	191	223	242	253	257
(b) Medicine/Pharmacy/Ayurveda/Nursing/ Dentistry/Homoeopathy	286	303	320	342	361
(c) Agriculture	58	63	63	67	68
(d) Veterinary Science	28	29	30	33	33
Law	186	194	199	202	204
Physical Education & Education	391	430	441	479	470
Oriental Learning	283	277	321	720	714
Music/Fine Arts	65	67	68	62	62
Total	5246	5590	5816	6512	6597

Source : Annual Report of University Grants Commission 1987-88.

Note : 1. * Excludes Junior Colleges and Colleges having only Diploma/Certificate Course.
2. ** Provisional.

Table 29
UNIVERSITY-WISE LIST OF CENTRES OF ADVANCED STUDY IN SCIENCE, ENGINEERING AND TECHNOLOGY
AS ON 31.3.1987

Sl. No.	University	Name of the CAS
1.	Annamalai	(1) Marine Biology
2.	Banaras Hindu	(1) Zoology (2) Botany (3) Metallurgical Engg.
3.	Bombay	(1) Applied Chemistry (2) Mathematics
4.	Calcutta	(1) Botany (2) Chemistry (3) Radio Physics & Electronics (4) Applied Mathematics
5.	Delhi	(1) Botany (2) Zoology (3) Physics (4) Chemistry
6.	I.I.Sc. Bangalore	(1) Molecular Biophysics (2) Bio-Chemistry (3) Inorganic & Physical Chemistry (4) Solid State Chemistry (5) Physics
7.	Jadavpur	(1) Geology
8.	Madras	(1) Maths (2) Botany, New Science Block Guindy Campus, Madras-25
9.	Punjab	(1) Maths (2) Geology (3) Chemistry
10.	Poona	(1) Physics
		Total = 26 CAS.

Source : Annual Report of University Grants Commission 1987-88.

Table 30
DOCTORATE DEGREES AWARDED FACULTY-WISE (1982-83 TO 1986-87)

(Number)

Faculty	1982-83	1983-84	1984-85	1985-86	1986-87*
Arts	2,422	2,678	2,754	2,886	2,987
Science	2,892	2,890	2,922	2,838	2,937
Commerce	175	177	185	263	272
Education	191	187	239	219	227
Engineering/Technology	160	192	210	194	201
Medicine	71	59	70	61	63
Agriculture	575	648	576	627	649
Veterinary Science	64	65	102	155	160
Law	20	8	25	34	35
Others	27	30	56	69	72
Total	6,597	6,934	7,139	7,346	7,603

Source : Annual Report of University Grants Commission 1987-88.

Note : * Provisional.

Table 31
ASSISTANCE GIVEN BY UGC FOR DEVELOPMENT OF SCIENCE & TECHNOLOGY EDUCATION

(Rs. Lakhs)

Year	Science	Engineering and Technology	Percentage of grant for engineering of total S&T grant
1979-80	875.32	409.53	31.9
1980-81	924.61	349.15	27.4
1981-82	1194.85	755.23	38.7
1982-83	595.27	520.32	36.2
1983-84	1964.13	574.77	16.8
1984-85	1457.96	509.11	25.9
1985-86	1982.91	551.95	21.8
1986-87	1959.52	568.27	22.5
1987-88	2025.23	1328.63	39.6

Source : Annual Report of University Grants Commission 1987-88.

Table 32
SUBJECT-WISE CENTRES OF ADVANCED STUDY, DEPARTMENT SPECIAL ASSISTANCE, DEPARTMENTAL RESEARCH
SUPPORT PROJECTS AND COSIST PROJECTS SUPPORTED BY UGC IN SCIENCES

(Number)

Subject	CAS	DSA	DRSP	COSIST
Botany	4	5	8	—
Chemistry	3	7	6	10
Physics	3	8	10	7
Geology	2	4	7	—
Mathematics	3	6	2	2
Zoology	2	9	2	1
Geography	—	3	2	—
Statistics	—	1	—	—
Organic Chemistry	—	2	—	—
Applied Chemistry	1	—	—	—
Bio-Chemistry	1	2	1	1
Inorganic & Physical Chemistry	1	1	—	—
Solid State Chemistry	1	—	—	—
Molecular Bio-Physics	1	2	—	—
Geo-Physics	—	—	1	—
Radio Physics & Electronics	1	—	—	—
Life Sciences	—	—	1	—
Bio-Sciences	—	3	1	17
Marine Biology	1	—	—	—
Microbiology	—	1	—	—
Home Science	—	—	4	—
Pharmacy	—	2	1	—
Marine Science	—	—	1	—
Earth Sciences	—	1	—	7
Genetics	—	1	—	—
Total	24	58	46	45

Source : Annual Report of University Grants Commission 1987-88.

Table 33
SUBJECT-WISE CAS, DSA, DRSP AND COSIST PROJECTS SUPPORTED BY UGC IN ENGINEERING & TECHNOLOGY
 (Number)

Subject	CAS	DSA	DRSP	COSIST
Chemical	—	2	1	2
Ceramics	—	1	—	—
Civil	—	2	—	2
Earth Quake	—	1	—	1
Electrical	—	3	—	3
Electronics	—	—	1	2
Electronics & Communication	—	—	1	1
Mechanical	—	1	1	1
Metallurgical	1	1	1	2
Mining	—	2	—	2
Production	—	1	—	1
Water Resources	—	1	—	—
Environment	—	1	—	—
Total	1	16	5	17

Source : Annual Report of University Grants Commission 1987-88.

Table 34
APPLICATIONS FOR PATENTS FROM PERSONS IN INDIA AND ABROAD IN THE YEARS 1975-76 TO 1987-88

(Number)

Persons	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
Indians	1129	1342	1097	1124	1055	1159	1093	1135	1055	1001	999	983	930
Foreigners	34	23	37	13	37	19	19	—	25	2	—	—	—
Resident in India													
Foreigners	833	1739	1736	1795	1888	1776	1877	1950	2065	2316	2527	2506	2527
Resident abroad													
Total	2996	3104	2870	2932	2980	2954	2989	3085	3145	3319	3526	3489	3457

Source : Annual Report of the Controller General of Patents, Designs and Trade Marks for, 1984-85, 1985-86 and 1987-88.

Table 35
APPLICATIONS FOR PATENTS FILED IN INDIA FROM 1980-81 TO 1987-88 BY FOREIGN COUNTRIES

(Number)

Country	Number of applications filed							
	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
U.S.A.	570	655	714	894	862	968	857	950
Federal Republic of Germany	274	229	273	248	284	277	307	305
U.K.	210	233	228	228	244	278	306	257
France	133	128	146	151	168	188	191	171
Japan	96	98	128	99	133	140	135	126
Switzerland	90	72	64	65	135	116	137	109
Italy	77	80	87	51	49	62	67	57
U.S.S.R.	57	52	37	36	58	68	64	99
Netherlands	50	59	42	42	52	56	73	46
Others	219	271	231	276	335	374	369	407
Total	1776	1877	1950	2090	2320	2527	2506	2527

Source : Annual Reports of the Controller General of Patents, Designs and Trade Marks from 1980-81 to 1987-88.

Table 36
APPLICATIONS FOR PATENTS FILED FROM 1980-81 TO 1987-88 FROM DIFFERENT STATES

(Number)

Name of the State/ Union Territory	Number of applications filed							
	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88
Delhi	333	273	270	258	241	230	253	274
Maharashtra	296	281	279	273	232	291	272	254
Tamil Nadu	112	122	164	76	109	81	90	78
West Bengal	110	120	132	147	135	110	102	85
Gujarat	72	40	52	56	70	53	35	47
Karnataka	38	43	50	65	44	53	51	41
Uttar Pradesh	37	53	29	39	48	38	39	35
Bihar	36	44	29	9	8	29	23	26
Kerala	35	37	36	49	35	35	30	20
Andhra Pradesh	34	23	40	26	21	14	23	13
Haryana	15	19	16	3	2	3	13	4
Punjab	17	10	8	12	8	9	5	—
Rajasthan	10	10	12	7	8	15	12	6
Madhya Pradesh	13	16	21	18	17	18	19	21
Others	20	20	27	17	23	20	16	26
Total	1178	1111	1163	1055	1001	999	983	930

Source : Annual Reports of the Controller General of Patents, Designs and Trade Marks from 1980-81 to 1987-88

Table 37
PATENTS FILED AND SEALED DURING 1976-77 TO 1987-88

(Number)

Year	No. of appli- cations made	No. of appli- cations brought forward from preceding year	Total No. of appli- cations to be examined	No. of appli- cations examined	No. of appli- cations deemed to have been abando- ned due to non- filling of complete specifi- cations	Total No. of complete specifi- cations as accep- ted dur- ing the year	No. of appli- cations deemed to have been abando- ned due to non- accept- ance of Complete Specifi- cations	No. of appli- cations carried forward to next year	No. of patents sealed		No. of Patents in force	
									Indian	Foreign	Indian	Foreign
1976-77	3,104	3,876	6,980	3,612	295	2,840	533	3,067	928	1,964	2,746	19,780
1977-78	2,870	3,067	5,937	2,369	378	2,507	577	3,190	657	1,857	3,065	19,795
1978-79	2,932	3,190	6,122	1,266	283	2,070	498	4,573	281	499	2,469	13,966
1979-80	2,980	4,573	7,533	1,498	304	1,210	429	5,751	516	1,657	2,786	14,474
1980-81	2,954	5,751	8,705	2,301	325	1,007	372	6,079	349	670	2,757	14,448
1981-82	2,989	6,079	9,068	2,984	274	1,191	422	5,810	421	936	3,038	14,892
1982-83	3,085	5,810	8,895	3,165	310	1,580	734	5,420	405	822	3,329	15,291
1983-84	3,145	5,420	8,565	3,043	295	1,447	774	5,522	340	980	3,523	15,726
1984-85	3,319	5,227	8,546	2,270	224	3,267	710	6,052	263	1,206	3,008	13,162
1985-86	3,526	6,052	9,578	2,490	214	1,495	824	6,874	451	1,500	2,549	10,844
1986-87	3,489	6,874	10,363	4,846	267	1,706	729	5,250	532	1,594	2,004	10,059
1987-88	3,457	5,250	8,707	3,582	158	2,966	912	4,967	588	1,516	2,150	10,115

Source : Annual Reports of the Controller General of Patents, Designs and Trade Marks 1985-86 and 1987-88.

Table 38
SCIENTISTS, ENGINEERS AND TECHNICIANS FOR SELECTED COUNTRIES

Country	SET per thousand population	SET in R&D per thousand population
Argentina	79.05 (1980)	0.37 (1982)
Australia	140.53 (1981)	2.81 (1985)
Austria	20.36 (1981)	1.71 (1981)
Brazil	36.58 (1980)	0.26 (1982)
Canada	253.42 (1981)	2.33 (1985)
Cuba	† 14.30 (1981)	1.85 (1986)
Czechoslovakia	† 35.47 (1980)	7.00 (1986)
Denmark	63.19 (1980)	@ 3.89 (1985)
Egypt	† 13.57 (1976)	0.59 (1986)
Federal Republic of Germany (FRG)	136.02 (1980)	4.14 (1983)
France	† 23.80 (1975)	@ 5.00 (1985)
German Democratic Republic (GDR)	99.32 (1986)	@ 12.09 (1986)
Guyana	2.14 (1980)	0.3 (1982)
Hungary	250.94 (1984)	3.82 (1986)
India	3.43 (1985)	0.22 (1988)
Indonesia	13.94 (1980)	† 0.18 (1986)
Italy	82.41 (1981)	1.69 (1985)
Israel	83.71 (1984)	12.88 (1984)
Japan	313.58 (1982)	5.58 (1986)
Kenya	3.42 (1982)	0.04 (1975)
Republic of Korea	52.19 (1981)	1.84 (1986)
Nepal	0.75 (1980)	0.03 (1980)
Nigeria	1.66 (1980)	0.05 (1977)
Pakistan	† 1.50 (1973)	0.23 (1986)
Panama	11.21 (1976)	0.30 (1975)
Philippines	† 36.40 (1980)	0.17 (1982)
Singapore	26.58 (1980)	1.49 (1984)
Spain	130.87 (1984)	0.60 (1985)
Sweden	263.28 (1979)	@ 6.01 (1985)
U.K.	—	2.91 (1978)
U.S.A.†	14.78 (1982)	3.28 (1986)
U.S.S.R.	123.38 (1986)	† 5.35 (1986)
Venezuela	118.27 (1982)	0.44 (1983)
Yugoslavia	180.13 (1981)	2.05 (1986)

Source : UNESCO Statistical Year Book-1988.

- Note : 1. @ Includes Auxiliary personnel
2. † Excludes Technicians
3. SET = Scientists Engineers & Technicians
4. Figures in parentheses represent the year for which data available.

Table 39
R&D EXPENDITURE PER CAPITA AND AS PERCENTAGE OF GNP FOR SELECTED COUNTRIES

Country	Year	Per Capita R&D expenditure in US \$	Per Capita GNP† in US \$	R&D Expenditure as % of GNP
Australia	1985	121.02	11,740.00 (1984)	1.3
Austria	1981	103.14	9,140.00 (1984)	1.2
Brazil	1982	13.41	1,720.00 (1984)	0.7
Canada	1985	188.13	14,120.00 (1986)	1.5
Cuba	1984	18.22	1,270.00 (1981)	0.6
Czechoslovakia	1986	151.21	5,820.00 (1981)	4.1
Denmark	1985	141.73	11,170.00 (1984)	1.3
Egypt	1982	1.28	700.00 (1983)††	0.2
F.R.G.	1983	272.50	11,130.00 (1984)	2.5
France	1985	215.81	9,760.00 (1984)	2.3
G.D.R.	1986	314.95	7,180.00 (1981)	4.5
Guyana	1982	1.03	590.00 (1984)	0.2
Hungary	1986	56.11	2,020.00 (1986)	2.6
India	1988	3.06	268.00 (1988)	1.0
Indonesia	1986	1.11	490.00 (1986)	0.3
Israel	1978	948.17	6,210.00 (1986)	2.5
Italy	1985	83.47	6,420.00 (1984)	1.3
Japan	1985	308.67	11,040.00 (1985)	2.8
Republic of Korea	1986	41.14	2,370.00 (1986)	1.8
Nigeria	1977	2.17	730.00 (1984)	0.3
Pakistan	1984	1.11	380.00 (1984)	0.3
Panama	1975	1.90	1,980.00 (1984)	0.2
Philippines	1982	1.21	660.00 (1984)	0.2
Singapore	1984	39.71	6,932.00 (1985)	0.5
Spain	1985	22.59	4,860.00 (1986)	0.5
Sweden	1985	347.74	13,160.00 (1986)	3.0
U.K.	1983	177.88	8,870.00 (1986)	2.2
U.S.A.	1986	494.30	17,480.00 (1986)	2.8
USSR	1986	153.80	4,550.00 (1981)	5.1
Venezuela	1985	10.87	2,920.00 (1986)	0.4
Yugoslavia	1986	23.43	2,300.00 (1986)	0.8

Source : 1. UNESCO Statistical Year Book 1988.
2. Europa Year Book 1987.
3. World Development Report 1988.

Note : 1. † Per Capita GNP at average 1982-84 prices.
2. †† Per Capita GNP at average 1981-83 prices.
3. Figures in parentheses represent the year for which data available.

Table 40
FINANCIAL ALLOCATIONS FOR SCIENCE & TECHNOLOGY IN THE SIXTH (1980-85) AND SEVENTH (1985-90)
PLAN PERIODS BY CENTRAL GOVERNMENT SECTOR

Sector	1980-85 Outlay		1980-85 Actuals		1985-90 Outlay	
	Rs. Crores	Percentage to total	Rs. Crores	Percentage to total	Rs. Crores	Percentage to total
1. Agriculture						
Plan	360.10	18.3	304.74	15.5	474.42	11.2
Non-Plan	193.30	13.3	227.97	14.5	406.24	12.3
Total	553.40	16.2	532.71	15.1	880.66	11.6
2. Rural Development						
Plan	0.05	0.0	1.55	0.1	10.00	0.2
Non-Plan	0.00	0.0	0.00	0.0	0.00	0.0
Total	0.05	0.0	1.55	0.1	10.00	0.1
3. Irrigation & Flood Control						
Plan	20.45	1.0	11.88	0.6	10.00	0.2
Non-Plan	14.00	1.0	17.31	1.1	40.00	1.2
Total	34.45	1.0	29.19	0.8	50.00	0.7
4. Energy						
Plan	153.18	7.8	145.00	7.4	476.57	11.2
Non-Plan	31.43	2.2	17.69	1.1	25.59	0.8
Total	184.61	5.4	162.69	4.6	502.16	6.6
5. Industry & Minerals						
Plan	247.02	12.5	206.00	10.5	437.09	10.3
Non-Plan	128.46	8.9	129.12	8.2	266.88	8.0
Total	375.48	11.0	335.12	9.5	703.97	9.3
6. Transport						
Plan	11.25	0.6	7.39	0.4	46.64	1.1
Non-Plan	36.80	2.5	42.00	2.7	101.50	3.1
Total	48.05	1.4	49.39	1.4	148.14	2.0
7. Communications, I&B						
Plan	64.65	3.3	31.18	1.6	157.25	3.7
Non-Plan	35.00	2.4	42.80	2.7	102.90	3.1
Total	99.65	2.9	73.98	2.1	260.15	3.4
8. Science & Technology						
Plan	959.29	48.6	1123.46	57.3	2303.43	54.1
Non-Plan	952.79	65.8	1069.58	68.1	2295.07	69.3
Total	1912.08	55.9	2193.04	62.0	4598.50	60.8
9. Social Services						
Plan	155.06	7.9	129.83	6.6	341.52	8.0
Non-Plan	56.00	3.9	26.00	1.6	72.54	2.2
Total	211.06	6.2	155.83	4.4	414.06	5.5
Total						
Plan	1971.05	100.0	1961.03	100.0	4256.92	100.0
Non-Plan	1447.78	100.0	1572.47	100.0	3310.72	100.0
Grand Total	3418.83	100.0	3533.50	100.0	7567.64	100.0

Source : Journal of Current Literature on Science of Science Vol 16, No. 11, Nov. 1987, published by NISTADS.

Table 41
FINANCIAL ALLOCATIONS FOR SCIENCE AND TECHNOLOGY IN THE SIXTH (1980-85) AND SEVENTH (1985-90) PLAN
PERIODS UNDER THE CENTRAL GOVERNMENT FOR EACH SECTOR/MINISTRY/DEPARTMENT/AGENCY
(Rs. Crores)

Sector/Sub Sector	Plan			Non-plan		
Ministry/Dept./Agency	1980-85 Outlay	1980-85 Actuals	1985-90 Outlay	1980-85 Outlay	1980-85 Actuals	1985-90 Outlay
(1)	(2)	(3)	(4)	(5)	(6)	(7)
I. Agriculture						
1. ICAR	340.00	290.29	425.00	190.00	224.08	400.00
2. Forests & Wild Life	12.00	10.78	35.00	0.00	0.00	0.00
3. Food	8.10	3.25	13.64	3.30	3.89	6.24
4. Civil Supplies	0.00	0.42	2.78	0.00	0.00	0.00
II. Rural Development						
5. CAPART	0.05	1.55	10.00	0.00	0.00	0.00
III. Irrigation & Flood Control						
6. Water Resources	20.45	11.88	10.00	14.00	17.31	40.00
IV. Energy						
7. Power	53.10	28.45	76.22	5.00	4.21	8.00
8. Coal	18.00	5.64	120.00	0.00	0.00	0.00
9. Petroleum & Natural Gas	32.08	46.29	150.00	26.43	13.48	17.59
10. Non Conventional Energy Sources	50.00	64.62	130.35	0.00	0.00	N.A.
V. Industry & Minerals						
11. Industrial Development	27.70	11.35	41.65	10.00	6.13	20.00
12. Public Enterprises	57.51	40.00	55.31	100.00	100.00	200.00
13. Textiles	31.50	31.50	70.95	8.40	8.40	20.00
14. Commerce	N.A.	2.50	12.77	N.A.	6.54	16.38
15. Steel	41.70	56.15	98.94	0.00	0.00	0.00
16. Mines	16.16	14.81	30.24	0.00	0.00	0.00
17. Electronics	32.34	22.57	38.00	3.00	0.49	0.00
18. Supply-NTH	8.50	7.36	14.75	3.56	3.56	5.50
19. Fertilisers						
20. (a) Chemicals	26.03	14.76	25.74	3.50	4.00	5.00
(b) Drugs & Pharmaceuticals			7.00			N.A.
(c) Petro-chemicals	5.58	5.00	41.74	N.A.	N.A.	N.A.
VI. Transport						
21. Surface Transport	9.75	6.53	18.17	0.00	0.00	0.00
22. Civil Aviation	1.50	0.86	3.47	0.80	0.89	1.50
23. Railways	0.00	0.00	25.00	36.00	41.11	100.00
VII. Communications, Information & Broadcasting						
24. (a) Telecommunications	62.15	29.66	149.50	33.00	41.01	100.00
(b) Postal Services	0.00	0.00	1.50	0.00	0.00	0.00
25. Information & Broadcasting	2.50	1.52	6.25	2.00	1.79	2.90
VIII. Science & Technology						
26. Atomic Energy - R&D	248.98	234.59	315.00	284.59	328.76	722.07
27. Environment - R&D	42.00	40.05	350.00	14.04	20.57	50.00
28. Ocean Development	40.00	87.04	100.00	0.00	7.76	49.00
29. Science & Technology (DST)	193.51	234.86	333.43	261.63	283.26	504.00
30. Biotechnology (DBT)	*	*	125.00	*	*	6.00
31. (a) CSIR	189.00	218.34	335.00	245.61	271.81	550.00
(b) DSIR	**	1.35	20.00	**	**	4.00
32. Space	245.80	307.23	700.00	146.92	157.42	375.00
33. Forensic Science & Police Wireless	0.00	0.00	25.00	N.A.	N.A.	35.00
IX. Social Services						
34. HRD-Education	45.00	39.02	180.00	5.00	0.00	0.00
(a) UGC	67.00	41.33		25.00	0.00	0.00
(b) Techn. Education	40.00	48.08	150.00	26.00	26.00	72.54
35. Health & Family Welfare - ICMR	1.06	0.36	1.51	0.00	0.00	0.00
36. Labour	2.00	1.04	0.00	0.00	0.00	0.00

37. Social Welfare						
38. Urban Development	0.00	0.00	3.00	0.00	0.00	0.00
(a) Housing	0.00	0.00	2.01	0.00	0.00	0.00
(b) Urban Development	0.00	0.00	5.00	0.00	0.00	0.00
(c) Water Supply & Sanitation						

Grand Total	1971.05	1961.03	4256.92	1447.78	1572.47	3310.72
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Source : Journal of Current Literature on Science of Science Vol. 16, No. 11, Nov. 1987 published by NISTADS, CSIR using the following sources of data.

1. The Seventh Five Year Plan, 1985-90, Planning Commission, Govt. of India.
2. The Sixth Five Year Plan, 1980-85, Planning Commission, Govt. of India.
3. Data collected by NISTADS from the concerned S&T Agencies, Ministries, Departments.
4. Report of the Steering Group on Science and Technology and Environment for the Seventh Five Year Plan, 1985-90, Planning Commission (Sept. 1984).
5. S&T Division, Planning Commission, Govt. of India.
6. Research & Development Statistics, 1984-85, Department of Science & Technology, Govt. of India.
7. Demands for Grants for various Ministries/Departments for 1986-87/1987-88 prepared by Ministry of Finance.
8. Estimates/adjustments made in NISTADS on the basis of sources 1 to 7 above.

- Note :
1. N.A. = Not available.
 2. Crore = 10,000,000
 3. In addition, according to data sources (6) during the five years 1980-85, there was an expenditure of Rs. 867 Crores on research and development and related S&T activities under Ministry of Defence (DRDO and Public Sector undertakings under Department of Defence Production). Estimates for 1985-90 are not available.
 4. * Dept. was set up in February 1986.
 5. ** Dept. was set up in January 1985.
 6. Figure under col. 3 relates to 1984-85 (RE).

7. **Abbreviations**

CSIR – Council of Scientific and Industrial Research.
DSIR – Dept. of Scientific and Industrial Research
ICAR – Indian Council of Agricultural Research
ICMR – Indian Council of Medical Research
NTH – National Test House
HRD – Ministry of Human Resources Development
UGC – University Grants Commission
Technical Education – Division of Techn. Education, Dept. of Education
DRDO – Defence Research & Development Organisation
CAPART – Council for Advancement of Peoples' Action and Rural Technology
Food – Department of Food, and so on for all other abbreviations.

8. The numbers given below against each S&T Agency/Ministry/Department refer to the sources of data used :

	Plan	Non-plan
I 1980-85 (Outlays)	2 \$	2 \$
II 1980-85 (Actuals)		
(i) Atomic Energy, Environment, Ocean Development, DST, Power, Chemicals & Fertilisers	1	4***
(ii) DSIR, Forests & Wild life	1	7
(iii) Mines	1	3
(iv) Public Enterprise @ Social Welfare	1	2, 8
(v) Others	3	3
III 1985-90 (Outlays)		
(i) Atomic Energy, Environment, Drugs & Pharmaceuticals, Mines, Housing	1	5
(ii) DST, DBT, DSIR	1, 5	5, 3, 8
(iii) CSIR, Space, Ocean Development	1, 3	3, 5
(iv) Forensic Sciences & Police Wireless, ICAR, Civil Aviation, Water Resources	1, 3	3, 8
(v) ICMR, NTH, Coal, Petroleum, Labour, Education	1, 3	3
(vi) Information & Broadcasting, Food, Civil Supplies	5, 3	3
(vii) Forests & Wild Life, Chemicals & Fertilisers, Urban Development, Non Conventional Energy Sources, Social Welfare, Power, Textiles	5	8

(viii)	Railways, Communications, Industrial Development, Public Enterprises	5.3	3.8
(ix)	Rural Development	3	3
(x)	Commerce, Steel, Surface Transport, Electronics	5	3

@ Figures relate to institutions earlier under the Department of Heavy Industry.

\$ Adjustments arising from re-organisation of Ministries/Departments, etc. have been made so as to make the figures comparable to outlays under the seventh plan. INSAT component of Meteorology (Rs. 51.64 crores, under plan) has also been added under DST. In case of Department of Public Enterprises, data relate to institutions earlier under Department of Heavy Industry.

*** The data relate to actual non-plan expenditure during 3 years 1980-83 and anticipated expenditure during 1983-85. Hence these may be slightly different from the actuals for 1980-85, data for which are not readily available.

Table 42

**EXTERNAL ASSISTANCE FOR SCIENCE & TECHNOLOGY PROGRAMMES RECEIVED BY INDIA DURING 1987 FROM
VARIOUS SOURCES (IN US DOLLARS MILLIONS, UNLESS OTHERWISE STATED)**

Source of External Assistance	Social Services														General Economic Services (Planning, Export Development and Management)	Total (U.S. Dollars Millions)	Total (Rupees Crores)	Percentage to Total (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
I. Multilateral U.N. System																		
UNDP	2.77	0.06	2.09	2.43	0.96	10.12	0.81	2.83	6.05	0.99	0.51	0.19	0.63	1.28	31.72*	41.24	28.7	
FAO	3.84	0.18	-	-	0.69	-	-	-	-	-	-	-	-	-	-	4.71	6.12	4.3
WHO	0.06	-	-	-	-	-	-	-	-	-	4.04	0.15	-	-	-	4.25	5.53	3.9
UNFPA	-	-	-	-	-	-	-	-	-	1.09	0.49	-	0.24	0.08	1.90	2.47	1.7	
UNICEF	-	-	-	-	-	-	-	-	-	0.45	-	-	-	0.20	0.65	0.85	0.6	
ILO	-	-	-	-	-	-	-	-	-	-	0.24	-	0.13	-	0.37	0.48	0.3	
Others	0.02	-	0.04	0.00	0.04	0.04	0.01	0.02	0.06	-	0.02	0.00	0.01	0.09	0.32	0.39	0.3	
Total U.N. Systems	6.69	0.24	2.13	2.43	1.69	10.13	0.82	2.85	6.11	2.53	5.30	0.34	1.01	1.65	43.92	57.08	39.8	
II. Bilateral																		
U.K.	4.21	0.45	1.11	2.25	1.06	3.09	0.59	-	0.69	7.67	1.52	0.13	-	2.08	24.85	32.30	22.5	
FRG	-	-	-	-	-	1.10	-	-	1.11	5.14	-	-	-	0.55	7.90	10.27	7.2	
Norway	-	-	-	-	5.80	0.34	-	-	1.09	-	-	-	-	0.54	7.77	10.10	7.0	
U.S.A.	0.56	-	0.65	3.68	0.65	0.29	-	-	-	-	0.32	-	-	0.72	6.87	8.93	6.2	
Switzerland	1.03	2.28	-	-	-	0.07	-	-	-	1.16	0.00	-	-	-	4.54	5.90	4.1	
Denmark	1.85	0.43	-	0.08	1.70	-	-	-	-	-	0.01	-	-	-	4.07	5.29	3.7	
Italy	0.64	-	-	0.01	1.96	0.03	-	-	0.02	0.10	-	-	-	0.13	2.89	3.76	2.6	
France	0.15	-	-	0.01	0.14	0.09	-	0.13	1.19	-	-	-	-	0.21	1.91	2.48	1.8	
Netherlands	-	-	-	0.96	-	-	0.79	-	0.31	-	0.05	-	-	-	2.11	2.75	1.9	
Australia	0.34	0.01	-	-	-	-	-	-	-	0.86	-	-	-	0.00	1.21	1.58	1.1	
Canada	0.89	-	-	-	-	-	-	-	-	-	-	-	-	-	0.89	1.16	0.8	
Sweden	-	-	0.31	-	-	-	-	-	-	-	-	-	-	-	0.31	0.40	0.3	
New Zealand	-	-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.04	0.05	0.0	
Total Bilateral	9.67	3.17	2.07	6.98	11.31	5.01	1.38	0.13	4.41	14.93	1.90	0.13	-	4.27	65.36	84.97	59.2	

III. Non-Governmental Organizations													
Ford Foundation	-	-	-	-	-	-	-	-	-	-	-	-	-
IDRC	0.20	-	0.11	-	-	-	-	-	-	-	0.03	-	-
Total NGOs	0.20	-	0.11	-	-	-	-	-	-	-	0.03	-	-
Grand Total I + II + III													
(Million U.S. Dollars)	16.56	3.41	4.31	9.41	13.00	15.14	2.20	2.98	10.52	17.84	7.37	0.50	1.01
(Rupees Crores)	21.53	4.43	5.61	12.23	16.90	19.68	2.86	3.88	13.68	23.19	9.58	0.65	1.31
% to Total	15.0	3.1	3.9	8.5	11.8	13.7	2.0	2.7	9.5	16.2	6.7	0.5	0.9
Source	National Institute of Science Technology and Development Studies.												
Note	* Overall total as shown in ORDP document for all UNDP funded projects is US \$ 29.980 million. UNDP funding is almost entirely for projects of S&T nature.												

Table 43
STATEWISE S&T PERSONNEL DENSITY FOR THE YEAR 1981

State	* Area (in sq.km.)	Number of S&T personnel†			Number of S&T personnel per 10 sq.km.		
		Male	Female	Total	Male	Female	Total
Andhra Pradesh	275100	76685	10740	87425	2.79	0.39	3.18
Assam	78400	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.
Bihar	173900	104775	5140	109915	6.03	0.30	6.33
Gujarat	196000	67670	9225	76895	3.45	0.47	3.92
Haryana	44200	27305	3420	30725	6.18	0.77	6.95
Himachal Pradesh	55700	10797	1231	12028	1.94	0.22	2.16
Jammu & Kashmir	222200	8798	1241	10039	0.40	0.06	0.46
Karnataka	191800	126510	24880	151390	6.59	1.30	7.89
Kerala	38900	105100	44335	149435	27.02	11.40	38.42
Madhya Pradesh	443400	89505	15010	104515	2.02	0.34	2.36
Maharashtra	307700	199692	32703	232395	6.49	1.06	7.55
Manipur	22300	1339	254	1593	0.60	0.11	0.71
Meghalaya	22400	1527	282	1809	0.68	0.13	0.81
Nagaland	16600	1187	156	1343	0.71	0.09	0.80
Orissa	155700	39440	3630	43070	2.53	0.23	2.76
Punjab	50400	27655	4755	32410	5.49	0.94	6.43
Rajasthan	342200	38285	4770	43055	1.12	0.14	1.26
Sikkim	7100	931	122	1053	1.31	0.17	1.48
Tamil Nadu	130100	128635	31690	160325	9.89	2.44	12.33
Tripura	10500	2645	298	2943	2.52	0.28	2.80
Uttar Pradesh	294400	161580	19245	180825	5.49	0.65	6.14
West Bengal	88800	121377	15587	136964	13.67	1.75	15.42
Andaman and Nicobar	8300	910	168	1078	1.10	0.20	1.30
Arunachal Pradesh	83700	1632	139	1771	0.19	0.02	0.21
Chandigarh	100	5976	1576	7552	597.6	157.60	755.2
Dadra & Nagar Haveli	500	216	21	237	4.32	0.42	4.74
Delhi	1500	43269	10684	53953	288.46	71.23	359.69
Goa, Daman & Diu	3800	5357	1114	6471	14.10	2.93	17.03
Lakshadweep	30	167	28	195	55.67	9.33	65.00
Mizoram	21100	699	100	799	0.33	0.05	0.38
Pondicherry	500	1885	530	2415	37.7	10.60	48.3
Total	3287300	1401549	243074	1644623	4.26	0.74	5.00

Source : Data compiled by DST.

Note : † Degree Holders and Technical Personnel Survey Census 1981
(Statistical Tables on Scientific & Technical Manpower—Volume V-VIII).

* India — 1986.

Table 44
SELECTED STATISTICAL INDICATORS FOR INDIA

Indicator	Year	Unit	Numbers	Source		
POPULATION AND HEALTH						
(a) Population	1950-51	Million	361.2	Economic Survey		
	1988-89	Million	811.8	1989-90		
(b) Birth Rate Per Thousand Population	1950-51	Number	39.9	Economic Survey		
	1988-89	Number	31.3	1989-90		
(c) Death Rate Per Thousand Population	1950-51	Number	27.4	Economic Survey		
	1988-89	Number	10.9	1989-90		
(d) Female Population Per Thousand Male	1951	Number	946	Selected Socio		
	1981	Number	933	Economic Indicators for India — 1989		
(e) Registered Medical Practitioners (R.M.P.)	1950-51	Thousand	61.8	Economic Survey		
	1986-87	Thousand	331.6	1989-90		
(f) Registered Medical Practitioners (R.M.P.) Per Ten Thousand Population	1950-51	Number	1.7	Economic Survey		
	1986-87	Number	4.3	1989-90		
(g) Beds All Types Per Ten Thousand Population	1950-51	Number	3.2	Economic Survey		
	1987-88	Number	9.2	1989-90		
(h) Expectancy of Life at Birth	(1) Male	1950-51	Years	32.45	Economic Survey	
		1987-88	Years	58.1	1989-90	
	(2) Female	1950-51	Years	31.66	Economic Survey	
		1987-88	Years	59.1	1989-90	
	(i) Percentage of Population Below the Poverty Line	(1) Rural	1961-62	Percentage	56.2	Selected Socio
			1983-84	Percentage	40.4	Economic Indicators
(2) Urban		1961-62	Percentage	45.9	for India	
		1983-84	Percentage	28.1	1987 and 1989	
(3) Combined		1961-62	Percentage	54.3		
		1983-84	Percentage	37.4		
AGRICULTURE PRODUCTION						
(a) Foodgrains		1950-51	Million Tonnes	50.8	Economic Survey	
	1986-87	Million Tonnes	143.4	1989-90		
	1987-88	Million Tonnes	140.4			
	1988-89	Million Tonnes	170.25			
	1989-90	Million Tonnes	175.00 T			
(b) Oilseeds	1950-51	Million Tonnes	5.2	Economic Survey		
	1986-87	Million Tonnes	11.27	1989-90		
	1987-88	Million Tonnes	12.65			
	1988-89	Million Tonnes	17.84			
	1989-90	Million Tonnes	16.50 T			
(c) Pulses	1950-51	Million Tonnes	8.40	Economic Survey		
	1986-87	Million Tonnes	11.71	1989-90		
	1987-88	Million Tonnes	10.96			
	1988-89	Million Tonnes	13.70			
	1989-90	Million Tonnes	14.75 T			
PER CAPITA AVAILABILITY						
(a) Cereals	1951	Gms/day	334.2	Economic Survey		
	1988	Gms/day	456.2+	1989-90		
(b) Pulses	1951	Gms/day	60.7	Economic Survey		
	1988	Gms/day	40.4+	1989-90		

Indicator	Year	Unit	Numbers	Source
BASIC ECONOMIC DATA				
(a) GNP at Factor Cost	1950-51	Rs. Crores (at current prices)	8,938	Economic Survey 1989-90
	1988-89	Rs. Crores (at current prices)	3,46,277	Economic Survey 1989-90
(b) Per Capita Net National Product	1950-51	Rs. (at current prices)	237.5	Economic Survey 1989-90
	1988-89	Rs. (at current prices)	3,835.3	Economic Survey 1989-90
(c) Index of Industrial Production	1950-51	(Base : 1980-81)	18.3	Economic Survey 1989-90
	1988-89	(Base : 1980-81)	181.1	Economic Survey 1989-90
(d) Wholesale Price Index	1950-51	(Base : 1970-71)	47.5	Economic Survey 1989-90
	1988-89	(Base : 1970-71)	435.3	Economic Survey 1989-90
(e) Consumer Price Index	1950-51	(Base : 1960)	83	Economic Survey 1989-90
	1988-89	(Base : 1960)	803	Economic Survey 1989-90
(f) Number of Villages Electrified	1951	Number	3,061	India
	1987	Number	4,02,647	1984 & 1987
FOREIGN TRADE				
(a) Exports	1950-51	Rs. Crores	606	Economic Survey 1989-90
	1988-89	Rs. Crores	20,295+	Economic Survey 1989-90
(b) Imports	1950-51	Rs. Crores	608	Economic Survey 1989-90
	1988-89	Rs. Crores	28,194++	Economic Survey 1989-90
EDUCATION				
(a) Literacy Rate	1950-51	Percentage	16.7	Economic Survey 1989-90
	1980-81	Percentage	36.2	Economic Survey 1989-90
(b) Number of University/ Deemed University	1950-51	Number	27	India 1987
	1987-88	Number	164	UGC Annual Report 1987-88
(c) Number of Colleges	1950-51	Number	542	India, 1987
	1985-86	Number	9,102	India, 1987
(d) Number of High/ Higher Secondary Schools	1950-51	Number	7,288	India, 1987
	1985-86	Number	61,314	India, 1987
(e) Number of Primary/ Junior Basic Schools	1950-51	Number	2,09,671	India, 1987
	1985-86	Number	5,28,029	India, 1987
(f) Number of Middle/ Senior Basic Schools	1950-51	Number	13,590	India, 1987
	1985-86	Number	1,34,074	India, 1987
RESEARCH & DEVELOPMENT				
(a) R&D Expenditure	1950-51	Rs. Crores	4.7	R&D Stat.
	1988-89	Rs. Crores	3471.81	1986-87 & 1988-89
(b) R&D Expenditure as Percentage of GNP	1950-51	Percentage	0.05	R&D Stat.
	1988-89	Percentage	1.00	1986-87 & 1988-89

Source : Data compiled by DST.

Note : 1. † Provisional
2. ++ Partially revised
3. T = Targeted

APPENDICES

I. S&T INSTITUTIONS UNDER CENTRAL GOVERNMENT

MAJOR SCIENTIFIC AGENCIES

DEPARTMENT OF ATOMIC ENERGY

Atomic Minerals Division, AMD Complex 1-10-153, Begumpeth, Hyderabad-500 016 Andhra Pradesh.	Institute of Mathematical Sciences, Madras-600 020, Tamil Nadu.	Tata Institute of Fundamental Research, Dr. Homi Bhabha Road, Colaba, Bombay-400 012, Maharashtra.
Bhabha Atomic Research Centre, Trombay, Bombay-400 085, Maharashtra.	Mehta Research Institute, Allahabad, Uttar Pradesh.	Tata Memorial Centre, Dr. Earnest Borges Marg, Parel, Bombay-400 012, Maharashtra.
Electronics Corporation of India Limited, ECIL Post Office, Hyderabad-500 762, Andhra Pradesh.	Reactor Research Centre, Kalpakkam, Chengleput-693 010 Tamil Nadu.	Uranium Corporation of India Ltd., P.O. Jaduguda Mines, Dist. Singhbhum-832 102 Bihar.
Indian Rare Earths Limited, Pill Court, 111, M.K. Road, Bombay-400 020, Maharashtra.	Saha Institute of Nuclear Physics. 92, Acharya Prafulla Chandra Road, Calcutta-700 009, West Bengal.	Variable Energy Cyclotron, 1 / AF Vidhan Nagar, Calcutta-700 064, West Bengal.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Central Building Research Institute, Roorkee-247 667 Uttar Pradesh.	Central Fuel Research Institute, P.O. CFRI, Dhanbad-828 108, Bihar.	Central Mining Research Station, Barwa Road, Dhanbad-826 001, Bihar.
Central Drug Research Institute, Chattar Manzil Palace, Post Box No. 173, Lucknow-226 001, Uttar Pradesh.	Central Glass and Ceramic Research Institute, P.O. Jadavpur University, Calcutta-700 032, West Bengal.	Central Road Research Institute, P.O. CRRI, New Delhi-110 020.
Central Electrochemical Research Institute, CECRI Nagar, Karaikudi-623 006, Tamil Nadu.	Central Institute of Medicinal & Aromatic Plants, P.O. Faridnagar, Lucknow-226 010, Uttar Pradesh.	Central Salt and Marine Chemicals Research Institute, Bhavnagar-364 002, Gujarat.
Central Electronics Engineering Research Institute, Pilani-333 031, Rajasthan.	Central Leather Research Institute, Adyar, Madras-600 020, Tamil Nadu.	Central Scientific Instruments Organisation, Sector 30, Chandigarh-160 020.
Central Food Technological Research Institute, V.V. Mohalla, Mysore-570 013, Karnataka.	Central Mechanical Engineering Research Institute, Mahatma Gandhi Avenue, Durgapur-713 209, West Bengal.	Centre for Cellular and Molecular Biology, Hyderabad-500 009, Andhra Pradesh.
		CSIR Centre for Biochemicals, VP Chest Institute Building, University Campus, Delhi-110 007.

CSIR Complex Cochin, Industrial Estate, P.O. Pappanamcode, Trivandrum-695 018, Kerala.	National Botanical Research Institute, Rana Pratap Marg, Lucknow-226 001, Uttar Pradesh.	Publications and Information Directorate, Hillside Road, New Delhi-110 012.
CSIR Madras Complex, Adyar, Madras-600 020, Tamil Nadu.	National Chemical Laboratory, Pune-411 008, Maharashtra.	Regional Research Laboratory, Bhopal, Madhya Pradesh.
Electrical Research and Development Association, P.B. No. 760, Makarpura Industrial Estate, P.O. Vadodara-390 010, Gujarat.	National Environmental Engineering Research Institute, Nehru Marg, Nagpur-440 020, Maharashtra.	Regional Research Laboratory, Bhubaneswar-751 004, Orissa
Indian Institute of Chemical Biology, 4, Raja S.C. Mullick Road, Calcutta-700 032, West Bengal.	National Geophysical Research Institute, Uppal Road, Hyderabad-500 007, Andhra Pradesh.	Regional Research Laboratory, Jammu Tawi-180 001, Jammu & Kashmir.
Indian Institute of Petroleum, P.O. IIP, Dehradun-248 005, Uttar Pradesh.	National Institute of Oceanography, Dona Paula, Goa-403 004.	Regional Research Laboratory Industrial Estate P.O., Pappanamcode, Trivandrum-695 018, Kerala.
Indian National Scientific Documentation Centre, Shaheed Jeet Singh Marg, New Delhi-110 067.	National Institute of Science, Technology and Development Studies, Hillside Road, New Delhi-110 012.	Structural Engineering Research Centre, Adyar, CSIR Complex, Madras-600 020, Tamil Nadu.
Industrial Toxicology Research Centre, Mahatma Gandhi Marg, Lucknow-226 001, Uttar Pradesh.	National Metallurgical Laboratory, Jamshedpur-831 007, Bihar.	Structural Engineering Research Centre, Roorkee-247 667, Uttar Pradesh.
National Aeronautical Laboratory, Bangalore-560 017, Karnataka.	National Physical Laboratory, Hillside Road, New Delhi-110 012.	Tea Research Association, Jorhat-785 008, Assam.

DEFENCE RESEARCH AND DEVELOPMENT ORGANISATION

Aerial Delivery Research & Development Establishment, P.O. No.51, Station Road, Agra Cantt., Uttar Pradesh.	Aeronautical Development Establishment, C.V. Raman Nagar, Bangalore-560 075, Karnataka.	Agricultural Research Unit, Almora, Uttar Pradesh.
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Armament Research &
Development Establishment,
Pashan,
Pune-411 021,
Maharashtra.

Centre for Aeronautical Systems
Studies & Analysis,
C.V. Raman Nagar,
Bangalore-560 093,
Karnataka.

Combat Vehicles Research &
Development Establishment,
Avadi,
Madras-600 054,
Tamil Nadu.

Defence Bio-Engineering &
Electro-Medical Laboratory,
38/3 Luxmi Complex,
Lal Bagh Road,
Bangalore-560 027,
Karnataka.

Defence Electronics Applications
Laboratory,
Sunder Wala Camp,
P.O. Raipur,
Dehra Dun-248 008,
Uttar Pradesh.

Defence Electronics Research
Laboratory,
Chandrayanagutta Lines,
Hyderabad-500 005,
Andhra Pradesh.

Defence Food Research Laboratory,
Jyothi Nagar,
Mysore-570 010,
Karnataka.

Defence Institute of Psychological
& Allied Sciences,
Delhi Cantt-110 010.

Defence Institute of
Psychological Research,
West Block No. 8,
R.K. Puram, New Delhi-110 066.

Defence Institute of Work Study,
Landour Cantt.
Mussorie-248 179,
Uttar Pradesh.

Defence Institute of Fire Research,
Probyn Road,
Delhi-110 007.

Defence Laboratory.
Post Box No. 136,
Jodhpur-342 001,
Rajasthan.

Defence Materials & Stores
Research & Development
Establishment,
P.B. No. 320,
Kanpur-208 004,
Uttar Pradesh.

Defence Metallurgical Research
Laboratory,
P.O. DMRL,
Hyderabad-500 258,
Andhra Pradesh.

Defence Research & Development
Laboratory,
Kanchan Bagh,
Hyderabad-500 258,
Andhra Pradesh.

Defence Research Laboratory,
Post Box No. 2,
Tezpur-784 001,
Assam.

Defence Research & Development
Establishment,
Tansen Road,
Gwalior-474 002,
Madhya Pradesh.

Defence Research &
Development Unit,
S-2/2, Commissariate Road,
Hastings,
Calcutta-700 022
West Bengal.

Defence Scientific Information &
Documentation Centre,
Metcalf House,
Delhi-110 054.

Defence Science Centre,
Metcalf House,
Delhi-110 054.

Defence Terrain Research Laboratory,
Metcalf House,
Delhi-110 054.

Electronic & Radar Development
Establishment,
D.R.D.O. Complex,
C.V. Raman Nagar,
Bangalore-560 001,
Karnataka.

Explosive Research & Development
Laboratory,
Pashan,
Pune-411 021,
Maharashtra.

Field Research Laboratory,
C/o. 56 A.P.O.

Gas Turbine Research
Establishment,
Suranjan Das Road,
P.B. No. 1777,
Bangalore-560 075,
Karnataka.

Institute of Armament Technology,
Singabad Road,
Girinagar, Pune-411 025,
Maharashtra.

Institute of Nuclear Medicine
& Allied Sciences,
Probyn Road,
Delhi-110 007.

Institute of Systems Studies &
Analysis (ISSA),
Metcalf House,
Delhi-110 054.

Instrument Research &
Development Establishment,
Raipur,
Dehra Dun-248 008,
Uttar Pradesh.

Naval Chemical & Metallurgical
Laboratory,
Naval Dockyard,
Bombay-400 001,
Maharashtra.

Naval Physical & Oceanographic Laboratory,
Naval Base,
Cochin-682 004,
Kerala.

Naval Science & Technological Laboratory,
Vigyan Nagar,
Vishakhapatnam,
Andhra Pradesh.

Proof & Experimental Establishment,
Balasore-756 001,
Orissa.

Research & Development Establishment (Engineers),
Pioneer Lines, Dighi,
Pune-411 015, Maharashtra.

Scientific Analysis Group (SAG),
Metcalf House,
Delhi-110 054.

Snow & Avalanche Study, Establishment, C/o 56 A.P.O.

Solid State Physics Laboratory,
Lucknow Road,
Timarpur,
Delhi-110 007.

Terminal Ballistics Research Laboratory,
Sector 30,
Chandigarh-160 020.

Vehicles Research & Development Establishment,
Ahmednagar-414 001,
Maharashtra.

INDIAN COUNCIL OF MEDICAL RESEARCH

Central Jalma Institute for Leprosy, Tajganj,
Agra, Uttar Pradesh.

Cytology Research Centre,
Maulana Azad Medical College,
New Delhi-110 002.

Enterovirus Research Centre,
Haffkine Institute,
Parel,
Bombay-400 012,
Maharashtra.

Field Research Centre,
Mental House,
Agra-282 002,
Uttar Pradesh.

Food Drug & Toxicology Research Centre,
National Institute of Nutrition,
Jamia-Osmania,
Hyderabad-500 007,
Andhra Pradesh.

ICMR Haematology Unit,
School of Tropical Medicine,
Calcutta-700 073,
West Bengal.

Institute of Immunohaematology,
Seth G.S. Medical College,
Parel, Bombay-400 017,
Maharashtra.

Institute of Pathology,
Safdarjang Hospital,
New Delhi-110 029.

Institute for Research in Medical Statistics,
Sathyamurthi Road,
Chetput, Madras-600 031,
Tamil Nadu.

Institute for Research in Medical Statistics,
ICMR Headquarters Office,
Ansari Nagar,
New Delhi-110 029.

Institute for Research in Reproduction,
Jahangir Merwanji Street,
Parel, Bombay-400 012,
Maharashtra.

Laboratory Animal Information Service Centre,
National Institute of Nutrition,
Jamia-Osmania,
Hyderabad-500 007,
Andhra Pradesh.

Malaria Research Centre,
22, Sham Nath Marg,
Delhi-110 054.

National Institute for Cholera & Enteric Diseases,
P-33 Scheme XM Beliaghata,
Calcutta-700 010,
West Bengal.

National Institute of Occupational Health,
Meghani Nagar,
Ahmedabad-380 016,
Gujarat.

National Institute of Nutrition,
Jamia-Osmania,
Hyderabad-500 007,
Andhra Pradesh.

National Institute of Virology,
20-A, Dr. Ambedkar Road,
Post Box No. 11,
Pune-411 011, Maharashtra.

Rajendra Memorial Research Institute of Medical Sciences,
Agam Kuan,
Patna-800 001, Bihar.

Regional Medical Research Centre,
East Chowkindinghee,
Dibrugarh, Assam.

Regional Medical Research Centre,
107 (P) Acharya Vihar,
Bhubaneswar-751 013, Orissa.

Regional Medical Research Centre, Farzand Ali Market, Aberdeen Bazar, Port Blair-744 104, Andaman Nicobar Islands.	Regional Occupational Health Centre (Southern), Ground Floor, PPC Block, Bangalore Medical College Campus, Bangalore-560 002, Karnataka.	Vector Control Research Centre, Opp. EST Hospital, Indra Nagar, Pondicherry-605 006.
Regional Occupational Health Centre, (Eastern), C/o All India Institute of Hygiene & Public Health, 110, Chittaranjan Avenue, Calcutta-700 012, West Bengal.	Tuberculosis Research Centre, Spur Tank Road, Chetput, Madras-600 031, Tamil Nadu.	WHO Collaborating Centre for Research and Training in Mental Health, Mental Hospital, Agra-282 002, Uttar Pradesh.

INDIAN COUNCIL OF AGRICULTURAL RESEARCH

All India Coordinated Rice Improvement Project, Rajendra Nagar, Hyderabad-500 030. Andhra Pradesh.	Central Institute for Cotton Research, 95, Pushpa Kunj Canal Road, New Ramdaspath, Nagpur-440 010, Maharashtra.	Central Sheep & Wool Research Institute, P.O. Avikanagar-304 501, Via-Jaipur, Rajasthan.
Central Agricultural Research Institute for Andaman & Nicobar Group of Islands, Port Blair-744 101, Andaman Nicobar Islands.	Central Institute of Fisheries Education, Post Box No. 7392, Kakori Camp, Jaiprakash Road, Bombay-400 061, Maharashtra.	Central Soil Salinity Research Institute, Karnal-132 001, Haryana.
Central Avian Research Institute, Izatnagar-243 122, Uttar Pradesh.	Central Institute of Fisheries Technology, P.O. Matsyapuri, Cochin-682 029, Kerala.	Central Soil & Water Conservation Research & Training Institute, 218, Kaulagarh Road, Dehradun-248 195, Uttar Pradesh.
Central Arid Zone Research Institute, Jodhpur-342 001, Rajasthan.	Central Marine Fisheries Research Institute, P.O. No. 1912, Cochin-682 018, Kerala.	Central Tobacco Research Institute, Rajahmundry-533 104, Andhra Pradesh.
Central Research Institute for Dryland Agriculture, Sanbath Nagar Saidabad, Hyderabad-500 030, Andhra Pradesh.	Central Plantation Crops Research Institute, Post Kudlu, Kasargod-675 017, Kerala.	Central Tuber Crops Research Institute, Sreekariyam, Trivandrum-695 017, Kerala.
Central Inland Fisheries Research Institute, Barrackpore-743 101, West Bengal.	Central Potato Research Institute, Shimla-171 001, Himachal Pradesh.	Cotton Technological Research Laboratory, Adenwala Road, Matunga, Bombay-400 019, Maharashtra.
Central Institute of Agricultural Engineering, Shri Guru Teg Bahadur Complex, Addl. "A" Block, New Market, T.T. Nagar, Bhopal-462 003, Madhya Pradesh.	Central Rice Research Institute, Cuttack-753 006, Orissa.	Directorate of Oil Seeds Research, "D" Block, College of Agriculture, Rajendranagar, Hyderabad-500 030, Andhra Pradesh.

Indian Agricultural Research Institute,
Pusa Road,
New Delhi-110 012.

Indian Agricultural Statistics Research Institute,
Library Avenue,
New Delhi-110 012.

ICAR, Research Complex for North Eastern Hills Region,
Cedar Lodge,
Jawai Road, Shillong-793 001,
Meghalaya.

Indian Grassland & Fodder Research Institute,
Gwalior-Jhansi Road,
Jhansi-234 001, Uttar Pradesh.

Indian Institute of Horticultural Research,
255 Upper Palace,
Orchards, Bangalore-560 080,
Karnataka.

Indian Institute of Sugarcane Research,
P.O. Dilkusha,
Lucknow-226 002,
Uttar Pradesh.

Indian Lac Research Institute,
P.O. Namkum,
Ranchi-834 010,
Bihar.

Indian Veterinary Research Institute,
Izatnagar-243 122,
Uttar Pradesh.

Jute Agricultural Research Institute,
24, Paraganas, P.O.
Barrackpore-743 101,
West Bengal.

Jute Technological Research Laboratory,
12, Regent Park,
Calcutta-700 040,
West Bengal.

National Academy for Agricultural Research Management,
Rajendranagar,
Hyderabad-500 030,
Andhra Pradesh.

National Bureau of Plant Genetic Resources,
FCI Building,
CTO Complex, Pusa,
New Delhi-110 012.

Central Institute of Horticulture for Northern Plains,
B-217, Indra Nagar,
P.O. Ram Sagar Mishra Nagar,
Lucknow-226 016.

National Bureau of Soil Survey and Land Use Planning,
Seminary Hills,
Nagpur-440 006,
Maharashtra.

National Dairy Research Institute,
Karnal-132 001,
Haryana.

National Goat Research Institute,
Makhdoom P.O. Farah,
District Mathura-281 122,
Uttar Pradesh.

National Research Centre for Groundnut,
Maharishi Dayanand Farm,
Gujarat Agricultural Univ. Campus,
Junagarh, Gujarat.

Regional Research Station,
IARI, Indore,
Madhya Pradesh.

Regional Research Station, IARI,
Katraia (Kullu Valley),
Himachal Pradesh.

Sugarcane Breeding Institute,
Lawley Road,
Coimbatore-641 007,
Tamil Nadu.

Vivekanand Parvatiya Krishi Anusandhan Shala,
Almora-263 601,
Uttar Pradesh.

Central Institute of Fresh Water Aquaculture,
Kausalyaganj,
Bhubaneswar-751 002,
Orissa.

DEPARTMENT OF ELECTRONICS

Centre for Development of Telematics (C-DOT),
9th Floor, Akbar Hotel,
Chanakya Puri,
New Delhi-110 021.

Electronics Trade & Technology Development Corporation,
15/48, Malcha Marg, Chanakya Puri,
New Delhi-110 021.

Computer Maintenance Corporation,
8 E Hansalaya,
15 Barakhamba Road,
New Delhi-110 001.

National Centre for Software Development & Computing Techniques,
Tata Institute of Fundamental Research,
Homi Bhabha Road,
Colaba, Bombay-400 003,
Maharashtra.

DEPARTMENT OF ENVIRONMENT

Bombay Natural History Society, Hornbill House, Shaheed Bhagat Singh Road, Bombay-400 023, Maharashtra.	Forest Research Institute & Colleges, P.O. New Forest, Dehradun, Uttar Pradesh.	Regional Forest Research Centre, P.O. RFRC, Jabalpur-482 021, Madhya Pradesh.
Botanical Survey of India, Post Office : Botanic Gardens, Shibpur, Howrah-700 003, West Bengal.	National Forest Computer Centre, FRIN College, Dehradun, Uttar Pradesh.	Sandal Research Centre, 18th Cross Malleswaram, Bangalore-560 003, Karnataka.
Forest Productivity Scheme, FRI College Dehradun, Uttar Pradesh.	National Museum of Natural History, Barakhamba Road, New Delhi-110 001,	
Forest Research Laboratory, Government of India, P.O. Malleswaram, Bangalore-560 003, Karnataka.	Padamje Naidu Himalayan Zoological Park, Jawahar Park, Jawahar Parvat, Darjeeling, West Bengal.	Zoological Survey of India, 34, Chittaranjan Avenue, Calcutta-700 012, West Bengal.

DEPARTMENT OF SCIENCE AND TECHNOLOGY

Birbal Sahni Instt. of Paleobotany, 53, University Road, Lucknow-226 007, Uttar Pradesh.	Indian Institute of Geomagnetism, Colaba, Bombay-400 005, Maharashtra.	National Atlas & Thematic Mapping Organisation, 50-A, Garihat Road, Calcutta-700 019, West Bengal.
Bose Institute, 93/1, Acharya Prafulla Chandra Road, Calcutta-700 009, West Bengal.	Indian Institute of Tropical Meteorology, Ramdurg House, University Road, Pune-411 005, Maharashtra.	Raman Research Institute, Hebbal P.O. Bangalore-560 006, Karnataka.
Indian Academy of Science, Bangalore, Karnataka.	Indian National Science Academy, Bahadur Shah Zafar Marg, New Delhi-110 002.	Research and Development Directorate, Survey of India, Uppal, Hyderabad, Andhra Pradesh.
Indian Association for the Cultivation of Science, Jadavpur, Calcutta-700 032, West Bengal.	Indian Science Congress Association, Dr. Biresguha Street, Calcutta-700 017, West Bengal.	S.N. Bose National Centre for Basic Sciences, DB-17, Sector 1, Salt Lake, Calcutta-700 064, West Bengal.
Indian Meteorological Department, Mausam Bhawan, Lodhi Road, New Delhi-110 003.	Institute of Plasma Research, Ahmedabad-380 053, Gujarat.	Sree Chitra Tirunal Medical Institute for Science and Technology, Trivandrum, Kerala.
Indian Institute of Astrophysics, Bangalore-560 034, Karnataka.	Maharashtra Association for the Cultivation of Science, Law College Road, Pune-411 004, Maharashtra.	Wadia Instt. of Himalayan Geology, 13, Municipal Road, Dehradun-248 001, Uttar Pradesh.

DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH

Central Electronics Ltd.,
Industrial Area-4,
Sahibabad-201 005,
Uttar Pradesh.

National Research Development
Corporation,
20-22, Jamroodpur Community
Centre,
Kailash Colony Extension,
New Delhi-110 048.

DEPARTMENT OF BIOTECHNOLOGY

National Institute of Immunology,
Jawaharlal Nehru University Campus,
New Delhi-110 067.

DEPARTMENT OF SPACE

INSAT-I Space Segment Project
Office, Chandra Kiran Building,
Kasturba Road,
Bangalore-560 001,
Karnataka.

ISRO Satellite Centre,
Airport Road,
Vimanapura,
Bangalore-560 017,
Karnataka.

Space Applications Centre,
Jodhpur Tekkra,
Ahmedabad-380 053,
Gujarat.

Indian Space Research Organisation,
Headquarters, Cauvery Bhavan,
Kampegowda Road,
Bangalore-560 009,
Karnataka.

National Remote Sensing Agency,
No. 4, Sardar Patel Road,
Secunderabad-500 003,
Andhra Pradesh.

SHAR Centre,
Sriharikota, Sullurupeta,
Nellore Dist.-524 124,
Andhra Pradesh.

Physical Research Laboratory,
Navrangapura,
Ahmedabad-380 009,
Gujarat.

Vikram Sarabhai Space Centre,
Trivandrum-695 002,
Kerala.

MINISTRIES/DEPARTMENTS

MINISTRY OF AGRICULTURE

a) DEPARTMENT OF AGRICULTURE & COOPERATION

Central Cattle Breeding Farm,
Chiplima, P.O. Kolamati,
Distt. Sambalpur, Orissa.

Central Cattle Breeding Farm,
Seliligoda, Distt. Koraput,
Orissa.

Central Cattle Breeding Farm,
Almadhi (Via) Red Hills,
Madras-600 054,
Tamil Nadu.

Central Cattle Breeding Farm,
Dhamrod P.O.-394 125,
Gujarat.

Central Poultry Breeding Farm,
Bombay-400 065,
Maharashtra.

Central Poultry Breeding Farm,
Hessarghatta, Bangalore-560 006,
Karnataka.

Central Poultry Breeding Farm,
Bhubaneswar,
Orissa.

High Level Inservice Training,
(Poultry) Institute, Hessarghatta,
Bangalore-560 006, Karnataka.

Regional Station of Forage
Production & Demonstration,
Suratgarh-335 803,
Gujarat.

Regional Station on Forage
Production & Demonstration,
H. No. 1-9699/A, Vidyasagar,
Hyderabad-500 044,
Andhra Pradesh.

Regional Station on Forage
Production & Demonstration,
Rajbagh, Srinagar-190 001,
Jammu & Kashmir.

Regional Station on Forage
Production & Demonstration,
Almadhi (Via) Red Hills,
Madras-600 054, Tamil Nadu.

Regional Station on Forage
Production & Demonstration,
Hisar, Haryana.

Regional Station on Forage
Production & Demonstration,
Sector No. 30,
Gandhi Nagar-382 038,
Gujarat.

Regional Station on Forage
Production & Demonstration,
P/7, 107, Layani, P.O.
Kalyani, Distt. Nadia,
West Bengal.

a) DEPARTMENT OF COMMERCE

Central Coffee Research Instt.,
Chickmaglore, Mysore,
Karnataka.

Central Muga & Eri Research Station,
Titabar-785 632, Assam.

Central Sericultural Research &
Training Institute,
78, Devi Niwas Nizarbad,
Mysore-570 010, Karnataka.

Central Sericultural Research
Station,
Berhampur-752 010, Orissa.

Central Tasar Research Station,
Hehal, Ranchi-834 005,
Bihar.

Rubber Research Instt. of India,
Rubber Board, Kottayam-9,
Kerala.

a) DEPARTMENT OF TELECOMMUNICATIONS

Hindustan Cables Limited,
Hyderabad-500 051,
Andhra Pradesh.

b) DEPARTMENT OF FERTILIZERS

The Fertilizers & Chemicals
Travancore Ltd. (FACT),
Udyogmandal-682 501,
Kerala.

Projects and Development India Ltd.,
CIFT Building,
Sindri-828 122,
Bihar.

MINISTRY OF COMMERCE

Regional Sericultural Research
Station,
Central Silk Board,
Assam-785 632.

UPASI Tea Research Station,
P.O. Cinchona-642 106,
Tamil Nadu.

b) DEPARTMENT OF TEXTILES

Ahmedabad Textile Industry's
Research Association,
Polytechnic P.O.,
Ahmedabad-380 015, Gujarat.

The Bombay Textile Research
Association,
L.B. Shastri Marg,
Ghatkopar West,
Bombay-400 086,
Maharashtra.

Indian Jute Industry's
Research Association,
17, Taratola Road,
Calcutta-700 053,
West Bengal.

MINISTRY OF COMMUNICATIONS

Hindustan Cables Ltd.,
9, Elgin Road,
Calcutta-700 020.

Hindustan Teleprinters Ltd.,
GST Road, Guindy,
Madras-600 032,
Tamil Nadu.

Madras Fertilizers Ltd.,
Manali P.O. Box No. 2,
Madras-600 068,
Tamil Nadu.

National Fertilizers Ltd.,
20, Community Centre,
East of Kailash,
New Delhi-110 024.

Rashtriya Chemicals and
Fertilizers Ltd.,
Chembur, Bombay-400 074,
Maharashtra.

Man Made Textiles Research
Association,
Near Microwave Tower,
Ring Road, Surat-395 002,
Gujarat.

North India Textiles Research
Association,
P. Box No. 123,
Ghaziabad-201 001,
Uttar Pradesh.

The Silk and Art Silk Mills
Research Association,
Dr. Annie Besant Road,
Worli, Bombay-400 025,
Maharashtra.

The South Indian Textiles
Research Association,
Coimbatore Aerodrome P.O.,
Coimbatore-641 004,
Tamil Nadu.

Wool Research Association,
Akbar Camp Road,
P.O. Sandoz Baug, Kokashil Road,
Thane-400 607,
Maharashtra.

Indian Telephone Industries Ltd.,
16-Museum Road,
Bangalore-560 001,
Karnataka.

Indian Telephone Industries,
Naini Complex,
Mirzapur Road,
Naini, Allahabad-211 010,
Uttar Pradesh.

Telecommunication Research Centre,
Khurshid Lal Bhawan,
Janpath, New Delhi-110 001.

Videsh Sanchar Nigam Limited,
Videsh Sanchar Bhawan,
NIG Road, Fort,
Bombay-40 001.

MINISTRY OF DEFENCE

a) DEPARTMENT OF DEFENCE

Institute of Aviation Medicine,
Indian Air Force,
P.O. Vimanapura,
Bangalore-560 017,
Karnataka.

b) DEPARTMENT OF DEFENCE PRODUCTION AND SUPPLIES

Bharat Dynamics Ltd.,
Kanchanbagh Post,
Hyderabad-500 258,
Andhra Pradesh.

Bharat Earth Movers Ltd.,
J.C. Road,
Bangalore-560 002,
Karnataka.

Bharat Electronics Ltd.,
29, Race Course Road,
Bangalore-560 001,
Karnataka.

Goa Shipyard Ltd.,
Vasco-de-Gama,
Goa.

Hindustan Aeronautics Ltd.,
Post Bag No. 1789,
Bangalore-560 017,
Karnataka.

Mazagaon Dock Ltd.,
Dockyard Road,
Mazagaon, Bombay-400 010,
Maharashtra.

Praga Tools Ltd.,
6-68/32, Vivaduguda Road,
Secunderabad-500 003,
Andhra Pradesh.

MINISTRY OF ENERGY

a) DEPARTMENT OF COAL

Bharat Coking Coal Ltd.,
Sijua, Dhanbad,
Bihar.

Central Mine Planning and
Design Institute,
Dharbhanga House,
Ranchi-814 001, Bihar.

Neyveli Lignite Corporation Ltd.,
P.O. Neyveli,
Tamil Nadu.

b) DEPARTMENT OF POWER

Central Power Research Institute,
P.O. Box 1242,
Bangalore-560 012,
Karnataka.

Rural Electrification Corpn.,
Nehru Place,
New Delhi-110 049.

MINISTRY OF HEALTH & FAMILY WELFARE

All India Institute of Hygiene &
Public Health,
110, Chittaranjan Avenue,
Calcutta-700 073,
West Bengal.

All India Institute of
Medical Sciences,
Ansari Nagar,
New Delhi-110 029.

All India Institute of Physical
Medicine & Rehabilitation,
Clark Road,
Mahalaxmi, Bombay-400 034,
Maharashtra.

All India Institute of
Speech & Hearing,
Maharaja College Centenary Hall,
Mysore-570 005,
Karnataka.

BCG Vaccine Laboratory,
Guindy, Madras-600 032,
Tamil Nadu.

Cancer Institute,
110, Mount Road,
Madras-600 018,
Tamil Nadu.

Central Drugs Laboratory,
3, Kyd Street,
Calcutta-700 016,
West Bengal.

Central Food Laboratory,
3, Kyd Street,
Calcutta-700 016,
West Bengal.

Central Leprosy Teaching &
Research Institute,
Post Box-1, Chingleput-603 001,
Tamil Nadu.

Central Research Institute, P.O. Kasauli-173 205, Himachal Pradesh.	Hospital for Mental Diseases, Kanke, Ranchi-830 006, Bihar.	National Malaria Eradication Programme, 22, Alipore Road, Delhi-110 006.
Central Council for Research in Ayurveda & Siddha, S-10, Green Park Ext. Mkt., New Delhi-110 016.	Institute of Post Graduate Medical Education & Research, 244, Lower Circular Road, Calcutta-700 020, West Bengal.	National Tuberculosis Institute, 8 Bellary Road, Bangalore-560 003, Karnataka.
Central Council for Research in Unani Medicine, 5, Panchsheel Shopping Centre, New Delhi-110 017.	Institute of Research in Indigenous System of Medicine, Approach Road, Jogindernagar, Himachal Pradesh.	Pasteur Instt. of Southern India, Coonoor-643 103, Tamil Nadu.
Chittaranjan National Cancer Research Centre, 37, S.P. Mookherjee Road, Calcutta-700 026, West Bengal.	International Institute for Population Studies, Deonar, Bombay-400 088, Maharashtra.	Pharmacopoeal Laboratory for Indian Medicine, Central Govt. Office Building, A/3rd Floor, Kamla Nehru Nagar, Ghaziabad-202 002, Uttar Pradesh.
Department of Serologist & Chemical Examiner, 3 Kyd Street, Calcutta-700 016, West Bengal.	J.N. Institute of Post Graduate Medical Education & Research, Pondicherry-506 006.	Post Graduate Institute of Medical Education & Research, Sector-12, Chandigarh-160 001.
Family Planning Training Research Institute, 381, Sardar Vallabhai Patel Road, Bombay-400 004, Maharashtra.	King's Institute, Guindy, Madras-600 032, Tamil Nadu.	Rural Health Training Centre, Najafgarh, New Delhi-110 043.
Haffkine Institute, Acharya Donde Marg, Parel Road, Bombay-400 004, Maharashtra.	National Institute of Communicable Diseases, 22, Sham Nath Marg, Delhi-110 054.	School of Tropical Medicine, Chittaranjan Avenue, Calcutta-700 073, West Bengal.
Homeopathic Pharmacopoeia Laboratory, Govt. of India Office Complex, Hapur Road, Chungi, Ghaziabad-202 002, Uttar Pradesh.	National Institute of Health & Family Welfare, Near DDA Flats, Munirka, New Delhi-110 067.	Vallabhbhai Patel Chest Institute, Delhi University Campus, Delhi-110 007.
	National Institute of Mental Health & Neuro Sciences, Post Bag No. 2979, Bangalore-560 029, Karnataka.	

MINISTRY OF FOOD & CIVIL SUPPLIES

a) DEPARTMENT OF FOOD

Indian Grain Storage Institute,
Hapur, Uttar Pradesh.

Modern Food Industries Ltd.,
R&D Centre,
Lawrence Road Industrial Area,
New Delhi-110 035.

National Sugar Institute,
Kanpur-208 017,
Uttar Pradesh.

b) DEPARTMENT OF CIVIL SUPPLIES

Bureau of Indian Standards,
Manak Bhavan,
9, Bahadur Shah Zafar Marg,
New Delhi-110 002.

MINISTRY OF HOME AFFAIRS

a) DEPARTMENT OF HOME

Bureau of Police Research & Development,
Block II,
C.G.O. Complex,
Lodhi Road,
New Delhi-110 003.

Central Forensic Science Laboratory,
Central Bureau of Investigation,
Block 4, C.G.O. Complex,
Lodhi Road,
New Delhi-110 003.

Central Forensic Science Laboratory,
30, Goracham Road,
Calcutta-700 014,
West Bengal.

Central Forensic Science Laboratory,
Ramanathapur,
Osmania University Campus,
Hyderabad-500 013,
Andhra Pradesh.

Institute of Criminology & Forensic Science,
4E Jhandewalan Extension,
Rani Jhansi Road,-
New Delhi.

MINISTRY OF HUMAN RESOURCES DEVELOPMENT

a) DEPARTMENT OF CULTURE

National Council of Science Museums,
196, Gurusaday Road,
Calcutta-700 019,
West Bengal.

MINISTRY OF INDUSTRY

a) DEPARTMENT OF INDUSTRIAL DEVELOPMENT

Automotive Research Association of India,
Post Box NO. 825,
Pune-411 104,
Maharashtra.

Bureau of Industrial Cost & Price,
7th Floor, Lok Nayak Bhavan,
New Delhi-110 003.

Central Coir Research Institute,
PO Kavaloor,
Kerala.

Central Machine Tools Institute,
Tumkur Rd., Bangalore,
Karnataka.

Central Pulp & Paper Research Institute,
Saharanpur,
Uttar Pradesh.

Indian Plywood Industries Research Institute,
P.O. No. 2273, Tumkur Road,
Bangalore-560 022,
Karnataka.

Indian Rubber Manufacturers Research Association,
Plot No. 88, Road U.,
Wagle Industrial Estate,
Thane, Maharashtra.

Khadi & Village Industries Commission,
3, Irla Road,
Vile Parle (W),
Bombay-400 056,
Maharashtra.

National Council for Cement & Building Materials,
M-10, South Extension II,
Ring Road, New Delhi-110 049.

National Institute of Design,
Pardi, Ahmedabad,
Gujarat.

National Productivity Council,
38, Golf Links,
New Delhi-110 003.

National Small Industries Corporation Ltd.,
New Okhla Industrial Estate,
New Delhi-110 020.

b) DEPARTMENT OF PUBLIC ENTERPRISES

Andrew Yule & Co. Ltd.,
Yule House, 8, Clive Road,
Dr. Rajendra Prasad Sarani,
Calcutta-700 001,
West Bengal.

Bharat Ophthalmic Glass Ltd.,
Durgapur-10,
West Bengal.

Bharat Heavy Electricals Ltd.,
Hindustan Times House,
New Delhi-110 001.

Bharat Heavy Plates & Vessels Ltd.,
P.O. Box No. 100,
Vishakhapatnam-530 012,
Andhra Pradesh.

Bharat Pump & Compressors Ltd.,
Naini, Allahabad-211 919,
Uttar Pradesh.

Burn Standard Co. Ltd.,
10-C, Hungerford Street,
Calcutta-700 017,
West Bengal.

Heavy Engineering Corporation,
Ranchi-834 004,
Bihar.

Hindustan Cables,
Rupnarainpur,
Distt. Burdwan,
West Bengal.

Hindustan Machine Tools Ltd.,
36, Cunningham Road,
Bangalore-560 052,
Karnataka.

Hindustan Paper Corporation,
Vishal Bhawan,
93, Nehru Place,
New Delhi-110 019.

Hindustan Photo Films Manf.
Co. Ltd.,
Indu Nagar, Ootacamund-643 005,
Tamil Nadu.

Hindustan Salt Ltd.,
Sambhar Salt Ltd.,
Parijat Bhawan, Ashok Marg,
Jaipur-392 998, Rajasthan.

Instrumentation Ltd.,
Kota-324 995,
Rajasthan.

The National Industrial
Development Corp. Ltd.,
Chanakya Bhawan, Vinay Marg,
New Delhi-110 021.

National Instruments Ltd.,
1/1, Raja Subodh Chandra
Mullick Road,
Calcutta-700 032,
West Bengal.

National Newsprint & Paper
Mills Ltd.,
Nepanagar-450 221,
Madhya Pradesh.

Jessep & Co. Ltd.,
63, Netaji Subash Road,
Calcutta-700 001,
West Bengal.

Mining & Allied Machinery Corpn.,
P.O. Durgapur-700 010,
West Bengal.

Scooters India Ltd.,
P.O. Sarojini Nagar,
Lucknow-226 008,
Uttar Pradesh.

Triveni Structurals Ltd.,
Naini, Allahabad-211 919,
Uttar Pradesh.

Tungabhadra Steel Products Ltd.,
P.O. Tungabhadra Dam-583 225,
Karnataka.

c) DEPARTMENT OF CHEMICALS & PETROCHEMICALS

Bengal Chemicals &
Pharmaceuticals Ltd.,
6, Ganesh Chander Avenue,
Calcutta-700 013,
West Bengal.

Bengal Immunity Ltd.,
153, Dharmatala Street,
Calcutta,
West Bengal.

Hindustan Antibiotics Ltd.,
Pimpri, Pune-411 018,
Maharashtra.

Hindustan Organic Chemicals Ltd.,
P.O. Rasayani-410 207,
Maharashtra.

Hindustan Insecticides Ltd.,
HIL R&D Centre,
Udyog Vihar,
Gurgaon, Haryana.

Indian Drugs & Pharmaceutical Ltd.,
IDPL Complex,
Dundahera-122 001, Haryana.

Smithstanistreet Pharmaceutical Ltd.,
18, Convent Road,
Calcutta-700 014,
West Bengal.

MINISTRY OF INFORMATION AND BROADCASTING

Research and Development
Department,
All India Radio,
I.P. Estate, Ring Road,
New Delhi-110 002.

MINISTRY OF LABOUR

Directorate General of Mine Safety
(DGAS),
Dhanbad, Bihar.

MINISTRY OF PETROLEUM AND NATURAL GAS

Engineers India Ltd.,
EIL Building,
Bhikaji Cama Place,
New Delhi-110 066.

R&D Centre,
Indian Oil Corporation,
Sector-13, Faridabad,
Haryana.

Indian Petro-Chemical
Corporation Ltd.,
Baroda, Gujarat.

The Lubrizol India Ltd.,
Delater 9A, S. Pathkar Marg,
Bombay-400 036,
Maharashtra.

Oil and Natural Gas Commission,
Kaulagarh Road,
Dehradun-248 005,
Uttar Pradesh.

Oil India Ltd.,
Duliajan,
Assam.

MINISTRY OF PLANNING

a) DEPARTMENT OF STATISTICS

Indian Statistical Institute,
203, B.T. Road,
Calcutta-700 035,
West Bengal.

MINISTRY OF STEEL AND MINES

a) DEPARTMENT OF MINES

Bharat Aluminium Co. Ltd.,
Punj House, 18, Nehru Place,
New Delhi-110 019.

Bharat Gold Mines Ltd.,
Suvarna Bhavan, Oorgam,
P.O. Kolar Gold Fields-563 120,
Karnataka.

Geological Survey of India,
27, Jawaharlal Nehru Road,
Calcutta-700 013,
West Bengal.

Hindustan Copper Ltd.,
Indian Copper Complex, Ghatshila
Distt. Singhbhum-832 102,
Bihar.

Hindustan Zinc Ltd.,
Z.S. Debari, Udaipur-313 024,
Rajasthan.

Indian Bureau of Mines,
New Secretariat Building,
Nagpur-440 006,
Maharashtra.

Mineral Exploration Corpn. Ltd.,
Seminary Hills,
Nagpur-440 006,
Maharashtra.

DEPARTMENT OF STEEL

Alloy Steel Plant, SAIL,
Durgapur,
West Bengal.

Bhilai Steel Plant, SAIL,
Bhilai,
Madhya Pradesh.

Bokaro Steel Plant, SAIL,
Bokaro Steel City-827 001,
Bihar.

Durgapur Steel Plant, SAIL,
Durgapur,
West Bengal.

Rourkela Steel Plant, SAIL,
Rourkela City,
Orissa.

National Mineral Development
Corporation,
6, Box 52453,
Somajiguda, Hyderabad,
Andhra Pradesh.

R&D Centre for Iron & Steel, SAIL,
P.O. Hinoo,
Doranda,
Ranchi-834 002, Bihar.

MECON, HSL Administration
Building,
Ranchi-834 002,
Bihar.

Salem Steel Plant,
Salem,
Tamil Nadu.

Visvesvaraya Iron & Steel Ltd.,
Bhadravati-577 301,
Andhra Pradesh.

MINISTRY OF TRANSPORT

a) DEPARTMENT OF RAILWAYS

Research Designs & Standards
Organisation,
Manak Nagar,
Lucknow-226 011,
Uttar Pradesh.

Research and Development
Directorate,
Civil Aviation Department,
R.K. Puram, New Delhi-110 066.

Hydraulic Study Department,
Calcutta Port Commissioner,
20, Garden Reach Road,
Calcutta-700 043,
West Bengal.

b) DEPARTMENT OF CIVIL AVIATION

Radio Construction &
Development Unit,
Safdarjung Airport,
New Delhi-110 003.

DEPARTMENT OF SURFACE TRANSPORT

Hindustan Shipyard Ltd.,
Gandhi Gram,
Vishakhapatnam-530 003,
Andhra Pradesh.

Optical Research Laboratory,
Department of Lighthouses &
Light Ships,
P2/2/C2, Tarabolla Road,
Calcutta-700 024, West Bengal.

MINISTRY OF URBAN DEVELOPMENT

Hindustan Prefab Ltd.,
Jangpura,
New Delhi-110 014.

National Buildings Organisation,
'G' Wing Nirman Bhavan,
New Delhi-110 001.

Town & Country Planning
Organisation,
'E' Block, Delhi Vikas Bhavan,
Indraprastha Estate,
New Delhi-110 002.

Housing Urban Development
Corporation Ltd.,
18-A, Jamnagar House,
New Delhi-110 001.

MINISTRY OF WATER RESOURCES

Bhakra Beas Management Board,
(PW), Nangal Township,
Punjab.

Central Water and Power
Research Station,
Khadakwasla, Pune-411 024,
Maharashtra.

National Institute of Hydrology,
Roorkee,
Uttar Pradesh.

Central Board of Irrigation
and Power,
Malcha Marg, Chanakya Puri,
New Delhi-110 021.

Central Soil and Materials
Research Station,
Near IIT Hostel,
Outer Ring Road, Hauz Khas,
New Delhi-110 016.

II. S&T INSTITUTIONS UNDER THE STATE GOVERNMENTS

STATE GOVERNMENT INSTITUTES

LIST OF S&T INSTITUTIONS UNDER THE STATE GOVTS.

I. ANDHRA PRADESH

Andhra Pradesh Agricultural
University & its Research Stations.

A.P. Engineering Res. Lab.,
Hyderabad.

Oil Technological Research Station,
Anantapur.

Power Research Station,
Andhra Pradesh State
Electricity Board,
Hyderabad.

II. ASSAM

Assam Agricultural University
and its Research Stations.

Assam State Electricity Board,
Barapani.

River Research Station,
Chandmari, Gauhati-3.

Soil Conservation Research Survey &
Design, Gauhati.

III. BIHAR

Bihar State Electricity Board,
Patna.

Birsa Agricultural University,
Ranchi.

Irrigation Research Institute,
Khagaul.

Rajendra Krishi Viswavidyalaya
Samastipur.

Soil Conservation Research
Station, Hazaribagh & Jhalgarh.

Training Testing & Research Institute,
PWD, Patna.

IV. GUJARAT

Agricultural Research Station,
Dabhoi.

Cotton Research Sub-Station,
Targadia.

Dry Farming Research Station,
Jam Khambalia.

Dry Farming Research Station,
Chotila.

Engineering Research Station,
Baroda.

Gujarat Agricultural University
& its Research Stations.

Gujarat Fisheries Aquatic Sciences
Research Institute, Okha-361350.

Gujarat Fisheries Aquatic Sciences
Research Station, Sikka-361 140.

Inland Fisheries Research Centre,
Ukai.

Irrigation Demonstration Farm,
Umralla.

Main Irrigation Research Centre,
MM College of Agriculture,
Navsari.

Oilseeds Research Station,
Okha.

Survey & Research Centre,
Deptt. of Fisheries, Okha.

Tobacco Research Station,
Jamalgaon.

V. HARYANA

Haryana Agricultural University,
Hissar & its Research Stations.

Haryana State Electricity Board,
Chandigarh.

VI. HIMACHAL PRADESH

Power Research Unit,
Himachal Pradesh State Electricity
Board, Mandi.

Institute of Research in Indian
System of Medicine,
Joginder Nagar.

Himachal Pradesh Agricultural
University,
Agricultural Complex and its
Research Stations.

Dr. Y.S. Parmar University of
Horticulture & Forestry, Solan.

VII. KARNATAKA

University of Agricultural Sciences,
Bangalore & its Research Stations.

Univ. of Agricultural Sciences
Dharwad & its Research Stations.

Karnataka Engineering Research
Station,
Krishnarajasagar,
Distt. Mandya.

Kidwai Memorial Cancer Institute,
Bangalore-27.

Karnataka State Electricity Board,
Bangalore-560 001.

VIII. KERALA

Estuarine Research Station,
Ayriamthangu.

Fish Breeding Centre, Azhicode.

Fisheries Research Station,
Edathua.

Fresh Water Biological Station,
Malampuzha.

Kerala Engineering Research
Institute, Peechi.

Kerala Agricultural University,
Mannuthy & its Research Stations.

Kerala Highway Research Institute,
Trivandrum.

Limeshell Research Station,
Kumarkom.

Marine Biological Station,
Calicut.

Marine Survey Station, Vizhinjam.

Research Testing & Training
Centre, Vellyani.

State Port Department,
Trivandrum.

Travancore Titanium Products Ltd.,
Trivandrum.

IX. MADHYA PRADESH

Agricultural Research Station,
Khargone.

Central Rice Station, Raipur.

Forest Research Institute, Jabalpur.

Irrigation Research Directorate,
Bhopal.

J.N.K.V. Jabalpur & its Res. Stations.

Maize Breeding Station,
Chhindwara.

Public Health Engineering
Department, Bhopal.

Regional Agricultural Research
Institute, Gwalior.

Sugarcane Research Station,
Sehore.

Wool Research Station, Shivpuri.

X. MAHARASHTRA

Animal Nutrition Research Centre,
Bombay.

Cotton Research Station, Nanded.

Haffkine Institute, Bombay.

The Industrial Chemical Lab., Pune.

Konkan Krishi Vidyapeeth,
Ratnagiri & its Research Stations.

Koyna Project Research Division,
Alore.

Mahatma Phule Krishi
Vidyapeeth, Rahuri, Distt.
Ahmednagar and its Research
Stations.

Maharashtra Engineering Research
Institute, Nasik.

Marathwada Agricultural University,
Parbhani and its Research Stations.

Punjabrao Krishi Vidyapeeth,
Akola & its Research Stations.

School of Applied Research,
Vishrambag, Sangli.

Taraporewala Marine Biological
Research Station, Bombay.

XI. ORISSA

Applied Research & Intensive Fish
Production & Exploitation in
Inland Waters, Kausalyaganj.

Chilka Biological & Technological
Research Station, Balugaon.

Control & Research Lab. (R&D),
Bhubaneswar.

Hirakud Research Station, Hirakud.

Regional Coconut Research
Station, Sakhigopal.

Orissa State Electricity Board,
Bhubaneswar.

Orissa University of Agriculture
& Technology, Bhubaneswar &
its Research Stations.

Technological Station, Balugaon.

Water Management & Salinity
Research Scheme, Chakuli.

XII. PUNJAB

B&R Research Laboratory,
Chandigarh.

High Voltage Res. Lab. Punjab
Engineering College, Chandigarh.

Irrigation & Power Research
Institute, Amritsar.

Punjab Agricultural University and its
Research Stations, Ludhiana.

PWD Public Health Branch, Patiala.

Research Laboratory, Punjab State
Electricity Board, Chandigarh.

Trade Wastes & Effluents Res.
Lab. Patiala.

XIII. RAJASTHAN

Agricultural Research Station,
Durgapur, Jaipur.

Agronomical Research Station,
Jaipur.

Botanical Research Centre, Jaipur.

Cotton Research Centre,
Sriganganagar.

Fruit Research Station Cum
Progeny, Kota.

Grape Research Centre, Jodhpur.

Irrigation Research Centre, Kota.

Pathological Research Centre,
Jaipur.

Regional Research Station,
Borkhera, Kota.

Research Station, Barore.

Research Station, Hanumangarh.

Sukhadia Univ. Udaipur and
its Research Stations.

Sugarbeet Research Centre,
Sriganganagar.

Directorate of Survey & Research,
Ground Water Department,
Jodhpur.

Sugarcane Research Centre, Kota.

Sunflower Botanical Research
Centre, Kota.

XIV. TAMIL NADU

Agricultural Research Station,
Nanjanand.

Agricultural Research Station,
Palur.

Aringar Anna Memorial Cancer
Institute, Kanchipuram.

Banana Research Station,
Aduthurai.

Banana Research Station,
Vadririncipuram.

Central Electronics Testing Lab.,
Kakkalur.

Chemical Testing Laboratory,
Guindy.

Coconut Research Station,
Veppankulam-614 906.

Highway Research Station,
Madras-600 025.

Horticultural Research Station,
Periakulam-626 501.

Institute of Hydraulics &
Hydrology, Poondi-606 023.

Kalaigarn Karunanidhi Agricultural
Research Institute, Vayalagam.

Kallare & Burliar Fruit Station,
Mettupalayam.

King Institute of Preventive
Medicine, Guindy, Madras.

Mechanical & Metallurgical Lab.,
Guindy, Madras.

Multi Crop Experimental Station,
Nanjand-643 004.

Pomological Station, Coonoor.

Poultry Research Station,
Teynempet.

Regional Agricultural Research
Station, Aduthurai.

Regional Research Station,
Paiyur-635 112.

Regional Testing Laboratory,
Madurai.

Regional Agricultural Research
Station, Kovilpatti.

Regional Agricultural Research
Station, Tindivanam.

Rice Research Station, Tirur.

Sheep Breeding Station,
Sandynallah-643 237.

Soil Mechanics & Research
Division, Chepauk.

Sago Research Laboratory,
Salem-636 001.

Sugarcane Breeding Institute,
Coimbatore-641 007.

Tamil Nadu Agricultural University
and its Research Stations

Tamil Nadu Forensic Science
& Chemical Laboratory,
Madras-600 004.

Tamil Nadu State Electricity
Board, Madras.

Paddy Experimental Station,
Ambasamudram.

XV. TRIPURA

Tripura Power Research Centre,
Agartala-799 001.

XVI. UTTAR PRADESH

Agricultural Flood Research
Station, Bahraich & Georaghat.

Allahabad Agricultural Institute,
Allahabad.

Chandra Shekhar Azad Univ. of
Agriculture & Technology,
Kanpur and its Research Stations.

G.B. Pant University of Agriculture
& Technology, Pant Nagar.

Government Fruit Research Station,
Basti.

Government Hill Fruit Research
Station, Chaubatia.

Government Horticultural
Research Institute, Saharanpur.

Irrigation Research Institute,
Roorkee.

N.D. University of Agriculture
& Technology and its
Research Stations.

Regional Agricultural Research
Stations, Bareilly & Hardoi.

Sugarcane Research Station,
Saharanpur.

U.P. Institute of Agricultural
Science, Kanpur.

U.P. PWD Research Institute,
Lucknow.

U.P. State Observatory, Nainital.

XVII. WEST BENGAL

All India Coordinated Rice-
Improvement Project, Kalimpong.

Banana Research Station, Chinsurah.	Improvement of Hill Paddy Scheme, Kalimpong.	River Research Institute, Calcutta.
Bidhan Chandra Krishi Vishwa Vidyalaya, Mohan Nagar.	Institute of Child Health, Calcutta.	Soil Conservation Research Station, Midnapore.
Central Rice Research Zonal Sub-Station, Kalimpong.	Mango Research Station, Malda.	State Agriculture Research Station, Calcutta.
Central Testing Lab., West Bengal State Electricity Board, Calcutta.	Nucleus Vegetable Seed Farm, Borjora.	State Horticultural Research Institute, Krishnanagar.
Horticultural Research Sub-Station for Cataritic Tract, Taldangra.	Oilseeds Research Station, Chinsurah.	Sugarcane Research Station, Bethuadhari.
Horticultural Research Sub-Station for Temperate Fruits, Kalimpong.	Ramie Research Station, Mohitnagar.	Vegetable Research Station, Sukna.
Horticultural Sub-Station for Sub- Tropical Fruits, Kalimpong.	Research Testing & Training Centre on Improved Agriculture Implements, Burdwan.	Vegetable Research Station, Kalimpong.
	Rice Research Station, Chinsurah.	Wheat Research Station, Kalyani.

**III. UNIVERSITIES, DEEMED UNIVERSITIES, AND
INSTITUTES OF NATIONAL IMPORTANCE**

**UNIVERSITIES, DEEMED UNIVERSITIES & INSTITUTES OF
NATIONAL IMPORTANCE**

a) UNIVERSITIES

Agra University, Agra-282 004.	Banaras Hindu University, Varanasi-221 005.	University of Calicut, Calicut-673 635.
Ajmer University, Ajmer-305 001.	Bangalore University, Bangalore-560 056.	Chandra Shekhar Azad University of Agriculture & Technology, Kanpur-208 002.
Alagappa University, Alagappa Nagar, Karaikudi-623 004.	M.S. University of Baroda, Baroda-390 002.	Cochin University of Science and Technology, Cochin-682 022.
Aligarh Muslim University, Aligarh-211 002.	Berhampur University, Berhampur-760 007.	University of Delhi, Delhi-110 007.
Allahabad University, Allahabad.	Bhagalpur University, Bhagalpur-812 007.	Devi Ahilya Vishwavidyalaya, Indore-450 001.
Amravati University, Amravati-444 604.	Bharathiar University, Coimbatore-641 046.	Dibrugarh University, Dibrugarh-786 004.
Andhra University, Waltair, Vishakhapatnam-530 003.	Bharathidasan University, Tiruchirapalli-620 024.	Dr. Harisingh Gour Vishwavidyalaya, Sagar-470 003.
Andhra Pradesh Agricultural University, Rajendra Nagar, Hyderabad-500 030.	Bhavnagar University, Bhavnagar-364 002.	Dr. M.G.R. Medical University, Guindy, Madras-600 032.
Andhra Pradesh Open University, Hyderabad-500 482.	Bhopal University, Bhopal-462 006.	Dr. Y.S. Parmar University of Horticulture and Forestry, Solan-173 230.
Anna University, Guindy, Madras-600 025.	Bidhan Chandra Krishi Vishwavidyalaya, P.O. Mohunpur, Nadia-741 252, Haringhata Distt.	Garhwal University, Srinagar-246 174, Garhwal Distt.
Annamalai University, Annamalainagar-608 002.	Bihar University, Musaffarpur-842 001.	Gauhati University, Gauhati-781 014.
Arunachal University, Itanagar-791 111.	Birsa Agricultural University, Kanke, Ranchi-834 006.	Goa University, Panjim-403 005.
Assam Agricultural University, Jorhat-785 013.	University of Bombay, Bombay-400 032.	University of Gorakhpur, Gorakhpur-273 001.
Avadh University, Faizabad-224 001.	University of Bundelkhand, Jhansi-400 001.	Govind Ballabh Pant University of Agricultural & Technology, Pant Nagar-263 145, Distt. Nainital.
Awadhesh Pratap Singh University, Rewa-486 003.	University of Burdwan, Burdwan-713 104.	
	University of Calcutta, Calcutta-700 073.	

Gujarat Agricultural University, Sardar Krushinagar, Dantiwada, (Banaskantha)-385 506.	Jawaharlal Nehru Technological University, Hyderabad-500 028.	Kuvempu University, B.R. Project, Shimoga Distt., Karnataka-577 115.
Gujarat Ayurved University, Jamnagar-361 008.	Jawaharlal Nehru University, New Mehrauli Road, New Delhi-110 067.	Kurukshetra University, Kurukshetra-132 119.
Gujarat University, Ahmedabad-380 009.	Jiwaji University, Gwalior-474 011.	Lalit Narayan Mithila University, Darbhanga-846 004.
Gulbarga University, Gulbarga-585 106.	University of Jodhpur, Jodhpur-342 001.	University of Lucknow, Lucknow-226 007.
Guru Ghasidas University, Bilaspur-495 001.	Kakatiya University, Warangal-506 009.	University of Madras, Madras-600 005.
Gurunanak Dev University, Amritsar-143 005.	University of Kalyani, Kalyani-741 235.	Madurai Kamaraj University, Madurai-625 021.
Haryana Agricultural University, Hissar-125 004.	Kameshwar Singh Darbhanga Sanskrit University, Darbhanga-846 006.	Magadh University, Bodh Gaya-824 234.
Himachal Pradesh University, Shimla-171 005.	Kanpur University, Kanpur-208 024.	Maharshi Dayanand University, Rohtak-124 001.
Himachal Pradesh Krishi Vishwavidyalaya, Palampur-176 062.	Karnataka University, Dharwad-580 003.	Mahatma Gandhi University, Kottayam-686 562.
University of Hyderabad, Hyderabad-500 001.	Kashi Vidyapeeth, Varanasi-221 002.	Mahatma Phule Krishi Vidyapeeth, Distt. Ahmednagar, Rahuri-413 772.
Indira Gandhi Krishi Vishwavidyalaya, Raipur-492 001.	University of Kashmir, Srinagar-190 006.	Mangalore University, Light House Hills, Mangalore-575 003.
Indira Gandhi National Open University, YMCA Cultural Centre, New Delhi-110 001.	University of Kerala, Trivandrum-695 034.	Manipur University, Canchipur, Imphal-795 003.
Indira Kala Sangit Vishwavidyalaya, Khairagarh-491 881.	Kerala Agricultural University, Vellanikkara, Trichur-680 654.	Marathwada University, Aurangabad-431 004.
Jadavpur University, Calcutta-700 032.	Kerala State Open University, Trivandrum-695 037.	Marathwada Agricultural University, Parbhani-431 004.
University of Jammu, Jammu-180 001.	Konkan Krishi Vidyapeeth, Dapoli, Maharashtra-415 712.	Meerut University, Meerut-250 005.
Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur-482 004.	Kota Open University, Kota-324 009.	Mohanlal Sukhadia University, Udaipur-301 001.
	Kumaun University, Nainital-263 001.	

Mother Teresa Women's University,
Kodaikanal-624 102,
Tamil Nadu.

University of Mysore,
Mysore-570 05.

Nagarjuna University,
Nagarjunanagar,
Guntur-522 510.

Nagpur University,
Nagpur-440 001.

Nalanda Open University,
Nalanda.

Narendra Dev University of
Agriculture and Technology,
Narendra Nagar,
Faizabad-224 229.

North Bengal University,
Rajarammohunpur,
Darjeeling-734 430.

North Eastern Hill University,
Lower Lachumiere,
Shillong-793 001.

North Gujarat University,
Patan-384 265.

Orissa University of
Agricultural & Technology,
Bhubaneswar-751 003.

Osmania University,
Hyderabad-500 007.

Punjab University,
Chandigarh-160 014.

Patna University,
Patna-800 005.

Pondicherry University,
Pondicherry-605 001.

University of Poona,
Pune-411 007.

Punjab Agricultural University,
Ludhiana-141 004.

Punjabi University,
Patiala-147 002.

Punjabrao Krishi Vidyapeeth,
Akola-444 104.

Purvanchal University,
Jaunpur-222 002.

Rabindra Bharati University,
Calcutta-700 050.

University of Rajasthan,
Jaipur-302 004.

Rajasthan Agricultural University,
Bikaner-334 001.

Rajasthan Vidyapeeth,
Udaipur.

Rajendra Agricultural University,
Pusa,
Samastipur-848 125.

Ranchi University,
Ranchi-834 008.

Rani Durgawati Vishwavidyalaya,
Jabalpur-482 001.

Rashtriya Sanskrit Sansthan,
GN-4, Vishal Enclave,
Raja Garden,
New Delhi-110 027.

Rashtriya Sanskrit Vidyapeeth,
Tirupati-517 507.

Ravishankar University,
Raipur-492 010.

Rohilkhand University,
Bareilly-243 001.

University of Roorkee,
Roorkee-247 667.

Sambalpur University,
Jyoti Vihar,
Sambalpur-768 019.

Sampurnanand Sanskrit
Vishwavidyalaya,
Varanasi-221 002.

Sardar Patel University,
Vallabh Vidyanagar-388 120

Saurashtra University,
Rajkot-360 005.

Shere-Kashmir University of
Agricultural Sciences &
Technology,
P.B. No. 262,
Srinagar-190 001,
Jammu & Kashmir.

Shivaji University,
Vidyanagar,
Kolhapur-416 004.

Shri Jagannath Sanskrit
Vishwavidyalaya,
Puri-752 001.

SNDT Women's University,
1 Nathibai Thackersey Road,
Bombay-400 020.

South Gujarat University,
Surat-395 007.

Sri Krishnadevaraya University,
Anantapur-515 003.

Sri Padmavati Mahila
Vishwavidyalaya,
Tirupati-517 502.

Sri Venkateswara University,
Tirupati-517 502.

Tamil University,
Thanjavur-613 001.

Tamilnadu Agricultural University,
Coimbatore-641 003.

Telugu University,
Kala Bhavan,
Hyderabad-500 004.

Tilak Maharashtra Vidyapeeth,
Pune-411 037.

Tripura University,
P.O. Agartala College,
Agartala-799 004.

University of Agricultural Sciences,
Hebbal,
Bangalore-560 065.

University of Agricultural Sciences,
Dharwad-580 005.

A.P. University of Health Sciences,
Vijayawada-520 005.

Utkal University,
Vani Vihar,
Bhubaneswar-751 004.

Vidya Sagar University,
Midnapore-721 101.

Vikram University,
Ujjain-456 010.

Visva Bharati,
Santiniketan-731 235.

b) DEEMED UNIVERSITIES

Avinashilingam Institute of
Home
Science and Higher Education
for Women,
Coimbatore-641 043.

Banasthali Vidyapith,
Banasthali (Raj.)-304 022.

Birla Institute of Technology,
Mesra,
Ranchi-835 215.

Birla Institute of
Technology & Science,
Pilani-333 031.

Central Institute of English
and Foreign Languages,
Hyderabad-500 007.

Central Institute of Higher
Tibetan Studies,
Sarnath,
Varanasi.

Dayalbagh Educational Institute,
Agra-282 005.

Gandhinagar Rural Institute,
Gandhinagar,
Madurai-624 302.

Gujarat Vidyapith,
Ahmedabad-380 014.

Gurukula Kangri Vishwavidyalaya,
Hardwar-249 404.

Indian Agricultural Research
Institute,
New Delhi-110 012.

Indian Institute of Science,
Bangalore-560 012.

Indian School of Mines,
Dhanbad-826 004.

Indian Veterinary Research Institute,
Izat Nagar, U.P. 243 122.

International Institute for
Population Sciences,
Deonar,
Bombay-400 088.

Jamia Millia Islamia,
Jamia Nagar,
New Delhi-110 025.

National Law School of India,
Central College Campus,
Bangalore-560 001.

School of Planning & Architecture,
Indraprastha Estate,
New Delhi-110 002.

Sri Sathya Sai Institute of
Higher Learning,
Prasanthinilayam-515 136,
Anantapur.

Tata Institute of Social Sciences,
Sion-Trombay Road,
Deonar, Bombay-400 088.

Thapar Institute of Engineering
and Technology,
Patiala-147 001.

c) INSTITUTES OF NATIONAL IMPORTANCE

All India Institute of
Medical Sciences,
Ansari Nagar,
New Delhi-110 029.

Dakshina Bharat Hindi
Prachar Sabha,
P.B. No. 1419,
Madras-600 017.

Indian Institute of Technology,
Powai,
Bombay-400 076.

Indian Institute of Technology,
Haus Khas, New Delhi-110 016.

Indian Institute of Technology,
Kanpur-208 016.

Indian Institute of Technology,
Kharagpur-721 302.

Indian Institute of Technology,
Madras-600 036.

Indian Statistical Institute,
203 Barrackpore,
Trunk Road,
Calcutta-700 035.

Postgraduate Institute of
Medical Education & Research,
Chandigarh-160 012.

Shree Chitra Tirunal Institute for
Medical Sciences & Technology,
Trivandrum-695 011.

Sanjay Gandhi Postgraduate
Institute of Medical Sciences,
Rae-Bareilly Road,
Lucknow-226 001.

**IV. PRIVATE INDUSTRIES / JOINT SECTOR / STATE PUBLIC
SECTOR UNDERTAKINGS RECOGNISED BY DEPARTMENT
OF SCIENTIFIC AND INDUSTRIAL RESEARCH**

**LIST OF PRIVATE INDUSTRIES/JOINT SECTOR/STATE PUBLIC SECTOR UNDERTAKINGS
RECOGNISED BY DEPARTMENT OF SCIENTIFIC AND INDUSTRIAL RESEARCH**

21st Century Electronics Private Limited, C-14, Community Centre, Safdarjang Development Area, New Delhi-110 016.	Aegis Chemical Industries Ltd., National Highway No. 8, Vapi, Dist. Valsad, (Gujarat).	Alfa-Laval (India) Limited, Mustafa Building, 7A, Sir P.M. Road, Bombay-400 045.
A.K.G. Electronics Industries, 4/2, Middleton Street, Calcutta-700 071.	Afco Industrial & Chemicals Limited, 9, Wallace Street, Fort, Bombay-400 001.	Alkyl Amines Chemicals Limited, Nirman Vyapar Kendra, 401-407, Plot No. 10, Sector 17, DBC Vashi, New Bombay-400 703.
A.V. Thomas & Company Limited, Post Box No. 520, Willingdon Island, Cochin-682 003.	The Ahmedabad Manufacturing Calico Printing Company Limited, (Calico Polyester Fibre Div), Outside Jamalpur Gate, Ahmedabad-380 022.	Allied Resins & Chemicals Ltd., 13, Camac Street, Calcutta-700 017.
Aceto Chemicals Pvt. Ltd., 22, Barabourne Road, Calcutta-700 001.	Ahura Chemical Products P. Ltd., 82, Mahakali Road, Andheri (East), Bombay-400 093.	Alved Products 5, Chandra Bagh Avenue, Madras-600 004.
Acharya Chemicals, B-2/11, Jawahar Darshan, Manpada Road, Dombivali East, Thane-421 501.	Ahuja Radios, 215, Okhla Industrial Estate, Okhla, New Delhi-110 020.	Ambalal Sarabhai Enterprises Limited, Post Box No. 231, Wadi-Wadi, Baroda-390 007.
Acumac, A-2, HMT Industrial Estate, Bangalore-560 031.	Ajay Metachem Pvt. Limited, 784, Deccan Gymkhana, Opp : Kamla Nehru Park, Pune-411 004.	Amco Batteries Limited, 6th Floor, Centenary Building, M.G. Road, Bangalore-560 001.
The Addisons Paints & Chemicals Limited, Post Box No. 851, Huzur Garden, Sembiam, Madras-600 001.	Albright Morarji & Pandit Limited, Raj Mahal, 3rd Floor, 84-D, Veer Nariman Road, Bombay-400 020.	Amines & Plasticizers Limited, Noonmati, Gauhati (Assam).
Advanced Micronic Devices Private Limited, 516, 'Swastik Chambers', 5th Floor, Sion Trombay Road, Chembur, Bombay-400 070.	Alchemie Research Centre Private Limited, Crescent House, 19, Walchand Hirachand Marg, Ballard Estate, Bombay-400 038.	Amphetronix Limited, Plot No. 105, Bhosari Industrial Area, Post Box No. 1, Pune-411 026.
Advanced Microdevices Pvt. Ltd., Arya Nagar, Ambala Cantt-133 001.	Alembic Chemical Works Company Limited, Alembic Road, Baroda-390 003.	Amsar Private Limited, 2, Hormuz Mansion, 72-B, Desai Road, Bombay-400 026.
Advani Oerlikon Limited, Ador House, 6, K. Dubhash Marg, G.P.O. Box No. 1546, Bombay-400 023.	Alembic Glass Industries Ltd., Alembic Road, Baroda-390 003.	Amrutanjan Limited, 42/45, Luz Church Road, Mylapore, Madras-600 004.

Anabond Private Limited,
Type-II 36, VSI Campus,
Thiruvanniyur,
Madras-600 041.

Analog & Digital Systems,
1 B, Lavelle Mansions,
1/2, Lavelle Road,
Bangalore-560 001.

Andhra Pradesh Electronics
Development Corpn. Ltd.,
Parisrama Bhavan, 8th Floor,
Basheerbagh,
Hyderabad-500 029.

The Andhra Pradesh Paper
Mills Limited,
Rajamundry-523 105.

Andhra Sugars Limited,
(Sugarcane Dev. Division),
Venkatarayapuram,
Post Box No. 2,
Tanuku-534 215.

The Anglo-French Drug Company
(Eastern) Limited,
41, 3rd Cross, SSI Area,
Block No. 5,
Rajaji Nagar,
Bangalore-560 010.

The Anil Starch Products Limited,
Anil Road,
Ahmedabad-380 025.

Anjaleem Enterprise & Consultants
Private Limited,
101, B.N. Chambers,
R.C. Dutt Road,
Vadodara-390 005.

The Anup Engineering Limited,
Anil Starch Premises,
Anil Road,
Ahmedabad-380 025.

Anup Malleables Limited,
B, Waterloo Street,
Calcutta-700 069.

Apollo Tyres Limited,
Cherupushpam Building,
VIth Floor,
Shanmugham Road,
Cochin-682 011.

Applied Electro-Magnetics
Private Limited,
36-37, New Okhla Industrial
Complex (DSIDC)
Phase-I,
New Delhi-110 020.

Applied Electronics Limited,
Aplab House, A-5/6,
Wagle Industrial Estate,
Thane,
Bombay-400 604.

Aquapharm Chemical Company
Private Limited,
S-113/2, MIDC Bhosari,
Pune-411 026.

Aristo Pharmaceuticals Pvt. Ltd.,
Mercantile Chambers,
12, J.N. Herdia Marg,
Bombay-400 038.

Arlabs Limited,
6, Malhotra House,
Opp : G.P.O.,
Bombay-400 001.

Armour Chemicals Private Limited,
158, CST Road,
Kalina,
Santacruz (East),
Bombay-400 098.

Arphi Electronics Pvt. Limited,
Prabhadevi Industrial Estates,
Block No. 17, 1st Floor,
Veer Savarkar Marg,
Bombay-400 025.

The Arvind Mills Limited,
Post Box No. 10010,
Naroda Road,
Ahmedabad-380 025.

ASCU Hickson Limited,
7-A, Elgin Road,
Calcutta-700 014.

Asha Nitrocellulose Private
Limited,
Asha House, Plot No. 808/C,
Dr. Ambedkar Road,
Dadar T.T.,
Bombay-400 014.

Ashok Leyland Limited,
19, Rajaji Salai,
Madras-600 001.

Ashok Manufacturing Company
Private Limited,
37, Pachkuian Road,
Post Box No. 305,
New Delhi-110 001.

Asian Cables Corporation Ltd.,
Ceat Mahal,
463, Annie Besant Road,
Worli,
Bombay-400 025.

Asian Chemical Works (Bombay)
Private Limited,
124/126 Shyamaldas Gandhi Marg,
Princess Street,
Bombay-400 002.

Asian Paints (India) Limited,
Nirmal, 5th Floor,
Nariman Point,
Post Box No. 1946,
Bombay-400 021.

Assam Electronics Development
Corporation Limited,
2nd Floor, NTC Building,
Guwahati Club,
GNB Road,
Guwahati-781 003.

The Associated Cement Co. Ltd.,
Cement House,
121, Maharashi Karve Road,
Bombay-400 020.

Associated Instruments
Manufacturers (I) Private Limited,
Sunlight Building,
26-27, Asaf Ali Road,
New Delhi-110 002.

Associated Laboratories
Private Limited,
83-B, Dr. Annie Besant Road,
Worli, Bombay-400 018.

Astra Research Centre India,
Post Box No. 359,
Bangalore-560 005.

Astra-IDL Limited,
12th Mile on Bellary Road,
Venkata Kattigenahalli Vill.,
Yalahanka,
Bangalore-560 063.

ATIC Industries Limited,
Atul P.O.-396 020,
Distt : Valsad (Gujarat).

The Atlas Cycle Industries Limited,
Atlas Nagar,
Atlas Road,
Sonepat-131 001.

Atsuan Chemical Corporation,
22, Janki Niwas,
N.C. Kelkar Road,
Dadar, Bombay-400 028.

Atul Glass Industries (P) Ltd.,
3/9, Deshbandu Gupta Road,
Karol Bagh,
New Delhi-110 055.

The Atul Products Limited,
Ashoka,
Rasala Marg,
Mithakhali Cross Road,
Ellisbridge,
Ahmedabad-380 006.

Audco India Limited,
L&T House,
Ballard Estate,
Post Box No. 278,
Bombay-400 038.

Aurelec Trust,
Prayogashala-Auroville,
Kottakuppam-605 104.

Auroelectronics,
A-2, Thattanchavadi Industrial Estate,
Pondicherry-605 009.

Aurofood Private Limited,
1st Laurent Bazar Street,
Pondicherry-605 001.

Autofield Engineers Pvt. Ltd.,
B-5, Sushila Apartments,
Nal Stop, Karve Road,
Pune-411 004.

Automac (Madras) Pvt. Ltd.,
D-1, Ambattur Industrial Estate,
Madras-600 058.

Automatic Electric Limited,
Rectifier House,
570-Naigaum Cross Road,
Wadala, P.B. No. 7103,
Bombay-400 031.

B.M. Thakkar & Co. Pvt. Ltd.,
14, Hamam Street,
Rajbahadur Mansion,
2nd Floor, Fort,
Bombay-400 001.

Bajaj Auto Limited,
Bombay-Poona Road,
Akurdi, Poona-411 035.

Bajaj Tempo Limited,
Bombay-Poona Road,
Akurdi, Poona-411 035.

Bakelite Hylam Limited,
Tiecion,
18, Dr. E. Moses Road,
Bombay-400 011.

Ballarpur Industries Limited,
Ballarpur,
Distt. Chandra Pur,
(Maharashtra).

Balmer Lawrie & Company Ltd.,
21, Netaji Subhash Road
Calcutta-700 001.

Bansilal & Sons,
3, G.T. Road,
Sahibabad,
Dist. Ghaziabad.

Bradma of India Limited,
Volkart Building,
19, J.N. Herdia Marg,
Bombay-400 038.

Baroda Electric Meters Limited,
Anand-Sojitra Road
Vithal Udyognagar-388 121,
Vallabh Vidyanagar,
Dist. Kheda (Gujarat).

The Baroda Rayon Corporation
Limited,
196, Backbay Reclamation,
Hoechst House,
Nariman Point,
Bombay-400 025.

BASF Limited,
Maybaker House,
Sudamakalu Ahira Marg
Post Box No. 19108,
Bombay-400 025.

Bata India Limited,
30 Shakespear Sarani,
P.O. Box No. 9079,
Calcutta-700 017.

Bayer India Limited,
Express Tower,
Nariman Point,
Bombay-400 021.

BECO Engineering
Company Limited,
23/7, Delhi Mathura Road,
Ballabgarh-121 004.

Bells Controls Limited,
Bells House, 21, Camac Street,
Calcutta-700 017.

Berger Paints India Limited,
32, Chowringhee Road,
Calcutta-700 071.

Best & Crompton Limited,
312, Anna Salai, P.B. No. 6911,
Madras-600 018.

Bhagwati Spherocast Limited,
I, Krishna Society,
Ellisbridge,
Ahmedabad-380 006.

The Bharat Battery Manufacturing
Company Private Limited,
238-A, Acharya J.C. Bose Road,
Calcutta-700 020.

Bharat Bijlee Limited,
Electric Mansion, 6th Floor,
Appasaheb Marathe Marg,
Bombay-400 025.

Bharat Forge Company Limited,
Mundhwa,
Pune Cantonment,
Pune-411 036.

Bharat Fritz Werner (P) Ltd.,
Peenya,
Yeshwanthpur (P.O.),
Bangalore-560 022.

Bharat Serums & Vaccines
Private Limited,
Bombay Mutual Terrace,
IIIrd Floor,
534, Sandhurst Bridge,
Bombay-400 007.

Bharat Starch & Chemicals Ltd.,
Thapar House,
124, Janpath,
New Delhi-110 001.

Bharatia Electric Steel Co. Ltd.,
8, Anil Maitra Road,
Calcutta-700 019.

Bharatia Cutler-Hammer Limited,
1st Floor, Block E216,
Acharya J.C. Bose Road,
Calcutta-700 017.

The Bharatiya Agro Industries
Foundation,
Uruli-Kanchan,
Haveli-Taluka,
Pune-412 207.

Bhaskar Stoneware Pipes (P) Ltd.,
Ishwar Nagar,
New Delhi-110 065.

Bhilai Engineering Corporation
Limited,
Industrial Area,
Post Box No. 31,
Bhilai-490 001.

Bhoruka Steel Limited,
Whitefield Road,
Mahadevapura Post,
Bangalore-560 048.

Bhukanvala Diamond Tools
(P) Limited,
Post Box No. 469, Meadow House,
Nagindas Master Road,
Fort, Bombay-400 023.

Bicycle and Sewing Machine
Research and Development Centre,
B-38-39, Focal Point,
Ludhiana-141 010.

Bihar Alloy Steels Limited,
Hadley House,
Old Hazaribagh Road,
Ranchi-834 001.

Bimetal Bearings Limited,
Huzur Gardens,
Sembiam, Madras-600 011.

Binatone Electronics Private
Limited,
23/4788-90, Ansari Road,
Daryaganj,
New Delhi-110 002.

Biocon India Private Limited,
20th K.M. Hosur Road,
Hebbagodi-562 158,
Bangalore.

Biological E. Limited,
18/1 & 3, Azamabad,
Hyderabad-500 020.

Biomass Energy Systems (P) Ltd.,
638, Poonamalle High Road,
Madras-600 029.

Birla Institute of Science
& Technology,
Entrepreneur's Park,
BIT Mesra-835 215,
Ranchi.

The Birla Institute of
Scientific Research,
78, Syed Amir Ali Avenue,
Calcutta-700 019.

Birla Research Institute for
Applied Sciences,
Birla Gram-456 331,
Nagda (M.P.).

Blue Star Limited,
1st Floor, Block 'E',
216, Acharya Jagadish
Chandra Bose Road,
Calcutta-700 017.

Bombay Dyeing & Manufacturing
Company Limited,
Neville House,
J.N. Herdia Marg,
Ballard Estate,
Bombay-400 038.

The Bombay Oil Industries
Private Limited,
Kanmour House,
281-87, Narsi Natha Street,
Bombay-400 009.

Bombay Paints & Allied
Product Ltd.,
Corridor Road,
Gavanpada Chembur,
Bombay-400 074.

Bombay Tyres International
Limited,
Hay Bunder Road,
Bombay-400 033.

Bommidala Central Research
Institute,
Manglagiri Road,
P.B. No. 100,
Guntur-522 001.

The Boots Co. (India) Limited,
17, R. Kamani Marg,
Ballard Estate,
Bombay-400 038.

Borewell Equipment Company,
Unit No. 2 & 3,
Electronic Complex,
Kushaiguda,
Hyderabad-500 762.

BPL Systems & Projects Limited,
System House,
Palghat-678 007.

Brakes India Limited,
180 Mount Road,
Madras-600 006.

Britannia Industries Limited,
5/1A Hungerford Street,
Calcutta-700 017.

British Physical Laboratory
India Limited,
BPL Works,
Palghat-678 007,
Kerala

BTX Chemicals Private Limited,
C1/B/3 Shed,
Nandesari Petrochemical
Ind. Estate,
Nandesari Distt. Baroda,
Baroda

Bush Boake Allen (India) Limited,
1-5, Seven Wells Street,
St. Thomas Mount,
Madras-600 016.

Bush India Limited,
P.O. Box No. 4127,
Sukh Sagar,
N.S. Patkar Road,
Bombay-400 007.

Business Forms Limited,
6A, Middleton Street,
Calcutta-700 071.

Cable Corporation of India,
Poonam Chambers,
Shivsagar Estate,
Dr. Annie Besant Road., Worli,
Bombay-400 018.

Cadila Laboratories Private Limited,
244, Ghodasar,
Post Box No. 9004,
Mani Nagar,
Ahmedabad-380 008.

Camlin Private Limited,
Camlin House,
J.B. Nagar,
Andheri (East),
Bombay-400 059.

Camphor & Allied Products
Limited,
Jahangir Building,
133, Mahatma Gandhi Road,
Bombay-400 023.

Caprihans India Limited,
Block-D, Shivsagar Estate,
Dr. Annie Besant Road, Worli,
Bombay-400 018.

Carbon & Chemicals India Limited,
39/137-A Krishnaswami Cross Road,
Post Box No. 3528,
Cochin-682 035.
Kerala

Carborundum Universal Limited,
28, Rajaji Road,
Post Box No. 1677,
Madras-600 001.

Carburettors Limited,
118, Anna Salai,
Madras-600 002.

Catalyst (India) Private Limited,
1006, Embassy Towers,
207, Nariman Point,
Bombay-400 021.

Cawnpore Sugar Works Limited,
Sutherland House,
Post Box No. 257,
Kanpur-208 001.

Ceat Tyres of India Limited,
463, Dr. Annie Besant Road,
Bombay-400 025.

Cellulose Products of India
Limited,
National Chambers,
Off. No. 4&5, 2nd Floor,
Ashram Road,
Ahmedabad-380 009.

Cement Corporation of
India Limited,
Shakuntala Apartments,
59, Nehru Place,
New Delhi-110 019.

Cemindia Company Limited,
Apeejay House,
Dinshaw Vacha Road,
Post Box No. 11056,
Bombay-400 020.

Central Distillery and
Breweries Limited,
20, Netaji Subhas Road,
Daryaganj, New Delhi-110 002.

Central Institute of Road Transport
(Training and Research),
Bhosari, Pune-411 026.

The Century Textiles Industries
Limited,
Century House,
Dr. Annie Besant Road,
Worli, Bombay-400 025.

Cephram Laboratories
Private Limited,
M-134, IInd Floor,
Cannaught Circus
(Opp. Super Bazar),
New Delhi-110 001.

Chandras' Chemicals Enterprises
Private Limited,
P-35, C.I.T. Road,
Calcutta-700 014.

Chemisol Adhesives Private
Limited,
Devkaran Mansion,
41, Princess Street,
Bombay-400 002.

Chemiequip Limited,
306, Green House,
Green Fort Street,
Fort, Bombay-400 023.

Chemosyn Private Limited,
38, Suren Road,
Andheri (East)
Bombay-400 093.

Chloride India Limited,
Exide House,
59-E, Chowringhee Road,
Calcutta-700 020.

Chromatography & Instruments
Company,
122, Makarpura Industrial Estate,
Baroda-390 010.

Cibatul Limited,
P.O. Atul-396 020,
Distt. Valsad (W. Rly.),
(Gujarat).

Cimmco Limited,
Birla Nagar,
Gwalior-474 004.

Cipla Limited,
Bombay Central,
Bombay-400 008.

Citurgia Biochemicals Limited
(Sturdia Chemicals Division),
Niville House,
J.N. Heredia Marg,
Ballard Estate,
Bombay-400 038.

Clutch Auto Limited,
702, Sahyog,
58, Nehru Place,
New Delhi-110 019.

Coats of India Limited,
Transport Depot Road,
Calcutta-700 088.

Colour Chem Limited,
Ravindra Annexe Dineshaw
Vacha Road,
194, Churchgate Reclamation,
Bombay-400 020.

Cominco Binani Zinc Limited,
Binani Buildings,
38, Strand Road,
Calcutta-700 001.

Consolidated Coffee Limited,
Pollibetta-571 215,
Kodagu Distt.
(Karnataka).

Continental Device of India Limited,
C-120, Naraina Industrial Area,
New Delhi-110 028.

Convertor Adhesives and
Chemicals Pvt. Ltd.,
5A, Rashmi M.L. Dhanukar Marg,
Bombay-400 026.

Coromandal Indag Products
India (Pvt.) Ltd.,
29, Police Commissioner's Road,
Egmore, Madras-600 008.

Coromandal Prodorite Limited,
Tiam House Annexe,
2, Jahangir Street,
Madras-600 001.

Cosmo Films Limited,
30, Community Centre,
Saket, New Delhi-110 017.

Coventry Spring & Engg.
Cò. Pvt. Ltd.,
23, Ganesh Chandra Avenue,
Calcutta-700 013.

Crafts De Fluorescent,
Plot No. 221,
Goregaon Mulund Link Road,
LBS Marg, Bhandup,
Bombay-400 078.

Crompton Greaves Limited,
1, Dr. V.B. Gandhi Marg,
Bombay-400 023.

Curekraft Chemicals (India)
Private Limited,
179, T.H. Road,
Madras-600 081.

Cynamid India Limited,
Nyloc House,
254-D-2, Dr. Annie Besant Road,
Post Box No. 9109,
Bombay-400 025.

Ceat Tyres of India Limited
(Glass Fibre Division),
463, Dr. Annie Besant Road,
Bombay-400 025.

D&H Secheron Electronics
Private Limited,
44/46, Industrial Estate,
Kila Maidan,
Post Box No. 3,
Indore-452 006.

D.B. Electronics,
S. No. 43/5/1 Ghorpadi,
Mundhawa Road,
Pune-411 036.

D.C.M. Limited (Data Products),
Kanchenjunga Building,
18, Barakhamba Road,
New Delhi-110 001.

D.C.W. Limited,
Nirmal 3rd Floor,
241, Backbay Reclamation,
Nariman Point,
Bombay-400 021.

Dabur Research Foundation,
8/3, Asaf Ali Road,
New Delhi-110 002.

DAI ICHI Karkaria Private Limited
Liberty Building,
New Marine Lines,
Sir Vithaldas Thakersey Marg,
Bombay-400 020.

Dalmia Institute of Scientific
& Industrial Research,
Rajgangpur,
Post Box No. 2,
Dist. Sundargarh,
Rajgangpur-770 017.

The Dandeli Ferro Alloys
Private Limited,
Uttara Kanara Distt.,
Dandeli-581 325.

Danfoss (India) Limited,
706-707, Surya Kiran,
19, Kasturba Gandhi Marg,
New Delhi-110 001.

Darbari Industries,
24, Mahatma Gandhi Marg,
Allahabad-211 001.

Dass Hitachi Private Limited,
65/15, New Rohtak Road,
New Delhi-110 005.

Databyte Equipment
Private Limited,
200, Narayan Peth,
Laxmi Road,
Pune-411 030.

Daurala Sugar Works
(Unit of D.C.M. Limited),
Kanchenjunga Building,
18, Barakhamba Road,
New Delhi-110 001.

DCM Toyota Limited,
Kanchenjunga Building,
18, Barakhamba Road,
New Delhi-110 001.

Deccan Mechanical & Chemical
Industries Private Limited,
78, Bhosari Industrial Estate,
Pune-411 026.

Deepak Nitrite Limited,
9/10, Kunj Society,
Alkapuri,
Baroda-390 005.

Development Consultants
Private Limited,
24-B, Park Street,
Calcutta-700 016.

Devidayal Electronics &
Wires Limited,
Gupta Mills Estate,
Darukhana Reay Road,
Bombay-400 010.

Dexo Laboratories Private Limited,
6-3-1102, Raj Bhawan Road,
Somajiguda,
Post Box No. 1514,
Hyderabad-500 482.

The Dhampur Sugar Mills Limited,
13, Civil Lines,
Bareilly-243 005.

Dharam Pal Prem Chand Limited,
4873, Chandni Chowk,
Delhi-110 006.

The Dharamsi Morarji Chemicals
Company Limited,
Prosect Chamber,
317/21, Dr. D.N. Road,
Bombay-400 001.

Diamines & Chemicals Ltd.,
1, National Chambers,
2nd Floor,
Near Dipali Theatre,
Ashram Road,
Ahmedabad-380 009.

Digital Electronics Limited,
202, Owners Industrial Estate,
Pitamber Lane, Mahim,
Bombay-400 016.

Digital Innovation (Pvt.) Limited,
Digital House,
59, Vishwas Colony, Alkapur,
Vadodara-390 005.

Digital Instruments &
Controls Pvt. Ltd.,
11, Green Ways Road,
Madras-600 028.

Dinesh Rubber Industries
(A Div. of Rustom Mills
India Limited),
Brij House,
Opp. Gujarat High Court,
Stadium Road,
Ahmedabad-380 014.

Dip-Lab Private Limited,
(Formerly Pesticides Research Lab.),
146/8-B, Lake Gardens,
Calcutta-700 045.

DLF Universal Limited,
Sector-11,
Model Town,
Faridabad-121 006.

Dr. Beck & Company
(India) Limited,
Arcadia, 10th Floor,
195, Nariman Point,
Bombay-400 021.

Driescher Panicker Switchgear
Private Limited,
No. 18, Jankiram Colony,
Arumbakkam,
Madras-600 106.

Ductron Castings Limited,
B-15, Industrial Development Area,
Uppal, Hyderabad-500 039.

Dunlop India Limited,
Dunlop House,
57-B, Mirza Ghalib Street,
Calcutta-700 016.

Duphar Interfran Limited,
F-5, Shiv Sagar Estate,
Dr. Annie Besant Road,
Worli, Bombay-400 018.

Dey's Medical Stores
(Mfg) Limited,
6/D, Neely Sengupta Sarani,
Calcutta-700 087.

Dyes & Dispersing Agents
Private Limited,
Central Bank Building,
3rd Floor, Block No. 72,
Homi Modi Street,
Bombay-400 023.

Dynavision Limited,
Near Dr. Vikram Sarabhai
Instronic Estate,
Kottivakkam,
Madras-600 041.

E. Merck (India) Limited,
Shiv Sagar Estate 'A',
Post Box No. 16554,
Dr. Annie Besant Road, Worli,
Bombay-400 018.

E.I.D. Parry (India) Limited,
Dare House,
Post Box No. 12,
Madras-600 001.

Earnest Healthcare Limited,
Earnest Estate,
Bombay Agra Road,
Rajendra Nagar,
Indore-452 012.

East Anglia Plastics (I) Limited,
145, Jessore Road,
Calcutta-700 089.

Eddy Current Controls
(India) Limited,
Eddypuram,
Post Box No. 40,
Chalakudy-680 307.

Eicher Goodearth Limited,
16-A, Asaf Ali Road,
Hyay Marg,
New Delhi-110 002.

Eiko Computers Private Limited,
301, 3rd Floor,
Devtha Plaza Residency Road,
Bangalore-560 025.

Elcompo Electronic Industries
Private Limited,
1-2, Instronic Campus,
Thiruvanniyur,
Madras-600 041.

Elektramerics Systems Pvt. Ltd.,
Electra House,
6/1-A, Poona Satara Road,
Poona-411 037.

Electrical Manufacturing
Company Limited,
EMC Gardens,
136, Jessore Road,
Calcutta-700 037.

Electro Anil Limited,
B-5 & B-6,
Veerasandra Industrial Estate,
Veerasandra Village,
Anekal Taluk,
Bangalore-560 027.

Electro Pneumatics and
Hydraulics (I) Pvt. Ltd.,
72 MIDC, Marol Industrial Area,
Cross Road-C,
Off. Mahakali Caves Road,
Andheri (East), Bombay.

Electron & Electrons
'Mist House',
695-A, Sadashiv Peth,
Laxmi Road,
Opp. Vijay Cinema,
Pune-411 030.

Electronic & Engineering Company,
EEC House, Plot No. C-27,
Laxmi Industrial Estate,
Andheri (West),
Bombay-400 058.

Electronic Automation Pvt. Ltd.,
74, 1st Block R.T. Nagar,
Bangalore-560 032.

Electronic Research Private Limited,
17th K.M. Old Madras Road,
Post Box No. 5,
Bangalore-560 049.

Electronic Research &
Development Centre,
Keltron House,
Vellayambalam,
Trivandrum-695 033.

Electronic Systems Punjab Limited,
B-18, Phase VII,
S.A.S. Nagar,
Chandigarh-160 051.

Electronics Consortium
Private Limited,
5A/1-2 & 3, Ansari Road,
Daryaganj,
New Delhi-110 022.

Electronics Limited,
Atma Ram House, VIIth Floor,
1, Tolstoy Marg,
New Delhi-110 001.

Electrotherm Machines (India)
Private Limited,
414/1, GIDC Phase-III, Vatva,
Ahmedabad-382 445.

ELGI Equipments Limited,
India House,
Trichy Road,
Coimbatore-641 018.

Elico Private Limited,
B-17, Sanatnagar Industrial Estate,
Hyderabad-500 018

Ellora Steels Limited,
118, Ansal Bhawan,
Kasturba Gandhi Marg,
New Delhi-110 001.

Elpro International Limited,
Nirmal, Nariman Point,
Bombay-400 021.

EM Electronix Private Limited,
158, 3rd Main Industrial Town,
Rajaji Nagar,
Post Box No. 4444,
Bangalore-560 044.

Emco Electronics,
109, Industrial Area,
Sion, Bombay-400 022.

Encardio-Rite Electronics
Private Limited,
440/11-A, New T.G. Civil Lines,
New Hyderabad,
Lucknow-226 007.

Energy & Environment
Consultants Pvt. Ltd.,
5-A, Lord Sinha Road,
Calcutta-700 071.

The Enfield India Limited,
29, Eldams Road,
Post Box No. 1053,
Madras-600 018.

Engel India Machines &
Tools Limited,
1, Taratala Road,
Calcutta-700 088.

Engine Valves Limited,
Maithri Buildings (Premises),
Door No. 32,
Cathedral Road,
Madras-600 086.

The English Electric Company
of India Limited,
D-2, Gillander House,
Netaji Subhas Road,
Calcutta-700 001.

Ennore Foundaries Limited,
Ennore,
Madras-600 057.

Epsilon Electronic Equipments
& Components Limited,
B-2, Electronic Industrial Estate,
Kushaiguda,
Hyderabad-500 762.

ESBI Transmissions Private Limited,
8-Camac Street (6th Floor),
Calcutta-700 017.

Escorts Limited
(Corporate R&D Centre),
25 KM, Mathura Road,
Faridabad-121 001.

Escorts Limited
(Motor Cycle & Scooter Division),
11, Scindia House,
Connaught Place,
New Delhi-110 001.

Escorts Tractors Limited
(Research & Development Centre)
Escorts House, Roshnara Road,
Delhi-110 007.

Eskayef Limited,
Devanahalli Road,
Off. Old Madras Road,
Bangalore-560 049.

Essen Deinki,
22, Industrial Area Phase-II,
Chandigarh-160 002.

Essen Electronics
(A Div. of Essen Computer (P) Ltd.,
A/7, GIDC Electronic Complex,
Sector-15,
Gandhinagar-382 015.

Ester India Limited,
75-76, Amrit Nagar
(Behind NDSE-I),
New Delhi-110 003.

Ethnor Limited,
30, Forjett Street,
Post Box No. 9332,
Bombay-400 036.

Everest Building Products Limited,
Block-D, Shivsagar Estate,
Dr. Annie Besant Road,
Worli, Bombay-400 018.

Ewac Alloy Limited,
L&T House,
Narottam Morarji Marg,
Ballard Estate,
Bombay-400 038.

Excel Industries Limited,
184/87, Swami Vivekananda Road,
Post Box No. 7474,
Jogeshwari (W),
Bombay-400 102.

Expert Industrial Engravers
Private Limited,
Plot No. 18/4, 19/4,
Hadapsar Industrial Estate,
Pune-411 013.

Emico Elicon (India) Limited,
Anand Sojitra Road,
Vallabh Vidyanagar-388 120,
Gujarat.

FDC Limited
(Formerly FDC Pvt. Ltd.),
66, Laxmi Building,
Sir P.M. Road, Fort,
Bombay-400 001.

Fedders Lloyd Corporation
Limited,
Punj House,
M-13, Connaught Place,
New Delhi-110 001.

Ferro Alloys Corporation Limited,
Shreeram Bhavan,
Tumsar-441 912.

Fertiplant Engineering Company
Limited,
188, Lake Road,
Bhandup,
Bombay-400 078.

FGP Limited,
9, Wallace Street,
Fort, Bombay-400 001.

Ficom Organics Limited,
12, Tulsiani Chambers,
Nariman Point,
Bombay-400 021.

FIE Research Institute,
Ganganagar P.O.,
Ichalkaranji-416 116,
Maharashtra.

Flakt India Limited,
6, Poonam Building,
5/2, Russel Street,
Calcutta-700 071.

Flavours & Essences Private
Limited,
Mount View Lalithamahal Road,
Mysore-570 011.

Fon Electronic Switching Systems
Private Limited,
Post Box No. 3203,
Sales Office No. 3,
1st 'B' Main Road,
Gangenhalli Extension,
Bangalore-560 032.

Forbesons Tech. Centre
Private Limited,
Post Box No. 1,
Bombay-Poona Road,
Kasarwadi, Pune-411 034.

Formica India Division
(The Bombay Burmah Trade
Corpn. Limited),
9, Wallace Street,
Bombay-400 001.

Fort Gloster Industries Limited
(Cable Division),
31, Chowringhee Road,
Calcutta-700 016.

Four Eyes Research (P) Limited,
798, Bhandarkar Road,
Pune-411 004.

Fouress Engineering (India)
Private Limited,
Mahalaxmi Chambers,
22, Bhulabhai Desai Road,
Bombay-400 026.

Franco-Indian Pharmaceuticals
Pvt. Limited,
20, Dr. E. Moses Road,
Bombay-400 011.

Fuel Instruments & Engineers
Private Limited,
Block No. A,
Industrial Estate,
Ichalkaranji-416 115,
Maharashtra.

Furmanite Nicco Limited,
Nicco House,
2, Hare Street,
Calcutta-700 001.

G.G. Dandekar Machine
Works Limited,
Dandekarwadi,
Bhivandi-421 302,
Dist. Thane.

G.T.C. Industries Limited,
Tobacco House, Vile Parle,
Bombay-400 056.

Gajra Gears Private Limited,
Elve Chambers, Green Street,
Fort, Bombay-400 023.

Galaxy Organics (P) Limited,
A-8, Shaheen,
153-154, R.C. Marg,
Chembur, Bombay-400 074.

Gammon India Limited,
Gammon House,
Veer Savarkar Marg,
Prabhadevi,
Bombay-400 025.

Ganesh Medicament
Private Limited,
145-A, Dr. Viegas Street,
Kalbadevi Road,
Bombay-400 002.

Garware-Wall Ropes Limited,
Chowpati Chambers,
Sandhurst Bridge,
Bombay-400 007.

Garg Associates Private Limited,
D-6, Industrial Area-3,
Meerut Road,
Ghaziabad-201 003.

Garware Paints Limited,
401, Marine Chambers,
43, Sir V. Thackersey Marg,
Post Box NO. 11492,
Bombay-400 020.

Garware Plastics & Polyester
Private Limited,
L-6, Chikalthana Industrial Area,
P.O. Cidco Colony,
Aurangabad-431 003.

Geep Industrial Syndicate Limited,
28, South Raod,
Allahabad-211 001.

Gemmological Institute of India,
29-30, Gurukul Chambers,
187-189, Mumbadevi Road,
Bombay-400 002.

Genelec Limited,
Magnet House,
Narottam Morarji Marg,
Ballard Estate,
Bombay-400 038.

General Foods Research Centre,
214, Tulsiani Chambers,
Nariman Point,
Bombay-400 018.

Gharda Chemicals Limited,
48, Hill Road, Bandra,
Bombay-400 050.

Gitanjali Chemicals Private
Limited,
B/75, Mittal Tower,
Nariman Point,
Bombay-400 021.

Glindia Limited
(Formerly : Glaxo Laboratories),
Dr. Annie Besant Road,
Worli, Bombay-400 025.

The Godavari Sugar Mills Limited,
Fazalbhoy Buildings,
Mahatma Gandhi Road,
Fort, Bombay-400 023.

Godfrey Phillips India Limited,
Chakala, Andheri (East),
Bombay-400 099.

Godrej & Boyce Mfg. Company
Limited,
Pirojsha Nagar,
Eastern Express Highway,
Bombay-400 079.

Godrej Soaps Limited,
Pirojsha Nagar,
Eastern Express Highway,
Vikhroli, Bombay-400 079.

Gokak Patel Volkart Limited,
Gokak Mills Division,
Forbes Building,
Charanjit Rai Marg,
Post Box No. 580,
Bombay-400 001.

Golden Meadows Apiaries,
Village Maron,
P.O. Dayalpur,
Jalandher-144 419.

Goodlass Nerolac Paints Limited,
P.B. No. 16322,
Ganpatrao Kadam Marg,
Lower Parel,
Bombay-400 013.

The Gramophone Company
of India Limited,
5, Old Court House Street,
Calcutta-700 001.

Graphite India Limited,
14, Netaji Subhash Road,
Calcutta-700 001.

Grauer & Weil (India) Limited,
Sukh Sagar, N.S. Patkar Marg,
Chowpatti, Bombay-400 007.

Greaves Cotton & Company
Limited,
I. Dr. V.B. Gandhi Marg,
Post Box No. 91,
Bombay-400 023.

Greaves Foseco Limited,
Jolly Bhawan No. 2, 1st Floor,
New Marine Lines,
Bombay-400 020.

Greaves Semi Conductors Limited,
Road No. 1,
Medak District,
Patancheru-502 319.

Grindwell Norton Limited,
Army & Navy Building,
148, Mahatma Gandhi Marg,
Bombay-400 023.

Guest Keen Williams Limited,
3-A, Shakespear Sarani,
Calcutta-700 071.

Gufic Limited,
Kabilpore,
Navasari,
(Gujarat).

Gujarat Alkalies and
Chemicals Limited,
'Yash Kamal',
Sayaji Kund,
Baroda-390 005.

Gujarat Communication &
Electronics Limited,
Anurag Commercial Centre,
Race Course,
Baroda-390 005.

Gujarat Insecticides Limited,
8, Darshan Society,
Near Sardar Stadium,
Navrangpura,
Ahmedabad-380 009.

Gujarat Machinery Manufacturers Limited,
Vithal Udyog Nagar,
Karamsad-388 325
Gujarat.

Gujarat Narmada Valley Fertilizers Co. Ltd.,
P.O. Narmadanagar-392 015,
Distt. Bharuch (Gujarat).

Gujarat State Fertilizers Company Limited
(Polymer Unit),
P.O. Fertilizer Nagar-391 750,
Distt. Baroda.

Gujarat State Fertilizers Company Limited
P.O. Fertilizer Nagar,
Baroda-391 750.

Gujchem Distillers India Limited,
Chaitanya, F-I, Seth C.G. Road,
Opp. Associated Petrol Pump,
Ellisbridge,
Ahmedabad-380 006.

Gujarat Petrosynthese Limited,
Thakkar Building,
Shivaji Road,
Baroda-390 001.

Gumpro Chem,
12, Sidhpura Industrial Estate,
S.V. Road, Goregaon (West),
Bombay-400 062.

The Guindy Machine Tools Private Limited,
Pallikaranai P.O.,
Madras-601 302.

The Gurdit Institute Private Limited,
'Hill View' Attikolla,
Dharwad-580 007.

H. Guru Instruments Private Limited,
1-B, Ho-Chi-Minh Sarani,
Calcutta-700 071.

Haffkine Institute for Training Research and Testing,
Acharya Donde Marg,
Parel, Bombay-400 012.

Haffkine Bio-Pharmaceutical Corporation Ltd.,
Acharya Donde Marg,
Parel, Bombay-400 012.

Hakotronics (P) Limited,
Dadaji Kondded Cross Marg,
Bombay-400 027.

Harbanslal Malhotra & Sons Limited,
P-12, New C.I.T. Road,
Calcutta-700 073.

Hardcastle & Waud Manufacturing Co. Ltd.,
Brabourne Stadium,
87, Veer Nariman Road,
Bombay-400 020.

Hargovind Bajaj Research & Development Centre,
D-3/A, Panki Industrial Estate,
Kanpur-208 022.

Harish Textiles Engineering Limited,
19, Parsi Panchayat Road,
Andheri (East),
Bombay-400 089.

Haryana State Electronics Development Corporation Limited,
1556, Sector-18-D,
Chandigarh-160 018.

Hawkins Cookers Limited,
101, Makers Towers,
Cuffe Parade,
Bombay-400 005.

Helios Antennas & Electronics,
234, Avvani Shanmugam Road,
Gopalapuram,
Madras-600 086.

Herdillia Chemicals Limited,
Air India Building,
Nariman Point,
Bombay-400 021.

Hi-Media Laboratories Private Limited,
23, Vadnani Industrial Estate,
Lal Bahadur Shastri Marg,
Bombay-400 086.

Hickson & Dadajee Limited,
Shree Pant Bhawan,
Mama Shahib Warerkar Bridge,
Post Box No. 4126,
Bombay-400 007.

Hico Products Limited,
Post Box No. 16483,
771, Pt. Satavalekar Marg,
Mahim, Bombay-400 016.

High Energy Batteries (India) Limited,
109, Nugambakkam High Road,
Madras-600 034.

Himalaya Machinery Private Limited,
608, GIDC,
Makarpura Industrial Area,
Baroda-390 010.

Hind High Vacuum Company (Pvt.) Limited,
Site No. 17,
Peenya Industrial Area, Phase-I,
Bangalore-560 058.

Hind Rectifiers Limited,
Lake Road, Bhandup,
Bombay-400 078.

Hinditron Computer Systems & Consultants Private Limited,
69, A.L. Jagmohandas Marg,
Bombay-400 006.

The Hindoostan Spinning & Weaving Mills Limited,
Sir Vithaldas Chambers,
16, Bombay Samachar Marg,
Bombay-400 025.

Hindustan Aluminium Corporation Limited,
Century Bhavan,
Dr. Annie Besant Road,
Bombay-400 025.

Hindustan Brown Boveri Limited,
Brown Boveri House,
264-265, Dr. Annie Besant Road,
Bombay-400 025.

Hindustan Ciba-Geigy Limited,
14, Jamshedji Tata Road,
Bombay-400 020.

Hindustan Cocoa Products Limited,
Cadbury House,
19, Bhula Bhai Desai Road,
Bombay-400 027.

HCL Ltd. (Instruments Div.),
806-808, Siddharth,
96, Nehru Place,
New Delhi-110 019.

Hindustan Dorr-Oliver Limited,
Dorr-Oliver House,
Chakala, Andheri (East),
Bombay-400 099.

Hindustan Electro-Graphite
Limited,
Bhilwara Bhawan,
40-41, Community Centre,
New Friends Colony,
New Delhi-110 065.

Hindustan Everest Tools Limited,
Dohil Chambers,
46, Nehru Place,
New Delhi-110 019.

Hindustan Ferodo Limited,
Post Box No. 9213,
Lal Bahadur Shastri Marg,
Ghatkopar,
Bombay-400 086.

Hindustan Hydraulics (P) Limited,
G.T. Road, Suranussi,
Jalandhar-144 027.

Hindustan Latex Limited,
Latex Bhavan,
Mahilamandiram Road,
Poojapura,
Trivandrum-695 012.

Hindustan Lever Limited,
Hindustan Lever House,
165-166, Backbay Reclamation,
Bombay-400 020.

Hindustan Motors Limited
(Auto Division),
9/1, R.N. Mukherjee Road,
Calcutta-700 001.

Hindustan Motors Limited,
9/1, R.N. Mukherjee Road,
Calcutta-700 001.

Hindustan Sanitaryware and
Industries Limited,
2, Red Cross Place,
Post Box No. 2359,
Calcutta-700 001.

HMM Limited,
Patiala Road, Nabha,
(Punjab).

Hoechst India Limited,
Hoechst House, Nariman Point,
193, Backbay Reclamation,
Post Box No. 11123,
Bombay-400 021.

The Hukam Chand Mills Limited,
52, Shilnath Camp,
Mill Premises,
Indore-452 003.

Hutti Gold Mines
Company Limited,
239, Old Tumkur Road (Opp. Cpri),
Rajmahal Vilas Extension,
Bangalore-560 080.

Hybrid Electronic Systems
Limited,
Hybrid House,
Plot No. F-17,
Opp. Seepz, Andheri (East),
Bombay-400 093.

Hyderabad Allwyn Limited,
Allwyn Bhawan,
Sanat Nagar,
Hyderabad-500 018.

Hyderabad Batteries Limited,
8-2-601, Road No. 10,
Banjara Hills,
Hyderabad-500 034.

Hyderabad Industries Limited,
Sanat Nagar,
Hyderabad-500 018.

Hyderabad Science Society,
12-2-460, Mehdiapatnam,
Hyderabad-500 028.

Hydraulics Limited,
118, Annasalai,
Post Box No. 331,
Madras-600 002

HCL Limited
(Communication Division),
806-808, Siddharth,
96, Nehru Place,
New Delhi-110 019.

Hiremath Chemicals Limited,
6, Nawab Building,
327, Dr. D.N. Road, Fort,
Bombay-400 001.

IAEC India Limited,
196, Lal Bahadur Shastri Marg,
Bhandup,
Bombay-400 078.

Ideal Engineers Hyderabad
Limited,
B-14, Co-operative Industrial
Estate,
Balanagar P.O.,
Hyderabad-500 037.

Ideal Jawa (India) Pvt. Ltd.,
Mysore-570 020.

IDL Chemicals Limited,
Kukatpalli,
Sanatnagar (IE) P.O.,
Post Bag No. 1,
Hyderabad-500 018.

ITC Ltd.
(Agro Business Division),
37, Chowringhee Street,
Calcutta-700 071.

IEL Limited
(Explosives & Fertilisers Division),
34, Chowringhee Road,
Calcutta-700 071.

IEL Limited
34, Chowringhee Road,
Calcutta-700 071.

IEL Limited
(Fibres Division),
34, Chowringhee Road,
Calcutta-700 071.

Imeco Ultrasonics,
Post Box No. 16643,
19-C, Shalimar Industrial Estate,
Matunga, Bombay-400 019.

Incab Industries Limited,
9, Hare Street,
Calcutta-700 001.

Indchem Electronics Limited,
P.B. No. 5059,
47, Developed Plots for Electricals &
Electronics Industry,
Seevaram Vill. Purungudi,
Madras-600 096.

India Carbon Limited,
Noonmati,
Guwahati.

India Fibrericks & Insulation
Company Limited,
Post Bag No. 1,
Bokaro Steel City,
Pin-827 001.

India Navigation Company,
A-103, Mayapuri Industrial Area,
Phase-II, Rewari Line,
New Delhi-110 064.

India Pistons Limited,
Hazur Gardens,
Sembiam,
Madras-600 011.

Indian Aluminium Company Limited,
1, Middleton Street,
Calcutta-700 071.

Indian Communication Network
Limited,
Network House,
D-10, Commercial Centre,
Poorvi Marg, Vasant Vihar,
New Delhi-110 057.

Indian Design Centre
Private Limited,
1-B, Peenya Industrial Area,
Bangalore-560 058.

Indian Dyestuff Industries Limited,
Mafatlal Centre,
Vidhan Bhavan Marg,
Nariman Point,
Bombay-400 021.

Indian Farmers Fertilizers
Co-operative Ltd.,
34, Nehru Place,
New Delhi-110 019.

The Indian Hume Pipe
Company Limited,
Construction House,
Walchand Hirachand Marg,
Ballard Estate,
Bombay-400 038.

Indian Lead (P) Ltd.,
917, Tulsiani Chambers,
Nariman Point,
Bombay-400 021.

Indian Organic Chemicals Limited,
New Excelsor Buildings,
6th Floor, Wallace Street,
Bombay-400 001.

Indian Oxygen Limited,
Oxygen House,
P-43, Taratala Road,
Calcutta-700 088.

Indian Plastics & Chemicals
Private Limited,
Opp. Railway Station,
Dandeli-581 325.

Indian Plastics Ltd.,
Poisar Bridge Kandivli,
Bombay-400 067.

The Indian Plywood Mfg.
Company Limited,
9, Wallace Street, Fort,
Bombay-400 001.

The Indian Rayon Corporation
Limited
(Unit : Jay Shree Textiles),
Veraval Road,
Junagarh Unit JCT,
Veraval-362 266.

Indian Registrar of Shipping,
72, Maker Towers 'F',
7th Floor, Cuffe Parade,
Bombay-400 005.

Indian Tools Manufacturers
(A Division of Zenith Limited),
Moti Mahal,
Church Gate Reclamation,
Bombay-400 020.

The Indian Yeast
Company Limited,
4, Bankshall Street,
Post Box No. 70,
Calcutta-700 001.

Indo Gulf Explosives Limited,
B-2/13, Africa Avenue,
Safdarjung Enclave,
New Delhi-110 029.

Indo National Limited,
609, Mount Road,
IVth Floor, Laxmi Bhavan,
Madras-600 006.

Indo Swing Limited,
Narsapur Road,
Balanagar,
Hyderabad-500 037.

Indo-American Hybrid Seeds,
Post Box No. 7099,
2nd 'A' Main 17th Cross,
Banashankari II State,
Bangalore-560 070.

Indo-Pharma Pharmaceutical
Works Limited,
Mehta Mahal, 3rd Floor,
15, Mathew Road,
Post Box No. 3571,
Bombay-400 004.

Indofil Chemicals Company
(A Division of Modipon Limited),
Nirlon House,
Dr. Annie Besant Road,
Worli, Bombay-400 025.

Indrol Lubricants &
Specialities Limited,
White House-91, Walekar Road,
Bombay-400 006.

The Industrial Development
Corporation of Orissa Limited,
Post Box No 78,
Bhubaneshwar-751 001.

Industrial Perfumes Limited, Hay Bunder Road, Tank Road, Sewri P.O., Bombay-400 033.	International Instruments Limited, 140, Hosur Road, Bangalore-560 034.	Jagson Pal Pharmaceuticals Limited, 18, Bhogal Road, Jangpura, New Delhi-110 014.
Industrial Research Corporation, No. 19, 12th Main Road, Malleshwaram (West), Bangalore-560 055.	Ion Exchange India Limited, Tiecicon House, Post Box No. 6273, Dr. E. Moses Road, Bombay-400 011.	Jain Plastic & Chemicals Private Limited, 152, Polan Peth, Post Box No. 20, Jalgaon-425 001.
Infar (India) Limited, Off Saturday Club Building, 7 Wood Street, P.B. No. 9070, Calcutta-700 016.	IPCA Laboratories Private Limited, 48, Kandivli Industrial Estate, Bombay-400 067.	Jaisun & Hutchison, 11, Zackeria Avenue, Madras-600 008.
Institute of Typographical Research, Ganapathi Chowk, 64, Budhwar Peth, Laxmi Road, Pune-411 002.	ITC Limited, Virginia House, 37, Chowringhee Road, Calcutta-700 071.	Jamna Auto Industries, Hemkunt Tower, 10th Floor, Nehru Place, New Delhi-119 019.
Instrument Research Associate Pvt. Ltd., Post Box No. 2304, 79/1-2, Magadi Road, Bangalore-560 023.	IVP Limited, Shashikant N. Redij Marg, Ghorupded, Bombay-400 033.	The Jay Engineering Works Limited, 23, Kasturba Gandhi Marg, New Delhi-110 001.
Instrument Techniques Private Limited, B-2, Co-operative Industrial Estate, Balanagar, Hyderabad-500 037.	J. Mitra & Bros. Private Limited, Post Box No. 4330, 1411, Chiranjiv Tower, 43, Nehru Place, New Delhi-110 019.	Jaya Hind Industries Limited, Akurdi, Pune-411 035.
Instrumentation Engineer Pvt. Ltd., Plot No. 1, 2 & 3, Phase-III, I.D.A. Jeedimetla, Hyderabad-500 855.	J.K. Industries Limited, 7, Counsel House Street, Calcutta-700 001.	Jaya Hind Sciaky Limited, D-1 Block, Plot No. 18/1, Chinchwad, Pune-411 019.
Integrated Process Automation Private Limited, A-173, 1st Stage 4th Cross Peenya Industrial Estate, Bangalore-560 058.	J.K. Synthetics Limited, Kamala Tower, Kanpur-208 001.	Jayant Industrial & Scientific Research, 13, Si-naphalwadi, Mazagaon, Bombay-400 010.
International Computers Indian Manufacturer Limited, Ahmednagar Road, Mile Post No. 4, Pune-411 014.	J.M.A. Industries Limited, 29, Community Centre, East of Kailash, New Delhi-110 065.	Jayant Vitamins Limited, Dosigaon Industrial Area, Post Box No. 27, Ratlam-457 001.
International Data Management Limited, Nehru House, 4, Bahadur Shah Zafar Marg, New Delhi-110 002.	Jagatjit Cotton Textiles, Mills Limited, Vill. Chohal, Distt. Hoshiarpur, (Punjab).	Jayramdas Patel Scidntific Research Foundation, 705, Eros Apartments, 54, Nehru Place, New Delhi-110 019.
	Jagatjit Industries Limited, P.O. Jagatjit Nagar-144 802, Distt. Kapurthala, (Punjab).	Jaysynth Dyechem Private Limited, 303, Navjivan, 125/127, Kazi Sayed Street, Bombay-400 003.
		JBA Printing Ink Limited, Lal Bahadur Shastri Marg, Bhandup, Bombay-400 078.

Jenson & Nicholson (India) Limited,
225, Acharya J.C. Bose Road,
Calcutta-700 020.

Jindal Aluminium Limited,
16th K.M. Tumkur Road,
Bangalore-560 073.

Johnson & Johnson Limited,
30, Forjett Street,
Post Box No. 9301,
Bombay-400 036.

Joseph Lesile Agencies (P) Limited,
11/12, Appejay House, 4th Floor,
Post Box No. 668,
139, Appolo Street,
Bombay-400 001.

Jupiter Radios (Regd.),
C-46, Okhla Industrial Area,
Phase-II, New Delhi-110 020.

Jyoti Ceramic Industries Limited,
Plot No. C-21, B. Road,
Nice Satpur,
Nasik-422 007.

Jyoti Limited,
P.O. Chemical Industries,
Industrial Area,
Baroda-390 003.

K.C.P. Limited,
Ramakrishna Building,
2, Victoria Crescent Road,
Madras-600 005.

K.E.C. International Limited,
Kamani Chambers,
R.H. Kamani Marg,
Ballard Estate,
Bombay-400 038.

K.G. Khosla Compressors Limited,
1, Deshbandhu Gupta Road,
New Delhi-110 055.

K.J. Research Foundation,
941, Poonamallee High Road,
Madras-600 084.

Kadevi Engg. Company (P) Limited,
A-1, A-2 Electronic Complex,
Kosaiguda,
Hyderabad-500 762.

Kalinga Engineers Limited,
Kalinga House,
Rasulgarh,
Bhubaneshwar-751 010.

Kanazia Digital Systems
Private Limited,
93, Mittal Tower, B-Wing,
Nariman Point,
Bombay-400 021.

Kankariya Chemical Industries
Limited,
B.N. Chambers,
R.C. Dutt Road,
Baroda-390 005.

Kanpha Labs.,
Post Box No. 3307,
48 Meg, Officer's Colony,
Banaswadi Road,
Bangalore-560 033.

Karnataka Oxygen Limited,
Whitefield Road,
Mahadevapura Post,
Bangalore-560 048.

Karnataka Soaps & Detergents
Limited,
Bangalore Pune Highway,
Rajaji Nagar Industrial Suburb,
Post Box No. 5531, Poona H.W.,
Bangalore-560 055.

Kasila Farms Private Limited,
902, Paigah Plaza,
5-9-30/5, Basheerbagh,
Hyderabad-500 029.

Kaveri Engg. Industries Limited,
Pillur House,
7A/4A, Reynold's Road,
Cantonment,
Tiruchirapalli-620 001.

Kay Laboratories Private Limited,
119/120, Khanna Estate,
Agra Road, Vikroli West,
Bombay-400 079.

KEGG Farms Private Limited,
8th Floor, Eros Apartments,
56, Nehru Place,
New Delhi-110 019.

Keltron Power Devices Limited,
Keltron House,
Trivandrum-695 033,
(Kerala).

Kelvinator of India Limited,
Atma Ram House,
1 Tolstoy Marg,
New Delhi-110 001.

Kelvinator of India Limited
(Automotive Division),
Atma Ram House,
1, Tolstoy Marg,
New Delhi-110 001.

Keonics Magnavision Computers
Limited,
2987, 12th Main,
HAL IInd Stage, Indiranagar,
Bangalore-560 038.

The Kerala Minerals &
Metals Limited,
M.C. 14/94, Contonment South
Beach Road,
Quilon-691 991.

Kerala State Drugs &
Pharmaceuticals Limited,
Kalavoor,
Alleppey-688 522,
(Kerala)

Kesar Enterprises Limited,
Oriental House,
7, Jamshedji Tata Road,
Bombay-400 020.

Khaitan Electricals Limited,
46-C, J.L. Nehru Marg,
Calcutta-700 071.

Khandelwal Ferro Alloys Limited,
Nirmal, Nariman Point,
Bombay-400 021.

Khandelwal Laboratories Pvt. Limited,
79/87, D. Lad Path,
Post Box No. 7808,
Bombay-400 033.

Khatauli Manure Mills,
G.T. Road,
Post Box No. 9,
Distt. Muzaffar Nagar,
Khatauli-251 201.

Kinetic Engineering Limited,
D-1, Block,
Plot No. 18/2, Chinchwad,
Pune-411 019.

Kirloskar Brothers Limited,
Udyog Bhawan, Tilak Road,
Pune-411 002.

Kirloskar Cummins Limited,
Kothurd,
Pune-411 029.

Kirloskar Electric Company Limited,
Industrial Suburb,
Rajaji Nagar,
Bangalore-560 010.

Kirloskar Kisan Equipments Limited,
Karve Road, Kothurd,
Pune-411 029.

Kirloskar Oil Engines Limited,
13, Laxman Rao Kirloskar Road,
Kirkee, Pune-411 003.

Kirloskar Pneumatic Company
Limited,
Kadapsar Industrial Estate,
Pune-411 013.

Klockner Windsor (India) Limited,
Plot No. E-6, U2 Road,
Wagle Industrial Estate,
Thane-400 604.

Kody Medical Electronics Limited,
Post Box No. 8596,
Type II/37, Second Phase,
Dr. V.S.I. Estate,
Thiruvannamiyur,
Madras-600 041.

The Kolhapur Steel Limited,
Pune-Bangalore Road,
Shiroli (Pulachi),
Kolhapur-416 122.

Kores (India) Limited,
Post Box No. 6558, Plot No. 10,
Off. Dr. E. Moses Road,
Kores House Worli,
Bombay-400 018.

Kosan Industries,
64-65, Laxmi Insurance Buildings,
Sir P.M. Road,
Bombay-400 007.

Kumardhubi Fireclay & Silica
Works Limited,
Chartered Bank Building,
4, Netaji Subhash Road,
Calcutta-700 001.

Kusum Products Limited,
9, Biplabi Trailakya Maharaj,
Sarani Barbourne Road,
Calcutta-700 001.

L.G. Balakrishnan & Brothers Limited,
India House,
Trichy Road,
Coimbatore-641 018.

L&T Gould Ltd.,
L&T House, Ballard Estate,
P.B. No. 278,
Bombay-400 038.

The Lagan Jute Machinery
Company Limited,
24-B, Park Street,
Calcutta-700 016.

Lakhanpal National Limited,
Makarpura, G.I.D.C.,
Baroda-390 010.

Lakme Limited,
Bombay House,
24, Homi Modi Street,
Bombay-400 023.

Lamco Lightings Arrester
Manufacturing Company Private
Limited,
B-39, Industrial Estate,
Sanatnagar,
Hyderabad-500 018.

Lanz Lab,
B-134, Vishnu Baug,
137, S.V. Road,
Andheri (West),
Bombay-400 058.

Larsen & Toubro Limited,
L&T House,
Ballard Estate,
P.B. No. 278,
Bombay-400 038.

Lathia Rubber Manufacturing
Company Pvt. Ltd.,
Sakinaka,
Kurla Andheri Road,
Bombay-400 072.

Lawkim Private Limited,
Chitalsar, Manpada,
S.V. Road, Thane-411 607.

Laxmi Machine Works Limited,
Perianaickenpalayam,
SRKV Post,
Coimbatore-641 020.

Laxsons Engineering & Electronics
Pvt. Limited,
Laxsons House,
Plot No. AA2, Walbhat Road,
Goregaon (East),
Bombay-400 063.

Lectrotek Systems (Pune)
Private Limited,
9, Kaka Halwai Industrial Estate,
Thane-411 009.

Lektrolab Equipments Company,
Todi Estate, 2nd Floor,
New Sunmill Compound,
Lower Parel, Bombay-400 013.

Li-Taka Laboratories
Private Limited,
103, Shivaji Nagar,
Pune-411 005.

Liberty Chemical Works,
Mogra Road,
Off. Nagardas Road,
Andheri (East), P.B. No. 8701,
Bombay-400 069.

Litex Electricals Pvt. Limited,
9/6, Dhiraj,
23, Duncan Causeway Road,
Bombay-400 022.

Logic Controls Private Limited,
B-160, Okhla Industrial Area,
Phase-I, New Delhi-110 020.

Lohia Machines Limited
(Lohia Research &
Development Centre),
C3, Panki Industrial Estate Area,
Kanpur-203 020.

Lona Industries Private Limited,
Alta Bhavan,
532, Senapati Bapat Marg,
Post Box No 17006, Dadar,
Bombay-400 028.

Lucas-TVS Limited,
180, Anna Salai,
Madras-600 006.

Lumax Industries Limited,
63-64, Gokhle Market,
Delhi-110 054.

Lupin Laboratories Private Limited,
159, C.S.T. Road, Kalina,
Santacruz (East),
Bombay-400 098.

Luxor Pen Company,
229, Okhla Industrial Estate,
Phase-III,
New Delhi-110 020.

Lyka Labs Private Limited,
4801/B & 4802/A,
G.I.D.C. Industrial Estate,
Ankleswar-393 002.

M. Krishnaswamy & Company,
C-35, Industrial Estate, Guindy,
Madras-600 032.

M.J. Institute of Research,
113, Jolly Makaer Chambers,
No. 2, 11th Floor,
Nariman Point,
Bombay-400 021.

M.P. Electricity Board
(R&D Cell) (Generation),
Korba Thermal Power Station,
Distt. Bilaspur,
Korba-495 681.

Machine Tools Aids and
Reconditioning (I) Ltd.,
18, Technocrats Industrial Estate,
Balanagar,
Hyderabad-500 037.

Machinery Manufacturing
Corporation Limited,
Gateway Building,
Appolo Bunder,
Bombay-400 039.

Macneill & Magor Limited,
4, Mangoe Lane,
Calcutta-700 070.

Madhav Capacitors Private Limited,
Bharat Coal Compound,
Bail Bazar, Kurla,
Bombay-400 070.

Madras Industrials Linings Limited,
425, Pantheon Road, Egmore,
Madras-600 008.

The Mafatlal Fine Spinning
Manufacturing Company Limited
(Textile Division),
Mafatlal Centre,
Nariman Point,
Post Box No. 10037,
Bombay-400 021.

Maharashtra Electronics
Corporation Limited,
(Strategic Development Division),
Raheja Centre, 13th Floor,
Nariman Point,
Bombay-400 021.

Maharashtra Electronics
Corporation Limited
(Telematics Division),
Raheja Centre, 13th Floor,
Nariman Point,
Bombay-400 021.

Maharashtra Electronics
Corporation Limited
Plot No. 214, 13th Floor,
Backbay Reclamation,
Raheja Centre, Nariman Point,
Bombay-400 021.

Maharashtra Hybrid Seeds
Company Limited,
16, Raj Mahal,
84, Veer Nariman Road,
Bombay-400 020.

Mahendra Hybrid Seeds Company
Private Limited,
Mahavir Marg,
Post Box 52,
Jalna-431 203.

Mahindra & Mahindra Limited,
Gateway Building,
Appolo Bunder,
Bombay-400 039.

Mahindra Engg. & Chemicals
Products Limited,
Gateway Building,
Appolo Bunder,
Bombay-400 039.

Mahindra Sintered Products
Limited,
Gateway Building,
Appolo Bunder,
Bombay-400 039.

Mahindra Ugine Steel Company
Limited,
Bakhtawar,
Nariman Point,
Bombay-400 021.

Maize Products
(Prop. Sayaji Mills),
P.O. Kathwada,
Ahmedabad-382 430.

Man-Made Textile Research
Association,
Near Market Telephone Exchange,
Ring Road, Surat-395 002.

Maschinenfabrik Polygraph (India)
Limited,
702/703, Regent Chambers,
7th Floor, Jamnalal Bajaj Road,
Nariman Point,
Bombay-400 021.

Marathe Engineering Industries,
Industrial Estate,
Plot No. 7 & 8,
Miraj-416 410,
(Maharashtra).

Marathe Research Foundation,
Main Building,
Shri Govindraoji Marathe Road,
Miraj-416 410,
(Maharashtra).

Marecon Limited,
12, Malviya Avenue,
Tiruvanmiyur,
Madras-600 041.

Meridian Pharmaceuticals
Private Limited,
14/15, Old Trunk Road,
Pallavaram,
Madras-600 043.

Marine & Communications
(India) Limited,
A.P.I.E., Autonagar,
Visakhapatnam-530 012,
(Andhra Pradesh).

Matri Instruments & Chemicals
Private Limited,
Vishwakarma Complex,
B-3/4, Industrial Estate,
Mettupalayam,
Pondicherry-605 009.

Mawana Sugar Works,
DCM Limited,
Bara Hindu Rao,
Delhi-110 006.

Max India Limited,
12th Floor, Devika Tower,
6, Nehru Place,
New Delhi-110 019.

May & Baker (India) Limited,
Maybaker House, Worli,
Bombay-400 025.

Mc Dowell & Company Limited,
3, Second Line Beach,
Post Box No. 36,
Madras-600 001.

MCE Products Sales Services Private
Limited,
37, Okhla Industrial Estate,
New Delhi-110 020.

Measurement Systems Private
Limited,
66, IV Main Road,
Industrial Town,
Rajaji Road,
Bangalore-560 044.

Medley Laboratories Private Limited,
"Medley House", Plot No. D2,
16th Road, MIDC Area,
Andheri (E),
Bombay-400 093.

Meltron Semiconductors Limited,
214, Raheja Centre, 13th Floor,
Nariman Point,
Free Press Journal Road,
Bombay-400 039.

Merind Limited,
New India Centre,
17, Cooperage Road,
Bombay-400 039.

Metal Box India Limited,
Barlow House,
59C, Chowringhee Road,
Calcutta-700 020.

The Metal Powder Company Limited,
Chairman A. Shanmuga Nagar,
6-E, Velayutham Road,
Sivakasi-626 123.

Metallazing Equipment Company
Pvt. Ltd.,
5th Chopasni Road,
Jodhpur-342 003.

Metallurgical & Engineering
Consultants (India) Limited,
'Mecon Office', Doranda,
Ranchi-834 002.

Metazinc Private Limited,
Sunayana,
9, S.V. Road,
Vile Parle (West),
Bombay-400 056.

Mehta Pharmaceuticals Private
Limited,
G.T. Road, Chheharata,
Amritsar-143 105, (Punjab).

Metkem Silicon Limited,
Post Box No. 20/26,
4, Second Line Beach,
Madras-600 001.

Metroark Private Limited,
33A, J.L. Nehru Road, 20th Floor,
Calcutta-700 071.

Metroni Drugs Private Limited,
E-21, MIDC Industrial Estate,
Tarapur-401 506.

The Mettur Chemical and
Industrial Corporation Limited,
Mettur Dam R.S.-636 402,
Salem District, (Tamil Nadu).

Micronics Corporation,
Maniktala Colony,
Makhla-712 245,
Distt. Hooghly,
West Bengal.

Micropack Limited,
47, Developed Plot for
Electricals & Electronics Industries,
Perungudi,
Madras-600 096.

Mikrotech,
89A/17, Hadapsar Industrial
Estate,
Pune-411 013.

Miles India Limited,
598, Sayajipura Ajwa Road,
Baroda-390 019.

Mine Safety Appliances Limited,
P-25, Transport Depot Road,
Calcutta-700 088.

Mitronics Corporation,
9/10, Vakeel Industrial Estate,
Valbhat Road,
Bombay-400 063.

Modern Insulators Limited,
D-22, Moti Dungri Road,
Jaipur-302 004,
(Rajasthan).

Modern Malleable Casting Works,
53-B, IVth Floor,
Mirza Ghalib Street,
Calcutta-700 016.

Modi Arc Electrodes Company
(Prop. Modi Industries Limited),
Modi Nagar-201 204,
Distt. Ghaziabad, (U.P.).

Modi Paint & Varnish Works
(Prop. Modi Industries Limited),
Modi Nagar-201 204,
Distt. Ghaziabad, (U.P.).

Modi Rubber Limited,
Modi Nagar-201 204,
Distt. Ghaziabad, (U.P.).

Modi Xerox Limited,
Modipuram,
Meerut-250 110, (U.P.).

Modipon Limited,
Modi Nagar-201 204,
Distt. Ghaziabad, (U.P.).

Modison Metal Refiners,
33, Nariman Bhawan,
227, Nariman Point,
Bombay-400 021.

Molins of India Limited,
12, Biren Roy Road (West),
Behala, Calcutta-700 034.

Monica Electronics
Private Limited,
GA-2, B-1 Extension,
Mohan Cooperative Industrial
Estate,
Sher Shah Suri Marg, Badarpur,
New Delhi-110 044.

Monotype India Limited,
Regent House,
12, Govt. Place East,
Calcutta-700 069.

Morani Chemicals Private Limited,
MIDC Plot No. 4,
Kalyan Bhivandi Road,
Vill. Sarvali, Dist. Thane,
Maharashtra.

The Morarji Gokuldas Spinning &
Weaving Mills Limited,
Unit No. II,
Dr. Ambedkar Road,
Parel, Bombay-400 012.

Morris Electronics Limited,
Bhosari Industrial Estate,
Pune-411 026.

Motor Industries Co. Limited,
Post Box No. 3000,
Bangalore-560 030.

Motwane Manufacturing
Company Pvt. Ltd.,
Gyan Ghar, Plot No. 343-A,
14th Road, Khar,
Bombay-400 052.

Motwane Private Limited,
127, Mahatma Gandhi Road,
Post Box No. 1312,
Bombay-400 023.

MRF Limited,
Tarapore Towers,
826, Anna Road,
Madras-600 002.

Mukund Iron & Steel Works
Limited,
Lal Bahadur Shastri Marg,
Kurla, Bombay-400 070.

Multimetals Limited,
Heavy Industrial Area,
Kansua Road,
Kota-324 003.

Murphy India Limited,
Ceat Mahal,
463, Annie Besant Road,
Worli, Bombay-400 025.

The Mysore Kirloskar Limited,
P.O. Yantrapur,
Harihar-577 602,
(Karnataka).

Mysore Snack Foods Limited,
No. 19, Platform Road,
Bangalore-560 023.

Mytimasters' Engineering Private
Limited,
79, Guru Nanak Road,
Bandra, Bombay-400 050.

Nandi Chemicals Private Limited,
Jamboti Road, Kuttalwadi,
P.O. Navage,
Belgaum-590 014,
(Karnataka).

Narne Tulaman Manufacturers
Private Limited,
Bala Nagar Township,
Hyderabad-500 037.

National Dairy Development Board,
Anand-388 001,
(Gujarat).

The National Engineering
Company (M) Pvt. Ltd.,
Kakani Towers,
Post Box No. 4534, Nack Street,
15, Kader Nawaz Khan Road,
Madras-600 006.

The National Fireworks Factory,
74/1, Police Station Road,
Post Box No. 13,
Sivakasi-626 123,
(Tamil Nadu).

National Information Technologies
Limited,
153, Zone I,
Maharana Pratap Nagar,
Bhopal-462 011.

The National Insulated Cable
Company Of India Limited,
'Nikko House',
2nd Hare Street,
Calcutta-700 001.

National Organic Chemical Industries
Limited,
Mafatlal Centre,
Nariman Point,
Bombay-400 021.

National Peroxide Limited,
Neville House,
J.N. Heredia Marg,
Ballard Estate,
Bombay-400 038.

The National Radio &
Electronics Co. Ltd.,
Mahakali Caves Road,
Chakala, Andheri (East),
Bombay-400 093.

The National Rayon Corporation
Limited,
P.B. No. 11118,
Eros Theatre Building,
1, Jamshedji Tata Road,
Bombay-400 020.

Navdeep Chemicals Private Limited,
166, Bora Bazar Street,
Fort, Bombay-400 023.

Navin Flourine Industries
(Chemical Divn. of Mafatlal),
Mafatlal Centre,
Nariman Point,
Bombay-400 021.

New Shorrock Mills
(Divn. of Mafatlal Ind. Ltd.),
Asarwa Road,
Post Box No. 2006,
Ahmedabad-380 016.

New Tobacco Company Limited,
1 & 2 Old Court House Corner,
Calcutta-700 001.

NGEF Limited,
Old Madras Road,
Post Box No. 3876,
P.O. Byappanahalli,
Bangalore-560 038.

Nirlon Synthetic Fibres
& Chemicals Ltd.,
Nirlon House,
254, B, Dr. Annie Besant Road,
Worli, Bombay-400 025.

Nirup Synchro Ltd.,
1-2-593/39 Gagan Mahal Colony,
Hyderabad-500 029,
(Andhra Pradesh).

Nissan Springs Pvt. Ltd.,
1700 Napier Town,
Jabalpur-482 001.

Niston Laboratories,
1003, Raheja Centre,
214 Nariman Point,
Bombay-400 021.

Nitin Castings Ltd.,
81-85 Mittal Tower,
A Wing, 8th Floor,
Nariman Point,
Bombay-400 021.

Nivedita Chemicals Pvt. Ltd.,
A-14 MIDC,
Andheri (East),
Bombay-400 093.

Nivo Controls Pvt. Ltd.,
14-B, Ratlam Kothi,
Manchan Bagh Road,
Indore-452 001.

Northern Minerals Pvt. Ltd.,
Rajendra Mansion,
19-A, Ansari Road,
Darya Ganj,
New Delhi-110 002.

Nuchem Plastics Limited,
20/6, Mathura Road,
Faridabad-121 006,
(Haryana).

O/E/N India Limited,
P.B. No. 2 Vytila,
Cochin-682 019.

Oblum Electrical Industries
Pvt. Ltd.,
A-16 & 17, Assisted Pvt. Ltd.,
Balanagar, Hyderabad-500 037.

OMC Computers Ltd.,
5th Floor, Chenoy Trade Centre,
116 Parkland,
Secunderabad-500 003,
(Andhra Pradesh).

Organic Coatings Pvt. Ltd.,
Moon Light 27,
Gundavali Naka,
Kurla Road, Andheri (East),
Bombay-400 069.

Organon Research Centre,
38, Chowringhee Road,
Calcutta-700 071.

Orient Paper Mills,
P.O. Brajraj Nagar,
Distt. Sambhalpur,
(Orissa).

Oriental Chemical Works (P) Ltd.,
1/1B, Gobinda Addy Road,
Chetla, Calcutta-700 027.

The Oriental Science Apparatus
Workshops,
J.L. Nehru Marg,
Ambala Cantt.-133 001,
(Haryana).

Orissa Cement Limited,
P.O. Rajgangpur-770 017,
Distt. Sundergarh,
(Orissa).

Orissa Industries Ltd.,
P.O. Barrang, Cuttack,
(Orissa).

The Orissa State Electronics
Development Corp'n. Ltd.,
361 Sahidnagar,
Bhubaneswar-751 007,
(Orissa).

Orson Electronics Ltd.,
209/210 "Arcadia",
Backbay Reclamation,
Nariman Point,
Bombay-400 021.

Otis Elevator Co. (India) Ltd.,
Gateway Building,
Apollo Bunder,
Bombay-400 039.

Otoklin Plants & Equipments Ltd.,
1006 Prasad Chambers,
Bombay-400 004.

Oxide (India) Private Limited,
D-176, Shastri Avenue,
P.O. Bidhan Nagar,
Dist. Burdwan (W.B.),
Durgapur-713 212.

P.J. Chemicals Ltd.,
Plot 12 & 13 Industrial Dev Area,
Phase-II, Patancheru-502 320,
Distt. Medak,
(Andhra Pradesh).

P.S. Industrials,
53 N.P. Development Plot for
Industrial Estate,
Ekkattuthangal,
Madras-600 097.

Paharpur Cooling Towers (P) Ltd.,
Paharpur House,
8/1/B Diamond Harbour Road,
Calcutta-700 027.

The Paper Products Limited,
13-14, Ajmeri Gate Extn.,
Asaf Ali Road,
New Delhi-110 002.

Paramount Conductors Ltd., 32 MIDC Industrial Area, Nagpur-440 028.	PDI Chemicals Pvt. Ltd., Ram Krishna Mandir Road, Off. M. Vasanji, Andheri (East), Bombay-400 059.	Petrochemical Engineering Co. Pvt. Ltd., 1506-7, Chiranjiv Towers, 43, Nehru Place, New Delhi-110 019.
Paramount Pollution Control Corpn., 4 Vrajwadi Jetalpur Road, Baroda-390 005.	Peico Electronics & Electricals Limited, 7, Justice Chandra Madhav Road, Calcutta-700 020.	Petrofils Co-Operative Limited, P.O. Petrofils, Distt. Vadodara, PIN-391 347.
Paramount Pollution Control Pvt. Ltd., 76, Viswas Colony, Alkapur, Baroda-390 005.	Pennwalt India Ltd., 507 Kakad Chambers, 132 Dr. Annie Besant Road, Worli, Bombay-400 018.	Pfizer Limited, Express Towers, Nariman Point, Bombay-400 021.
Paramount Sinters Pvt. Ltd., 9 Pukharaj Laxmi Nagar, Nagpur-400 022.	Perfect Engineering Products Private Limited, Mehtar House, 15, Cawasji Patel Street, Bombay-400 001.	Philips Carbon Black Limited, 31, Netaji Subhash Road, Post Box No. 2229, Calcutta-700 001.
Parishudh Sadhan Yantra Pvt. Ltd., C-40/1 Industrial Area, Meerut Road, Ghaziabad-201 203.	Perfect Sealing Systems (P) Limited, 43/2, Erandawana, Off. Karve Road, Pune-411 038.	Photophone Limited, 7, Saki Vihar Road, Post Box No. 8936, Bombay-400 072.
Parkhe Research Institute, 1183 Shivaji Nagar., Fergusson College Road, Pune-411 005.	Permali Wallace Limited, Central India Floor Mills Estate, Hoshangabad Road, Post Box No. 38, Bhopal-462 020.	Pibco Limited, Punj House, M-13, Connaught Circus, New Delhi-110 001.
Partap Steel Rolling Mills (1935) Ltd., Pratap Estate, Chheharta-143 105, (Punjab).	Permanent Magnets Limited, Sylvester Building, 2nd Floor, 20, Shahid Bhagat Singh Road, Opp. Old Custom House, Bombay-400 023.	Pioneer Seed Company Limited, A-308-311, Ansal Chambers-I, 3, Bhikaji Cama Place, New Delhi-110 066.
The Parvara Sahkari Sakhar Karkhana Ltd., Paravara Nagar, Tal. Shriram Pur, Distt. Ahmednagar, (Maharashtra).	Pest Control (India) Private Limited, Yusuf Building, M.G. Road, Post Box No. 1510, Bombay-400 023.	Planned Pharma Pvt. Ltd., Neelam 80, Marine Drive, Bombay-400 002.
Patheja Forgings Auto Parts Manufacturers Ltd., E-20, MIDC, Bhosari, Pune-411 026.	Pesticides India (Prop. Mewar Oil & Gen. Mills Ltd.), Udai Sagar Road, Post Box No. 20, Udaipur-313 001.	Plastipeel Chemicals and Plastics (P) Ltd., Plot No. 20, N.S. Road No. 9 JVD Scheme, Bombay-400 020.
Patwa Kinarivala Electronics, C-29/2A, Sardar Industrial Estate, Ajwa Road, Baroda-390 019.	Petrocarbon & Chemcials Co., Modi Building, 27, Sir R.N. Mukherjee Road, Calcutta-700 001.	PMT Machine Tool Automatics Private Limited, Bell Building, 1st Floor, Sir Phirozshah Mehta Road, Fort, Bombay-400 001.
PBJ-Industrial Electronics Pvt. Ltd., 19/21 Ambalal Doshi Marg, Fort, Bombay-400 023.		Polychem Limited, 9, Jamshedji Tata Road, Churchgate Reclamation, Bombay-400 020.

Polyolefine Industries Limited,
Mafatlal Centre,
Nariman Point,
Bombay-400 021.

Polypharm Private Limited,
Calcot House,
8, Tamrind Street, Fort,
Bombay-400 023.

Ponds' (India) Limited,
26, Commander-in-Chief Road,
Madras-600 105.

Ponni Sugars & Chemicals Limited,
1st Floor,
109, Nungambakkam High Road,
Madras-600 034.

Power Build Limited,
Post Box No. 28,
Vitthal Udyognagar,
Vallabh Vidyanagar,
Kheda-388 121.

Pragati Computers,
Pragati House,
26, Victoria Nagar,
Pondicherry-605 005.

Pratap Rajasthan Copper Foils
& Laminates Limited,
12/6, National Highway II,
Vishwakarma Industrial Area,
Jaipur-302 013.

Pratap Steel Rolling Mills
Pvt. Ltd.,
A/4, Kalindi,
New Delhi-110 065.

Prav Electrosark
Private Limited,
'Electra House',
691/A-A, Pune-Satara Road,
Pune-411 037.

Precision Fasteners Limited,
New India Centre,
17, Cooperage Road,
Bombay-400 039.

Precision Tools & Castings
Pvt. Limited,
Malviya Nagar, Aishbagh,
Lucknow-226 004.

The Premier Automobile Limited,
92/93, Maker Towers 'F',
G.D. Somani Marg,
Cuffe Parade, Colaba,
Bombay-400 005.

The Premier Cable Co. Ltd.,
Premier Cable House,
P.B. No. 1849 M.G. Road,
Ernakulam.

Premier Instruments & Controls
Limited,
P.B. No. 6331,
339-A, Avanashi Road,
Perianaickenpalayam,
Coimbatore-641 037.

Premier Polytronics Limited,
Premier House,
185, ATD Street,
Race Course,
Coimbatore-641 018.

Primatex Machinery Private
Limited,
Dhanraj Mahal, 2nd Floor,
Chhatrapati Shivaji Maharaj Marg,
Bombay-400 039.

Process & Products
Development Centre,
Foundry Nagar,
Agra-282 006.

Processors Systems (India) Limited,
'Nauka' Azad Road, Kaloar,
Cochin-682 017.

Professional Electronic Products,
Opp. Old Octroi Post,
Delhi Road, P.O. Box 316,
Meerut-250 002.

PSI Data Systems Limited,
2, Victoria Road,
Bangalore-560 047.

PSL Engineering Private Limited,
10/1, Okhla Industrial Area,
Phase II, New Delhi-110 020.

Pudumjee Pulp & Paper Mills Ltd.,
Thergaon, Chinchwad,
Pune-411 033.

Pulp & Paper Research Institute,
Jaykaypur-765 017,
Distt. Koraput, (Orissa).

Punjab Anand Batteries Ltd.,
A-9 & 10 Industrial Estate,
SAS Nagar-160 051,
Mohali, Punjab.

Punjab Communications Ltd.,
C-135 Phase VIII,
Industrial Focal Point,
Post Box No. 3,
SAS Nagar-160 059,
Mohali, Punjab.

Punjab Power Packs Ltd.,
B-98 Phase VIII, SAS Nagar,
Mohali, Punjab.

Punjab Recorders Ltd.,
B-99 Phase VIII,
SAS Nagar-160 059,
Near Chandigarh,
(Punjab).

Punjab Research Institute,
Industrial Area,
Rajpura-140 401,
(Punjab).

Punjab State Hosiery & Knitwear
Development Corporation Limited
SCO-54-55-56, PSIDC Building,
4th Floor, Sector-17,
Chandigarh.

Punjab Tractors Ltd.,
Phase-IV, SAS Nagar,
Distt. Ropar,
Near Chandigarh-160 051,
Punjab.

Punjab Wireless Systems Ltd.,
B-53 Phase IV,
SAS Nagar (Mohali),
Near Chandigarh-160 055.

Purolator India Ltd.,
1, Shri Aurobindo Marg,
New Delhi-110 016.

Pycom Industries,
D-4 Udyog Sadan,
No. 3 MIDC, Marol,
Andheri (East),
Bombay-400 093.

Pyrotech International,
F-16 Road No. 3,
Mewar Industrial Area,
Udaipur-313 001,
(Rajasthan).

R.G. Ispat Limited,
118-120 Road No. 9,
Vishwakarma Industrial Area,
Jaipur-302 013.

Rainbow Ink & Varnish
Mfg. Co. Pvt. Ltd.,
133-C Vakola,
Santacruz (East),
Bombay-400 055.

Raj Prakash Chemicals Ltd.,
114 Mittal Chambers,
Nariman Point,
Bombay-400 021.

Rajamane Teletric Pvt. Ltd.,
3, Mahadevapura Post,
Bangalore-560 048.

Rajasthan Communications Ltd.,
3, Kanakpura Industrial Area,
Kanakpura,
Jaipur-302 012,
(Rajasthan).

Rajasthan Electronics and
Instruments Ltd.,
2 Kanakpura Industrial Area,
Sirsi Road, Jaipur-302 012,
(Rajasthan)

Rallis India Limited
(Pharmaceutical & Chemical Division).
Rallis House, 21 D.S.Marg,
Bombay-400 001.

Rallis India Ltd.
(Agrochemicals Division),
21 D.S. Marg,
Bombay-400 001.

The Raymond Woollen Mills Ltd.,
J.K. Building,
N. Morarji Marg,
Ballard Estate,
Bombay-400 038.

RCA Pharma Lab.,
Agarwal Estate,
168 Vidyanagri Marg,
Kalina Santacruz (East),
Bombay-400 098.

Reckitt & Coleman of India Ltd.,
41 Chowringhee Road,
Calcutta-700 071.

Recondo Limited,
S.K. Ahira Marg,
Worli, Bombay-400 025.

Recorders & Medicare Systems,
181/5 Industrial Area, Phase I,
Chandigarh-160 002.

Reliance Cellulose Products Limited,
1-8-58/6/8, Srinidhi Complex,
3rd Floor, Sarojini Devi Road,
Secunderabad-500 003.

Reliance Industries Ltd.,
3rd Floor, Maker Chamber IV,
222 Nariman Road,
Bombay-400 021.

Reliance Silicons (I) Ltd.,
95 Mittal Towers 'B',
210 Nariman Point,
Bombay-400 021.

Renewable Energy Systems
Private Limited,
10-3-3 A, East Marredpally,
Secunderabad-500 026.

Research Institute for Graphic Arts,
311 Gagandeep Building,
Rajindra Place,
New Delhi-110 008.

Resins Plastics Pvt. Ltd.,
71 & 75 Wing-C,
Mittal Tower, 7th Floor,
Nariman Point,
Bombay-400 021.

Resources Development Instt.,
1100 Quarters Area,
Bhopal-462 016.

Richardson Hindustan Limited,
Tiecicon House,
Dr. E. Moses Road,
Bombay-400 011.

Rinki Research & Development
Centre,
Opp : Bombay Shopping Centre,
R.C. Dutt Road, Alkapuri,
Baroda-390 005.

Rishiroop Polymers Pvt. Ltd.,
65 Atlanta, Nariman Point,
Bombay-400 021.

Roche Products Limited,
28 Pt. M.M. Malviya Road,
Bombay-400 034.

Rockweld Electrodes India Ltd.,
29 Industrial Estate, Ambattur,
Madras-600 058.

Rohit Pulp & Paper Mills Ltd.,
Rohit Chambers,
Chough Street,
Bombay-400 001.

Roop Ultrasonix Private Limited,
25-Annie Besant Street,
Santacruz (West),
Bombay-400 054.

Roplas (India) Ltd.,
145 Bombay-Pune Road, Pimpri,
Pune-411 018.

Rosalee Paints Pvt. Ltd.,
C-1/1-2-3, GIDC Estate,
Vallabh Vidya Nagar-388 120,
(Gujarat).

Roussel Pharmaceuticals (I) Ltd.,
D. Shivsagar,
Dr. Annie Besant Road, Worli,
Bombay-400 018.

The Rubber Products Pvt. Ltd.,
Plot C-44, Road No. 28,
Wagle Industrial Estate,
Thane-400 604.

Ruston & Hornsby (India) Ltd.,
1 Dr. V.B. Gandhi Marg,
Bombay-400 023.

S.A.J. Froude Test Plant Pvt. Ltd.,
12 Kaka Halwai Industrial Estate,
Pune-Satara Road,
Pune-411 009.

S.D. Fine Chem Pvt. Ltd.,
315-317 T.U. Industrial Estate,
248 Worli Road,
P.B. No. 19160,
Bombay-400 025.

S.J. Kelkar & Co Ltd.,
Devkaran Mansion,
36 Mangal Das Road,
Bombay-400 002.

S.T.P. Limited,
8 Camac Street,
Calcutta-700 017.

Sadhana Nitro Chem Ltd.,
IBI House, 1st Floor,
S-86 Andheri-Kurla Road,
Near Marol Naka,
Bombay-400 059.

Sahyadri Dyestuffs & Chemicals
(Div. of Deepak Nitrite Ltd.),
9/10 Kunj Society, Alkapuri,
Baroda-390 005.

Sakthi Sugars Limited,
180 Race Course Road,
Post Box No. 3775,
Coimbatore-641 018.

San Engg. & Locomotive Co. Ltd.,
P.B. No. 4802 Whitefield Road,
Bangalore-560 048.

Sandoz (India) Ltd.,
Snadoz House,
Dr. Annie Besant Road, Worli,
Bombay-400 018.

Sandvik Asia Limited,
Bombay-Pune Road,
Pune-411 012.

Sangeet Research Academy,
1 Netaji Subhash Chandra
Bose Road,
Tollyganj,
Calcutta-700 040.

Sarabhai Electronics Ltd.
(Org Systems Division),
Wadi Wadi, Baroda-390 007.

Sardar Patel Renewable Energy
Research Instt.,
Vallabh Vidyanagar,
Kheda-388 120,
(Gujarat).

Satelec Power Electronics
Private Limited,
3953/29, Regharpura,
Karol Bagh, New Delhi-110 005.

Satyadev Chemicals Ltd.,
P.B. No. 101 Pratap Nagar Road,
Vadodara-390 004.

Savita Chemicals Pvt. Limited,
66/67, Nariman Bhavan,
6th Floor, Nariman Point,
Bombay-400 021.

School of Applied Research,
Plot No D-25, MIDC Area,
Miraj-416 410.

The Scientific Instruments
Co. Ltd.,
6 Tej Bahadur Sapru Road,
Allahabad-211 001.

Scientific Mes-Technik Pvt. Ltd.,
59 Saket, Indore-452 001.

Sealol Hindustan Limited,
Hadapsar 212/2,
Pune-411 028.

Searle (India) Limited,
21 D. Sukhadwala Marg,
Post Box No. 233,
Bombay-400 001.

Secals Limited,
8 Rutland Gate, P.B. No. 458,
Madras-600 006.

Sekhsaria Chemicals Pvt. Ltd.,
11-A Mittal Chamber,
Nariman Point,
Bombay-400 021.

Selectro,
30/4, Phase III,
GIDC Industrial Area, Naroda,
Ahmedabad-382 330.

Semiconductor Complex Ltd.,
Phase VIII,
SAS Nagar-160 059,
(Punjab).

Semiconductors Limited,
Ador House,
6 K Dubash Marg, Fort,
Bombay-400 023.

Semitronik Instruments,
17 Archana Industrial Estate,
Rakhial, Ahmedabad-380 023.

Seshasayee Paper & Boards Ltd.,
Pillipalayam Cauvery RS P.O.,
Erode-638 007,
(Tamil Nadu).

Seshasayee Industries Limited,
Vadalur-603 303,
South Arcot Dists.,
(Tamil Nadu).

Shalimar Paints Ltd.,
13 Camac Street,
Calcutta-700 017.

Shanti Electric Instruments,
Green House, 1st Floor,
Green Road, Fort,
Bombay-400 023.

Sharma Chemical Consultancy
Services,
77 Bazullah Road, T Nagar,
Madras-600 017.

Shasun Chemicals (Madras) Pvt. Ltd.
13 Nageshwar Rao Road,
T. Nagar, Madras-600 017.

Shaw Wallace & Co. Limited,
No. 4, Bankshall Street,
Calcutta-700 001.

Shaw Wallace Gelatins Limited,
No. 4, Bankshall Street,
Calcutta-700 001.

Shimo Resins Private Limited,
S-99 MIDC, Bhosari,
Pune-411 026.

Shree Synthetics Ltd.,
Naulakhi, Malsi Road,
Ujjain-456 001, (M.P.).

Shri Dinesh Mills Ltd.,
Post Bag No. 65,
Padra Road, P.B. No. 65,
Baroda-390 005.

Shri Ram Food &
Fertilizers Industries
(A Unit of DCM Ltd.),
Shivaji Marg,
P.B. No. 6219,
Delhi-110 015.

Shriram Fibres Limited,
Express Building,
9-10 Bahadur Shah Zafar Marg,
New Delhi-110 002.

Shriram Institute for
Industrial Research,
19 University Road,
Post Box No. 2122,
Delhi-110 007.

Shriram Refrigeration
Industries Ltd.,
19 Kasturba Gandhi Marg,
New Delhi-110 001.

Shroffs Technical Services
Pvt. Limited,
Excel Estate, S.V. Road,
Goregaon (West),
Bombay-400 062.

Shukla-Manseta Industries
Pvt. Ltd.,
24-B, Ambalal Doshi Street,
Fort,
Bombay-400 023.

Shyam Antenna Electronics Pvt. Ltd.,
A-4 'C' Block,
Community Centre,
Naraina Vihar,
New Delhi-110 028.

Siemens India Ltd.,
134/A, Dr. Annie Besant Road,
Worli, Bombay-400 018.

Sietex Control (P) Limited,
121/1 Neelangarai,
Thirvanmiyur,
Madras-600 041.

The Simbhaoli Sugar Mills Ltd.,
P.O. Simbhaoli Pin-245 207
Distt. Ghaziabad, (U.P.).

Simco Engineering Ltd.,
16-17 College Road,
Madras-600 006.

Simpson & Co. Ltd.,
861/862 Anna Salai,
Madras-600 002.

Siris Limited
(Formerly : South India Res. Instt.
(Hyderabad) Ltd.),
L.B. Nagar,
Hyderabad-500 563.

The Sirpur Paper Mills Limited,
5-9-201/2 & 2A, Chirag Ali Lane,
Hyderabad-500 001.

Sivananda Electronics,
Deepak Mahal Lam Road,
Deolali-422 401,
(Maharashtra).

Somaiya Organics (India) Ltd.,
P.O. Somaiya Nagar,
Barabanki-225 123,
(U.P.).

Sonodyne Electronics Co. Pvt. Ltd.,
98 N.B. Block-E,
New Alipore Road,
Calcutta-700 053.

Sonodyne Television Co. Pvt. Ltd.,
98 N.B. Block-E,
New Alipore Road,
Calcutta-700 053.

Soumag Electronics Limited,
75/75-A, First Avenue,
Indira Nagar, Adyar,
Madras-600 020.

South India Research
Institute Pvt. Ltd.,
Sirinagar,
Vijayawada-520 007,
(Andhra Pradesh).

Southern Electronics (Bangalore)
Pvt. Ltd.,
16-A Peenya Industrial Area,
Phase-I, Peenya,
Bangalore-560 058.

Southern Magnetics Pvt Ltd.,
11-3, Dr. Vikram Sarabhai
Electronic Estate,
Thirvanmiyur,
Madras-600 041.

Southern Petrochemical Industries
Corpn. Ltd.,
39 Armenian Street,
Madras-600 001.

Spaco Carburattors (India) Ltd.,
901 Prasad Chambers,
Opera House,
Bombay-400 004.

Span Research Centre,
175 New Industrial Estate,
Road No. 6-F, Udyog Nagar,
Udhna-394 210, Surat.

Spire India,
Dudhia Industrial Estate,
Dahisar (East),
Bombay-400 068.

Sri Kannapiran Mills Ltd.,
Post Bag No. 1,
Sowripalayam Road,
Coimbatore-641 028.

Standard Alkali-Chem Division
Standard Mills Co. Ltd.,
Mafatlal Centre,
Nariman Point, P.B. No. 1051,
Bombay-400 021.

The Standard Batteries Limited,
Vakola, Santacruz,
Bombay-400 055.

Standard Clutches & Spare,
Village Sarmal,
Post Vashend-421 604,
Taluka Shahpur,
Distt. Thane.

The Standard Mills Co. Ltd. (Textile Division), Mafatlal Centre, Nariman Point, P.B. No. 1051, Bombay-400 021.	Stumpp, Scheule & Somappa Ltd. (Electronics Division), 139/2 Hosur Road, Bangalore-560 034.	Suparna Chemicals Private Limited, 54-A, Mittal Tower, 5th Floor, 'A' Block, Nariman Point, Bombay-400 021.
Standard Motor Products of India Ltd., 134 Anna Road, Post Box No. 2210, Madras-600 002.	Sudarshan Aluminium Industries Limited, 26, Nariman Bhawan, 227 Nariman Point, Bombay-400 021.	Super Parts Pvt. Ltd., E-42/3 Okhla Industrial Area, Phase-II, New Delhi-110 020.
Standard Organic Ltd., Sphire Building, 5-9588/2 Faytech Maidan, Hyderabad-500 001.	Sudarshan Chemicals Industries Ltd., 162 Wellesley Road, Sangam Bridge, Pune-411 001.	Super Seal India Pvt. Ltd., 1213 Kailash, K.G. Marg, New Delhi-110 001.
Standard Pharmaceuticals Ltd. (A Div. of ASE), Wadi Wadi, Baroda-390 007.	Sukriti Vidyut Udyog Private Limited, D-39, Industrial Area III, Meerut Road, Ghaziabad-201 003.	Superceram, 11-A First Floor, 8th Main, 19th Cross Malleswaram, Bangalore-560 055.
Standard Research Centre, 1-11-200 Begumpet, Hyderabad-500 016.	Sum Electronics, 127 Atlanda, Nariman Point, Bombay-400 021.	Suvik Electronics Pvt. Ltd., Nowroji Vakil Compound, Shahibag, Ahmedabad-380 004.
Star Electronics & Holdings Pvt. Ltd., Dhanraj Mahal, Ch. Shivaji Maharaj Marg, Bombay-400 039.	Sumac International Pvt. Ltd., A-61 Talkatora Industrial Estate, Lucknow-226 011.	Swadesh Polytex Limited, Kavi Nagar Industrial Area, Ghaziabad-201 021, (U.P.).
Star Industrial & Textile Enterprises Ltd., Dhanraj Mahal, Chhatrapati Shivaji Marg, Bombay-400 039.	Sundaram Clayton Limited, Jayalakshmi Estate, 8 Haddows Road, Madras-600 006.	Swaraj Mazda Limited, SCO 156-160, Sector 8-C, Madhya Marg, Chandigarh-160 008.
Steel Tubes of India Ltd., Steel Tube Road, Dewas-455 001, (M.P.).	Sundaram Fastners Limited, 180 Mount Road, Madras-600 006.	Swathy Chemicals Private Limited, 66, Mount Poonamallee Road, Manapakka Village, Madras-600 089.
Steelcast Bhavnagar Pvt. Ltd., Ruvapari Road, Bhavnagar-364 001, (Gujarat).	Sundaram Industries Limited, TVS Building, West Veli Street, Madurai-625 001.	Synbiotics Ltd., P.B. No. 129, Wadi Wadi, Baroda-390 007.
Steelsworth Pvt. Limited, 17 Ganesh Chandra Avenue, Calcutta-700 013.	Suneeta Laboratories (P) Ltd., 89-B/90 Industrial Estate, Pologround, Indore-452 003.	Synthetics & Chemicals Ltd., 7 Jamshedji Tata Road, Post Bag No. 11486, Bombay-400 020.
Structural Designers & Consultants Private Limited, 1008/9, Raheja Centre, Nariman Point, Bombay-400 021.	Sunil Synchem Limited, 17/18 Old Industrial Area, Alwar-301 001, (Rajasthan).	Synthetics & Polymer Ind., 77 G V M S Audyogic Vasahat Ltd., Odhav-382 410, (Gujarat).

Synthite Industrial Chemicals Pvt. Ltd.,
Synthite Velly Kadayiruppu,
P.O. Kolenchery-682 311,
Distt. Ernakulam,
(Kerala).

Systech Private Ltd.,
Ushashree,
124-C Erandavna,
Near Kamla Nehru Park,
Pune-411 004.

Systems Dimensions Pvt. Ltd.,
Plot No. 17-A,
Kumbalgodu Industrial Area,
Phase-I, Bangalore-560 074.

Systems Research Institute,
17-A Gultekdi,
Pune-411 037.

Samtel (India) Limited,
50-51, Community Centre,
New Friends Colony,
New Delhi-110 065.

T.T.K. Pharma Pvt. Ltd.,
6 Cathedral Road,
Madras-600 086.

Tablets (India) Limited,
179 T.H. Road,
Madras-600 081,
(Tamil Nadu).

Tag Corporation,
56 Thiruneermalai Road,
Chrompet P.O.,
Madras-600 044,
(Tamil Nadu).

Talbro's Automotive Components Limited,
13-D Sagar Apartments,
6 Tilak Marg, New Delhi-110 001.

Tamil Nadu Electricity Board,
NPKRR Maaligai, 3rd Floor,
791 Anna Salai, West Wing,
Madras-600 002.

Tamilnadu Dadha Pharmaceuticals Ltd.,
260-262 Royapetha High Road,
Madras-600 014.

Tan India Ltd.,
Post Box No. 191,
No. 21, Gandhipuram Main Road,
Komarappalayam-638 183,
(Tamil Nadu).

Tandem Electronics and Services Ltd.,
11-7 Instronics Campus,
Thiruvanniyur,
Madras-600 041.

Taru Lalvani Chemicals Pvt. Ltd.,
Kamanwala Chambers,
Sir P.M. Mehta Road,
Bombay-400 001.

Tata Chemicals Ltd.,
Bombay House,
24 Homi Modi Street,
Bombay-400 001.

Tata Exports Ltd.
(Leather Division),
Block-A, Shiv Sagar Estate,
Dr. Annie Besant Road, Worli,
Bombay-400 018.

Tata Electric Companies
The Tata Hydro Electric Power Supply Company Ltd.,
24, Homi Modi Street,
Fort, Bombay-400 023.

The Tata Iron & Steel Co. Ltd.,
24 Homi Mody Street,
Fort, Bombay-400 001.

The Tata Oil Mills Co. Ltd.,
24 Homi Mody Street,
Fort, Bombay-400 001.

Tata Refractories Ltd.,
P.O. Belpahar-768 218,
Distt. Sambhalpur,
(Orissa).

Tata Sons Ltd.,
Bombay House,
24 Homi Mody Street,
Bombay-400 023.

Tata Tea Ltd.,
1 Bishop Lefroy Road,
Calcutta-700 020.

Tata-Robins-Fraser Limited,
1 Station Road,
Burma Mines,
Jamshedpur-831 007.

Tata-Yodogawa Limited,
XLRI Computer Centre,
Circuit House Area,
Jamshedpur-831 001.

Taylor Instruments Co. (I) Ltd.,
14 Mathura Road,
Amar Nagar P.O.,
Faridabad-121 003.

Tech-Invest India (P) Ltd.,
BHEL Industrial Estate,
Hardwar-249 403.

Technofour,
NDT House,
45 Ambedkar Road,
New Sangam Bridge,
Pune-411 001.

Teletube Electronics Pvt. Ltd.,
D-115 Okhla Industrial Estate,
Phase-I, New Delhi-110 020.

Television & Components (P) Ltd.,
Plot No. 57,
GIDC Industrial Township,
Naroda-382 330,
Ahmedabad.

Texplas (India) Pvt. Ltd.,
BHEL Industrial Estate,
Ranipur,
Hardwar-249 403, (U.P.).

The Textile & Allied Industries Research Organisations,
Kala Bhavan Premises,
Baroda-390 001.

Textool Company Ltd.,
P.O. Ganpathy,
Coimbatore-641 006.

Thapar Corporate Research & Development Centre,
Post Box No. 68,
Patiala-147 001.

Themis Chemicals Ltd.,
Plot No. 69, GIDC Industrial Estate,
Vapi, Distt. Valsad,
(Gujarat).

Thermax Pvt. Ltd.
(Chemical Division),
D-13 MIDC Industrial Area,
Chinchwad,
Pune-411 019.

Three C Systems Limited,
86 Chamiers Road,
Madras-600 018.

Tide Water Oil Company Limited,
'Yule House', 8, Clive Row,
Calcutta-700 001.

TIL Limited,
1 Taratolla Road,
Garden Reach,
Calcutta-700 024.

Tiruchirapalli Regional Engg. College
S&T Entrepreneurs,
Park (TREC-STEP),
4 Post Office Street,
REC-Campus,
Tiruchirapalli-620 015.

Titagarh Steels Ltd.,
113 Park Street,
Calcutta-700 016.

Titanium Equipments &
Anode Mfg. Co. Ltd.,
Team House, GST Salai,
Vandalur, Madras-600 048.

Tool Craft
(Prop : B.R. Machine Tools
(P) Ltd.),
4(B) Peenya Industrial Area,
Phase I, 2nd Cross,
Bangalore-560 058.

Toshiba Anand Batteries Ltd.,
XXX VI/895,
Mahatma Gandhi Road,
Post Box No. 1002,
Ernakulam, Cochin-682 011.

Toshniwal Industries Pvt. Ltd.,
198 Jamshedji Tata Road,
Bombay-400 020.

Toshniwal Instruments (Bombay)
Pvt. Ltd.,
8 Mohatta Bhavan,
Off. Dr. E. Moses Road,
Worli, Bombay-400 018.

Toshniwal Instruments Madras,
267 Kilpak Garden Road,
Madras-600 010.

Toshniwal Instruments Mfg.
Pvt. Ltd.,
198 Jamshedji Tata Road,
Bombay-400 020.

Toshniwal Process Instruments Pvt.
Ltd.,
198 Jamshedji Tata Road,
Bombay-400 020.

Trackparts of India Ltd.,
4 Industrial Area,
Govind Nagar,
P.O. Udyog Nagar,
Kanpur-208 022.

Tractor Engineers Ltd.,
L&T House,
Narottam Morarji Marg,
Ballard Estate,
Bombay-400 038.

Tractors & Farm Equipments Ltd.,
861 Anna Salai,
Madras-600 002.

Transpek Industry Ltd.,
Kalali Road, Atladra,
Vadodara-390 312.

Travancore Titanium Products Ltd.,
Kochuvelli,
Trivandrum-695 021,
(Kerala).

Triveni Sheet Works Ltd.,
1 Kanpur Road,
Allahabad-221 001.

Tube Products of India
(A Unit of Tube Investment
of India Ltd.),
Tiam House, 28 Rajaji Road,
Madras-600 001.

Tummala Electronics Pvt. Ltd.,
SB-54 2nd Cross,
Peenya Industrial Estate,
Peenya, Bangalore-560 058.

Turbo Energy Ltd.,
67 Chamiers Road,
Madras-600 028.

TVS Electronics Pvt. Ltd.,
Jayalakshmi Estates,
No. 8, Haddows Road,
Madras-600 006.

TVS-Suzuki Limited,
Jayalakshmi Estate,
5th Floor, 8 Haddows Road,
Madras-600 006.

U.P. National Manufacturers
Pvt. Ltd.,
Ram Katora Road,
Post Box No. 1068,
Varanasi-221 001.

U.P. State Electricity Board,
Shakti Bhavan Extn. (3rd Floor),
14 Ashoka Road, P.B. No. 19,
Lucknow-226 001.

U.S. Vitamin (India) Limited,
Poonam Chambers,
North Wing,
Dr. Annie Besant Road,
Worli, Bombay-400 018.

The Ugar Sugar Works Ltd.,
Wakhar Bhag,
Sangli-416 416,
(Maharashtra).

Ultra Business Machineries Ltd.,
157 2nd Floor,
St. Patrick's Arcade,
Bridge Road,
Bangalore-560 025.

Ultramatix,
Survey 82/1 Plot No. 20,
Opp. Gandhi Training College,
Sankar Nagar, Parvati,
Pune-411 009.

Uni-Abex Alloy Products Ltd.,
Liberty Building,
Sir Vithaldas Thackersey Marg,
Bombay-400 020.

Uni-Sankyo Limited,
5-9-24/81 Shapurwadi,
Hyderabad-500 463.

Unichem Laboratories Ltd.,
Unichem Bhavan, S.V. Road,
Jogeswari (West),
Bombay-400 102.

Unique Chemicals,
Seth Govind Rao Smriti,
83 B&C Dr. Annie Besant Road,
Worli, Bombay-400 018.

Unique Pharmaceuticals
Laboratories Pvt. Ltd.,
Seth Govind Rao Smriti,
83 B&C Dr. Annie Besant Road,
Worli, Bombay-400 018.

Unitron Limited,
1 Industrial Area, N.I.T.,
Faridabad-121 001.

United Catalyst India Ltd.,
240 D. Nauroji Road,
Bombay-400 001.

United Ink & Varnish CO. (P) Ltd.,
37-40 Paranjape,
B Scheme, Subhash Road,
Vile Parle (East),
Bombay-400 057.

United Machinery Works Pvt. Ltd.,
Post Box No. 2038,
Bharathinagar, Ganpathy,
Coimbatore-641 006.

United Phosphorous Pvt. Ltd.,
11 GIDC Area, Vapi-396 195,
(Gujarat).

Universal Biochemicals,
Enzyme House,
Sathya Sayee Nagar,
Madurai-625 003.

Universal Cables Ltd.,
P.B. No. 9, Satna-484 001 (M.P.).

Universal Ferro & Allied
Chemicals Ltd.,
S.V. Road, Manpada,
Thane-411 607.

Universal Information
Communication Equip. Limited
(Associate Unit of Maharashtra
Electronics Development
Corporation),
A-10-37, Chitranjan Nagar,
Rajwadi, Bombay-400 077.

Universal Radiators Ltd.,
38 Mettupalayam Road,
Post Box No. 7001,
Coimbatore-641 043.

Upper India Steel Mfg. &
Engg. Co. Pvt. Ltd.,
Dhandarj Industrial Focal Point,
Sherpur Kalan,
Ludhiana-141 010.

Uptron India Limited
(Digital Systems Division)
(Formerly Uptron Digital
Systems Limited),
Near Gomti Barrag,
Gomti Nagar, P.B. No. 444,
Lucknow-226 001.

Uptron India Ltd.,
10 Ashok Marg,
Lucknow-226 001.

Uptron Powertronics Ltd.,
S 53-58 Uptron Estate,
Site-IV Sahibabad Industrial Complex,
Ghaziabad-201 010,
(U.P.).

Usha Martin Industries Limited,
14, Princess Street,
Calcutta-700 072.

Usha Microprocessors Control Ltd.,
101 Chiranjiv Towers,
43 Nehru Place,
New Delhi-110 019.

Usha Scientific Research Instt.,
14 Princess Street,
Calcutta-700 072.

Usha Telehoist Ltd.,
14 Princess Street,
Calcutta-700 072.

Usha Electronics,
1st Floor, Plaza Cinema,
Connaught Place,
New Delhi-110 001.

V Automat & Instruments Pvt. Ltd.,
F-61 Okhla Industrial Area,
Phase-I, New Delhi-110 020.

Vacuum Plant & Instruments
Mfg. Co. Pvt. Ltd.,
48-A Mundhwa,
Pune-411 036.

Vam Organic Chemicals Ltd.,
Bhartia Gram-244 223,
Distt. Moradabad,
(U.P.).

Vanaz Engineers Pvt. Ltd.,
85/1 Poud Road,
Pune-411 029.

Venkateshwara Research &
Breeding Farm Ltd.,
13/6 Milestone Panshet Road,
P.O. Girinagar,
Poona-411 025.

Veejay Lakshmi Engineering
Works Pvt. Ltd.,
B.A.T.T. Colony,
Coimbatore-641 018.

Venco Research &
Breeding Farm Ltd.,
13/6 Milestone,
Pune-Panshet Road,
Pune-411 025.

Venkateshwara Hatcheries
(P) Limited,
4H, Subhodaya Apartments,
4-1-1233, Boggulkunta,
Hyderabad-500 001.

Vickers Systems International
Limited,
P.B. No. 8556, Akurli Road,
Kandivli (East),
Bombay-400 101.

Vidyut Metalics Limited,
Bombay Agra Road,
Wagle Post Office, Naupada,
Thane-400 604.

Vijay Seeds Company Private Limited, 1-13-89, Mondha, Opp. Sham Lodge, Jalna-431 203.	Wallace Pharmaceuticals Limited, Rua-De-Ourem, Panjim, Goa-403 001.	The Wesman Engg. Company Private Limited, 'Allenby Court', 1/2, Allenby Road, Calcutta-700 020.
Vijay Wires & Filament (P) Limited, 90, KR Sagar Road, Metaagalli, Mysore-570 016.	Walter Bushnell Private Limited, Apeejay House, VIIth Floor, 3, Dinsha Vacha Road, Bombay-400 020.	West Bengal Filaments and Lamps Limited, Yule House, 8, Dr. Rajendra Prasad Sarani, Calcutta-700 001.
Vikrant Tyres Limited, 'Vikrant House', No. 54, First Main Road, V.V. Mohalla, Mysore-570 002.	Wandleside National Conductors Limited, 19, J.N. Heredia Marg, Ballard Estate, Bombay-400 038.	The West Coast Paper Mills Limited, Post Box No. 5, Bangar Nagar, North Kanada Dist. Dandeli-581 325, (Karnataka).
Vipor Chemicals, 218, G.I.D.C. Industrial Estate, Makarpura, Post Bag No. 717, Baroda-390 010.	Warner Hindustan Limited, Warangal Road, Uppal, Hyderabad-500 039.	
Vishwamitra Rathi & Sathe Construction House, 796/189-B, Bhandarkar Institute Road, Deccan Gymkhana, Pune-411 004.	Water & Mineral Exploration Research & Training Institute (A Div. of Water Development Society), C2 & C5, Industrial Estate, Moula Ali, Hyderabad-500 040.	The Western India Plywoods Limited, Balliapatam, Cannanore-670 010, (Kerala).
Voltas Limited, 19, J.N. Heredia Marg, Ballard Estate, Bombay-400 038.	Webel Business Machines Limited, 225E, Acharya Jagadish Chandra Bose Marg, Calcutta-700 020.	Westerwork Engineers Limited, 5-B, Vulcan Insurance Buildig, Veer Nariman Road, Churchgate, Bombay-400 020.
VSS Computer Engineering Company Pvt. Ltd., 323, T.V. Industrial Estate, Worli, Bombay-400 025.	Webel Crystals Limited, 225-E, Acharya J.C. Bose Road, Calcutta-700 020.	Westing Housing Saxby Farmer Limited, 17, Convent Road, Entally, Calcutta-700 014.
VXL India Limited, Aerodrome Road, Jamnagar-361 006, (Gujarat).	Webel Electronic & Communication Systems Ltd., 225-E, Acharya J.C. Bose Road, Calcutta-700 020.	Weston Electronics Limited, Weston House, 43, Okhla Industrial Estate, New Delhi-110 020.
VXL Instruments, 871, 12th Main III Block, Kormangala Layout, Bangalore-560 034.	Webel Jensen & Nicholson Limited, 225-E, Acharya J.C. Bose Road, Calcutta-700 020.	Wheels India Limited, 180, Mount Road, Madras-600 006.
W.S. Industries (India) Limited, Porur, Madras-602 104.	Webel Telecommunication Industries Limited, 4 & 5 Canal West Road, Calcutta-700 015.	Widia (India) Limited, 8/9th Miles Tumkur Road, Post Box No. 7300, Bangalore-560 073.
Walchandnagar Industries Limited (Copper Group), Construction House, Walchand Hirachand Marg, Ballard Estate, Bombay-400 038.	Welcast Steel Limited, IInd Floor, S&B Towers, 88, Mahatma Gandhi Marg, Bangalore-560 001.	Wipro Information Technology Limited, Bakhtawar 14th Floor, 229, Backbay Reclamation, Bombay-400 021.

Wipro Limited
(Power Division),
14th Floor Bakhtwar,
229, Backbay Reclamation,
Nariman Point,
Bombay-400 021.

Wockhardt Limited,
Poonam Chambers,
Shiv Sagar Estate,
Dr. Annie Besant Road,
Bombay-400 018.

Worthington Pump India Limited,
4, Mangoe Lane,
Calcutta-700 001.

Wyeth Laboratories Limited,
Apeejay House,
Dinshaw Vacha Road,
Post Box No. 11056,
Bombay-400 020.

Yamuna Digital Electronics
Private Limited,
8-2-629, Road No. 1,
Banjara Hills,
Hyderabad-500 034.

Yesha Electricals Private Limited,
C-2/18, Industrial Estate,
Gorwa Road,
Baroda-390 016.

Yuken India Limited,
Whitefield Road, Whitefield,
Bangalore-560 066.

The Zandu Pharmaceuticals
Works Limited,
Gokhle Road, South Dadar,
Bombay-400 025.

ZIP Industries Private Limited,
118, Broadway 1st Floor,
Madras-600 008.

ACKNOWLEDGEMENT CARD

No. _____

Date _____

Your No. ARR/DST/R&D Stat/88

From : _____

To
Dr. (Mrs.) A.R. Rajeswari,
Director, (I&D),
Department of Science & Technology
Technology Bhavan,
New Mehrauli Road,
New Delhi-110 016

SUBJECT :— NATIONAL SURVEY OF SCIENTIFIC AND TECHNOLOGICAL ACTIVITIES 1988-89

Dear Madam,

This is to acknowledge the receipt of your letter No. ARR/DST/R&D Stat/88 dated _____ along with two copies of the questionnaire. Further correspondence on the subject may be addressed to the officer, whose particulars are given below :

Name _____

Designation _____

Mailing address _____

SIGNATURE : _____



Dr. (Mrs.) A.R. Rajeswari
Director (I&D)

तार/Telegram : SCIENCETECH
दूरभाष/Telephone : 651912 & 667373 (PABX)
टेलिक्स/Telex : 66096 & 61805 DST IN

भारत सरकार/GOVERNMENT OF INDIA
विज्ञान और प्रौद्योगिकी मंत्रालय/MINISTRY OF SCIENCE & TECHNOLOGY
विज्ञान और प्रौद्योगिकी विभाग/DEPARTMENT OF SCIENCE & TECHNOLOGY
नया महरौली मार्ग,/New Mehrauli Road,
नई दिल्ली/New Delhi-110 016

D.O. NO. ARR/DST/R&D Stat/88

Dated

Dear

The Department of Science and Technology has been conducting National Surveys from time to time to collect data on the resources devoted to Research and Development (R&D) activities in the country. The data, so collected, is used to bring out a number of reports from time to time. The latest report for the year 1986-87 is being compiled and the printed report is likely to be available by October, 1988. In case you would like to have a copy please write to us.

We are now planning to collect information for the year 1988-89. Two copies of the questionnaire designed for collecting necessary information have been mailed to your research institutions/laboratories listed in Annexure-I. You are requested to kindly issue necessary instructions to these laboratories asking them to supply information within a month. In case some of your research institutions/laboratories have been left out in the list enclosed, the particulars thereof may kindly be sent to the undersigned to enable this Department to get in touch with them quickly by sending them also these questionnaire.

I seek your cooperation in advising your institutions to fill and send questionnaire early to us so that timely reports based on the National Surveys like the one now being conducted could be brought out.

With regards,

Yours sincerely,

Encls :

1. Annexure-I
2. Questionnaire

(A.R. Rajeswari)



तार/Telegram : SCIENCTECH
दूरभाष/Telephone : 651912 & 667373 (PABX)
टेलिक्स/Telex : 66096 & 61805 DST IN

भारत सरकार/GOVERNMENT OF INDIA
विज्ञान और प्रौद्योगिकी मंत्रालय/MINISTRY OF SCIENCE & TECHNOLOGY
विज्ञान और प्रौद्योगिकी विभाग/DEPARTMENT OF SCIENCE & TECHNOLOGY
नया महरौली मार्ग /New Mehrauli Road,
नई दिल्ली/New Delhi-110 016

Dr. (Mrs.) A.R. Rajeswari
Director (I&D)

D.O. No. ARR/DST/R&D Stat/88

Dated

Dear

The Department of Science and Technology, Government of India, undertakes National Surveys regularly to collect data on the resources devoted to Research and Development (R&D) activities in the country. The data, so collected, are compiled, processed, analysed and brought out in the report forms. The latest report for the year 1986-87 is being compiled and the printed report is likely to be available by October, 1988. In case you would like to have a copy, please write to us.

I am writing to you this letter enclosing two copies of the questionnaire (one copy may be retained for your record) for collecting data on R&D for the year 1988-89 from your organisations, as we are now engaged in the annual survey for the current year, if you have any difficulty in filling the questionnaire, please write or telephone or personally call on the undersigned.

The timely bringing out R&D data based report is entirely dependent on the early receipt of the filled in questionnaire from you and as you know that such reports would go a long way to assist the Science & Technology planning in the country. Therefore, may I call upon you to send the filled in questionnaire within a month of the receipt of the same or even earlier ?

Please fill and send the acknowledgement card to us as soon as you receive the questionnaire.

I now look forward for your cooperation in making the survey a success.

With regards,

Your sincerely,

Encls :

I. Questionnaire

(A.R. Rajeswari)

QUESTIONNAIRE-I

QUESTIONNAIRE – 1

Information on resources devoted to Science and Technology activities, 1988-89 (For Scientific and Technological Institutions under the Central and State Governments other than productive enterprises)

NOT TO BE FILLED BY RESPONDENT

- | | | | | | |
|---------------|---|--|--|--|--|
| 1. SQ. NO. | <table border="1"><tr><td></td><td></td><td></td><td></td></tr></table> | | | | |
| | | | | | |
| 2. F.S. | <table border="1"><tr><td></td><td></td></tr></table> | | | | |
| | | | | | |
| 3. O.R.D. | <table border="1"><tr><td></td><td></td></tr></table> | | | | |
| | | | | | |
| 4. State Code | <table border="1"><tr><td></td><td></td></tr></table> | | | | |
| | | | | | |

1. Name of the R&D Institution/Laboratory : _____

2. Postal Address : _____

State _____ Pin Code _____

Name : _____

Signature _____

**INSTRUCTIONS FOR FILLING UP VARIOUS QUESTIONS OF THE
QUESTIONNAIRE-I**

GENERAL INSTRUCTIONS

- (i) Please ensure that the number of characters/alphabets does not exceed the number of boxes given. Wherever necessary, abbreviations may be used.
- (ii) All characters/alphabets should be filled in Block Letters.
- (iii) Please fill complete information for the items applicable to your institution. In case exact data are not available, use estimates.
- (iv) Please stick to the units in which figures are asked (e.g. Rs. lakhs should be given in Rs. lakhs only and not in Rs. thousands or crores).
- (v) Please ensure that last two boxes in each case are filled with numeric value after decimal point (leaving aside SECTION C). Please do not put decimal point in the Boxes. (e.g. Rs. 20.434 lakhs should be given after being adjusted to two decimal places in the boxes as shown) :

		2	0	4	3
--	--	---	---	---	---

SECTION : A

- Q. III** List of Major Scientific Agencies, Central Government Ministries and State Govts. with appropriate code numbers is enclosed as Annexure 'B'. Please consult this list before filling the information in one of the boxes against Question III.
- Q. IV** The purpose of asking this question is to have a very broad idea about the nature of activities carried out by the research institutions. It is fully realised that the information being supplied is very rough estimate as no separate account is being maintained in respect of various activities. You are requested to kindly complete this question without fail.

SECTION : B

- Q. III&IV** Indicate serial number against the Boxes for which you have filled the information. If you have filled information for row I put serial number as 01 and after that if you have filled row 4 put serial number as 02.

SECTION : C

Indicate separately educational qualifications of S&T personnel deployed on full time and part time basis in R&D.

Please seek any clarification regarding the questionnaire from Dr. (Mrs.) A. R. Rajeswari/Shri R.R. Gulati/Dr. Ahmad/Shri Chetal. *The completed questionnaire should be returned to :*

**DR. (MRS.) A.R. RAJESWARI,
DIRECTOR (STS)
DEPARTMENT OF SCIENCE AND TECHNOLOGY
TECHNOLOGY BHAVAN,
NEW MEHRAULI ROAD,
NEW DELHI-110 016**

SECTION A : GENERAL INFORMATION

Q. I Name of R&D institution/laboratory (in Block letter)

[illegible]

Q. II Month and year of set up MONTH

--	--

 YEAR

--	--	--	--

Q. III Administrative controlling authority of the institution. Fill one of the boxes with appropriate code number, depending on whether the controlling authority is a Major Scientific Agency or a Central Ministry/Department or State Govt. and also tick that Box. Code numbers are given in the attached sheets. (ANNEXURE B)

I = Major Scientific Agency

2 = Central Ministry/Department

3 = State Govt.

MAJOR SCIENTIFIC AGENCY

I		
---	--	--

CENTRL MINISTRY/DEPARTMENT

2		
---	--	--

STATE GOVT.

3		
---	--	--

Q. IV Estimated Percentage of time/resources devoted to the following activities. (for example 25.4% may be indicated in the Boxes as below)

0	2	5	4
---	---	---	---

1. Basic Research				
-------------------------	--	--	--	--

--	--	--	--

2. Applied Research				
---------------------------	--	--	--	--

--	--	--	--

3. Experimental Development.....				
----------------------------------	--	--	--	--

--	--	--	--

4. Other activities				
---------------------------	--	--	--	--

--	--	--	--

Total..... (1+2+3+4)	1	0	0	0
----------------------------	---	---	---	---

1	0	0	0
---	---	---	---

Note : (a+b+b+c+d) = 100.0%

Please see Annexure 'A' for definitions.

SECTION B : EXPENDITURE ON SCIENCE & TECHNOLOGY ACTIVITY

Q. I

Please give information for expenditure on Science and Technology activities in the boxes given below. (e.g. Rs. 250.45 lakhs should be written in boxes as) :

		2	3	0	4	5
--	--	---	---	---	---	---

Details of expenditure

(EXPENDITURE IN RS. LAKHS)

	Actual 1986-87						Actual or RE(a) 1987-88						RE or BE (b) 1988-89					
Revenue/Recurring																		
Capital/Non Recurring																		
Total Expenditure																		

Note :

- Actual expenditure is preferred. In the absence of actual, please provide the revised estimate.
- Revised estimate is preferred. In the absence of revised estimate, please provide budget estimate. RE = Revised Estimate BE = Budget Estimate.
- Contributions to outside bodies as indicated against Question III on page 6 should also be included above under the appropriate heading. Please see Annexure A for definitions.

Q. II Please give information for foreign exchange component of expenditure indicated in Q. I (e.g. foreign exchange component of Rs. 20.34 lakhs should be written in boxes as) :

		2	0	3	4
--	--	---	---	---	---

YEAR	FOREIGN EXCHANGE (in Rs. lakhs)					
1986-87						
1987-88						
1988-89						

Q. III

If your Institution makes financial contribution to any of the following organisations for scientific and technical activities please fill Serial No., name and amount of contributions in the appropriate boxes given below. Please ensure that only financial grants made to outside bodies for S&T activities are included. Contributions made for welfare or charitable purposes are not to be shown here. (For example the contribution of Rs. 1.134 lakhs should be filled as) :

			1	1	3
--	--	--	---	---	---

		(CONTRIBUTION IN RUPEES LAKHS)											
		1986-87				1987-88				1988-89			
Sl. No.		NAMES OF CO-OPERATIVE RESEARCH ASSOCIATIONS											
		DEPARTMENTS OR UNIVERSITIES											
		OTHER RESEARCH INSTITUTIONS											

- Note :**
1. Before filling this page please see the instruction sheet.
 2. Contributions made to all units should be shown separately. In case the number of such units is more than the space available above, please use extra sheets.

TO BE FILLED BY RESPONDENT

Q. III Please give following information for the Full Time R&D personnel in Q. I.

Pay Scale	Number of personnel in position		
	Male	Female	Total

Total	*
-------	---

* This total should match with total number of R&D personnel as indicated in Q. I (Section C).

NOT TO BE FILLED BY RESPONDENT

S. No.	Pay Scale	Number of personnel in position		
		Male	Female	Total
1.	Less than Rs. 1400/-			
2.	Rs. 1400/- – Rs. 2600/-			
3.	Rs. 1640/- – Rs. 2900/-			
4.	Rs. 2200/- – Rs. 4000/-			
5.	Rs. 3000/- – Rs. 4500/-			
6.	Rs. 3700/- – Rs. 5000/-			
7.	Rs. 5100/- – Rs. 6300/-			
8.	Rs. 5900/- – Rs. 7300/-			
9.	Rs. 7300/- – Rs. 7600/-			
10.	Rs. 7600/- – and above			
Total				

SECTION D : OTHER INFORMATION

Q. I. Please give the following information for the year 1987-88.

Number (in figures)

1. Patents sealed	
2. Products	
3. Processes	
4. Import substitutes developed	
5. Design prototypes developed	
6. Consultancy services rendered	
7. Papers published	
8. Books published	
9. Regular Reports published	
10. Adhoc Reports published	
11. No. of S&T Personnel deputed for various National and International Seminars	
12. No. of S&T Personnel deputed for various National and International training programmes	

ANNEXURE A

DEFINITIONS FOR FILLING UP THE QUESTIONNAIRE

1. **Basic Research** may be defined as any experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular or specific application or use in view.
2. **Applied research** may be defined as any original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.
3. **Experimental development** may be defined as any systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to produce new materials, products and devices, to install new processes, systems and services, and to improve substantially those already produced or installed.
4. **Other activities** : Those activities concerned with scientific research and experimental development and contributing to the generation, dissemination and application of scientific and technical knowledge. These activities would include S&T services provided by libraries, information and documentation centres, data banks and information processing departments. Botanical and Zoological gardens, topographical, geological and hydrological surveying meteorological and seismological observations, surveying of soils, plants etc.
5. **Revenue or recurring expenditure** : It includes the cost of wages, salaries and all related labour costs, minor equipment, expendable supplies and expenditure on office and labour supplies, materials, books, journals, rent of buildings, travel and postal services.
6. **Capital/Non-recurring expenditure** : Expenditure on purchase of major installation, machinery and equipment, land for building, new buildings or large scale improvements, modifications and repair to buildings and fixed installations, land improvement work and other expenditure.

ANNEXURE – B

CODE NUMBERS

Name of Major Scientific Agency	Code No.
Department of Atomic Energy	01
Council of Scientific and Industrial Research.....	02
Defence Research and Development Organisation	03
Indian Council of Agricultural Research.....	04
Indian Council of Medical Research.....	05
Department of Science and Technology ...	06
Department of Space	07
Department of Electronics.....	08
Ministry of Environment and Forests.....	09
Department of Ocean Development.....	10
Department of Non-Conventional Energy Sources	11
Department of Biotechnology.....	12

Name of Ministry/Department	Code No.
Agriculture and Cooperation.....	01
Agricultural Research and Education.....	02
Rural Development.....	03
Fertilizers	04
Commerce.....	05
Textiles	06
Supply	07
Posts	08
Telecommunications.....	09
Defence.....	10
Defence Production and Supplies.....	11
Coal	12
Power	13
Food	14
Civil Supplies	15
Health	16
Family Welfare.....	17
Home.....	18
Education	19
Culture	20
Industrial Development	21
Petro Chemicals.....	22
Public Enterprises.....	23

Information & Broadcasting	24
Labour.....	25
Petroleum & Natural Gas.....	26
Statistics	27
Steel.....	28
Mines	29
Railways	30
Civil Aviation	31
Surface Transport	32
Tourism.....	33
Urban Development	34

Name of State.....	Code No.
Andaman & Nicobar Islands	01
Andhra Pradesh.....	02
Arunachal Pradesh	03
Assam	04
Bihar	05
Chandigarh.....	06
Delhi	07
Dadra & Nagar Haveli.....	08
Goa, Daman & Diu	09
Gujarat	10
Haryana	11
Himachal Pradesh	12
Jammu & Kashmir	13
Karnataka.....	14
Kerala	15
Lakshadweep	16
Madhya Pradesh	17
Maharashtra.....	18
Manipur	19
Meghalaya	20
Mizoram	21
Nagaland	22
Orissa	23
Pondicherry	24
Punjab.....	25
Rajasthan	26
Sikkim	27
Tamil Nadu.....	28
Tripura	29
Uttar Pradesh.....	30
West Bengal.....	31

DIRECTORY OF RESEARCH INSTITUTIONS

Please restrict the information to the space provided

Please provide the information separately for each R&D Unit.

1. Name of the R&D Laboratory with complete postal address _____

_____ Pin Code _____
State _____
2. Gram _____ Telephone Number _____
Telex Number _____
3. Name and Designation of R&D Laboratory Head
Name _____ Designation _____
4. Year of Establishment _____
5. Annual Budget for 1988-89 Rs. _____ (lakhs)
6. Number of R&D personnel as on 1-4-88 _____
7. Functions

8. Fields of Research :
(Please put (✓) against appropriate field(s) of Research listed below)

AGRICULTURE		
000 Agricultural Economics	201 Environmental Health	505 Number Theory
001 Animal Breeding & Genetics	202 Public Health	506 Topology
002 Animal Nutrition	203 Epidemiology	507 Computing Theory & Practice
003 Animal Sciences, Other*	204 Pharmacy	508 Operations Research
004 Agronomy	205 Veterinary Medicine	509 Mathematics, General
005 Plant Breeding & Genetics	206 Health Sciences, General	510 Mathematics, Other*
006 Plant Pathology	207 Health Sciences, Other*	
007 Plant Sciences, Other*		PHYSICAL SCIENCES
008 Food Sciences	ENGINEERING	600 Astronomy
009 Soil Sciences	300 Aerospace, Aeronautical	601 Astrophysics
010 Horticulture Science	& Astronautical	602 Atmospheric Physics & Chem.
011 Fisheries Sciences	301 Agricultural	603 Atmospheric Dynamics
012 Wildlife Management	302 Bioengineering & Biomedical	604 Meteorology
013 Forestry Science	303 Ceramic	605 Atmos. & Meteorol. Sci. Gen.
014 Agriculture, General	304 Chemical	606 Atmos. & Meteorol. Sci., Other*
015 Agriculture, Other*	305 Civil	607 Analytical
	306 Communications	608 Inorganic
	307 Computer	609 Nuclear
BIOLOGICAL SCIENCES	308 Electrical, Electronics	610 Organic
100 Biochemistry	309 Engineering Mechanics	611 Pharmaceutical
101 Biophysics	310 Engineering Physics	612 Physical
102 Bacteriology	311 Engineering Science	613 Polymer
103 Plant Genetics	312 Environmental Health Engin.	614 Theoretical
104 Plant Physiology	313 Industrial	615 Chemistry, General
105 Botany, Other*	314 Materials Science	616 Chemistry, Other*
106 Anatomy	315 Mechanical	617 Geology
107 Biometrics & Biostatistics	316 Metallurgical	618 Geochemistry
108 Cell Biology	317 Mining & Mineral	619 Geophysics & Seismology
109 Ecology	318 Naval Arch. & Marine Engin.	620 Paleontology
110 Embryology	319 Nuclear	621 Mineralogy, Petrology
111 Endocrinology	320 Ocean	622 Stratigraphy, Sedimentation
112 Entomology	321 Operations Research	623 Geomorphology & Glacial
113 Immunology	322 Petroleum	Geology
114 Molecular Biology	323 Polymer	624 Applied Geology
115 Microbiology	324 Systems	625 Geological Sciences, General
116 Neurosciences	325 Engineering, General	626 Geological Sciences, Other*
117 Nutritional Sciences	326 Engineering, Other*	627 Acoustics
118 Parasitology		628 Atomic & Molecular
119 Toxicology	COMPUTER & INFORMATION	629 Electron
120 Genetics, Human & Animal	SCIENCES	630 Elementary Particle
121 Pathology, Human & Animal	400 Computer Sciences*	631 Fluids
122 Pharmacology, Human & Animal	401 Information Sci. & Systems*	632 Nuclear
123 Physiology		633 Optics
124 Zoology, Other*	MATHEMATICS	634 Plasma
125 Biological Sciences, General	500 Applied Mathematics	635 Polymer
126 Biological Sciences, Other*	501 Algebra	636 Solid State
	502 Analysis & Functional Anal.	637 Physics, General
HEALTH SCIENCES	503 Geometry	638 Physics, Other*
200 Audiology & Speech Pathology	504 Logic	639 Environmental Sciences
		640 Hydrology & Water Resources
		641 Oceanography

* Please specify.

642 Marine Sciences
643 Physical Sciences, Other*

SOCIAL SCIENCES

700 Anthropology

701 Area Studies
702 Criminology
703 Demography
704 Economics
705 Econometrics
706 Geography

707 Public Policy Studies
708 Sociology
709 Urban Studies
710 Social Sciences, General
711 Social Sciences, Other*

QUESTIONNAIRE-II

Q. IV Please indicate the sources of funds for S&T activities in the boxes given below (e.g. Rs. 23.456 lakhs may be written as) :

Sl. No.	FINANCIAL SUPPORT FROM CONTROLLING AUTHORITY (PLEASE GIVE NAME)	(FUNDS IN RUPEES LAKHS)															
		1986-87				1987-88				1988-89							
	SUPPORT FROM MINISTRIES/DEPARTMENTS																
	SUPPORT FROM STATE GOVERNMENTS																
	SUPPORT FROM PUBLIC TRUSTS																
	SUPPORT FROM FOREIGN AGENCIES																
	ANY OTHER SOURCE OF INCOME																
	TOTAL																

Note :
 (a) Before filling this page please go through the instruction sheet.
 (b) As all the possible sources of funding have been included above, the total expenditure of your institution/laboratory for each year as given against Question I in Section B should be equal to the total above for each year.

SECTION C : MANPOWER EMPLOYED

Q. I Please give manpower employed by type of work.

(As on 1st April, 1988)

		1 Number of personnel engaged in R&D activities	2 Number of scientific and technical person- nel engaged in auxiliary / technical activities including skilled workers and technicians	3 Number of personnel employed on adminis- trative and other non- technical activities including Class IV unskilled staff
FULL TIME	MALE			
	FEMALE			
	TOTAL			
SC/ST EMPLOYEES	MALE			
	FEMALE			
	TOTAL			
PART TIME	MALE			
	FEMALE			
	TOTAL			

(e.g. 203 persons should be written as

0	2	0	3
---	---	---	---

- Note :**
- (a) Please allocate all personnel to three categories on functional basis rather than on the basis of qualifications.
 - (b) All the staff working in your institution/laboratory should be included in the appropriate categories.

Q. II Please give the academic background of **FULL TIME** personnel employed on R&D (given in column (1) against Full-time of Q. I in Section C).

Field of Science		Qualification					
		Ph.D.	Post Graduate	Graduate	Diploma in Engg. & Medicine	Others	TOTAL
Natural Sciences	M						
	F						
	T						
Agricultural Sciences	M						
	F						
	T						
Engineering and Technology	M						
	F						
	T						
Medical Sciences	M						
	F						
	T						
Social Sciences	M						
	F						
	T						

M = MALE
F = FEMALE
T = TOTAL

Q. II Please give the academic background of **PART TIME** personnel employed on R&D (given in column (I) against Part-time of Q. I in Section C).

		Ph.D.	Post Graduate	Graduate	Diploma in Engg. & Medicine	Others	Total
Natural Sciences	M						
	F						
	T						
Agricultural Sciences	M						
	F						
	T						
Engineering and Technology	M						
	F						
	T						
Medical Sciences	M						
	F						
	T						
Social Sciences	M						
	F						
	T						

M = MALE
F = FEMALE
T = TOTAL

TO BE FILLED BY RESPONDENT

Q. III Please give following information for the Full Time R&D personnel in Q. I.

Pay Scale	Number of personnel in position		
	Male	Female	Total

Total	*
-------	---

* This total should match with total number of R&D personnel as indicated in Q. I (Section C).

NOT TO BE FILLED BY RESPONDENT

S. No.	Pay Scale	Number of personnel in position		
		Male	Female	Total
1.	Less than Rs. 1400/-			
2.	Rs. 1400/- – Rs. 2600/-			
3.	Rs. 1640/- – Rs. 2900/-			
4.	Rs. 2200/- – Rs. 4000/-			
5.	Rs. 3000/- – Rs. 4500/-			
6.	Rs. 3700/- – Rs. 5000/-			
7.	Rs. 5100/- – Rs. 6300/-			
8.	Rs. 5900/- – Rs. 7300/-			
9.	Rs. 7300/- – Rs. 7600/-			
10.	Rs. 7600/- – and above			
Total				

SECTION D : OTHER INFORMATION

Q. I. Please give the following information for the year 1987-88.

Number (in figures)

1. Patents sealed	
2. Products	
3. Processes	
4. Import substitutes developed	
5. Design prototypes developed	
6. Consultancy services rendered	
7. Papers published	
8. Books published	
9. Regular Reports published	
10. Adhoc Reports published	
11. No. of S&T Personnel deputed for various National and International Seminars	
12. No. of S&T Personnel deputed for various National and International training programmes	

ANNEXURE A

DEFINITIONS FOR FILLING UP THE QUESTIONNAIRE

1. **Basic Research** may be defined as any experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular or specific application or use in view.
2. **Applied research** may be defined as any original investigation undertaken in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.
3. **Experimental development** may be defined as any systematic work, drawing on existing knowledge gained from research and/or practical experience that is directed to produce new materials, products and devices, to install new processes, systems and services, and to improve substantially those already produced or installed.
4. **Other activities** : Those activities concerned with scientific research and experimental development and contributing to the generation, dissemination and application of scientific and technical knowledge. These activities would include S&T services provided by libraries, information and documentation centres, data banks and information processing departments. Botanical and Zoological gardens, topographical, geological and hydrological surveying meteorological and seismological observations, surveying of soils, plants etc.
5. **Revenue or recurring expenditure** : It includes the cost of wages, salaries and all related labour costs, minor equipment, expendable supplies and expenditure on office and labour supplies, materials, books, journals, rent of buildings, travel and postal services.
6. **Capital/Non-recurring expenditure** : Expenditure on purchase of major installation, machinery and equipment, land for building, new buildings or large scale improvements, modifications and repair to buildings and fixed installations, land improvement work and other expenditure.

ANNEXURE – B

CODE NUMBERS

Name of Major Scientific Agency	Code No.		
Department of Atomic Energy	01	Information & Broadcasting	24
Council of Scientific and		Labour	25
Industrial Research	02	Petroleum & Natural Gas	26
Defence Research and Development		Statistics	27
Organisation	03	Steel	28
Indian Council of		Mines	29
Agricultural Research	04	Railways	30
Indian Council of Medical Research	05	Civil Aviation	31
Department of Science and Technology ...	06	Surface Transport	32
Department of Space	07	Tourism	33
Department of Electronics	08	Urban Development	34
Ministry of Environment			
and Forests	09	Name of State..... Code No.	
Department of Ocean Development	10	Andaman & Nicobar Islands	01
Department of Non-Conventional		Andhra Pradesh	02
Energy Sources	11	Arunachal Pradesh	03
Department of Biotechnology	12	Assam	04
		Bihar	05
Name of Ministry/Department	Code No.	Chandigarh	06
Agriculture and Cooperation	01	Delhi	07
Agricultural Research and Education	02	Dadra & Nagar Haveli	08
Rural Development	03	Goa, Daman & Diu	09
Fertilizers	04	Gujarat	10
Commerce	05	Haryana	11
Textiles	06	Himachal Pradesh	12
Supply	07	Jammu & Kashmir	13
Posts	08	Karnataka	14
Telecommunications	09	Kerala	15
Defence	10	Lakshadweep	16
Defence Production and Supplies	11	Madhya Pradesh	17
Coal	12	Maharashtra	18
Power	13	Manipur	19
Food	14	Meghalaya	20
Civil Supplies	15	Mizoram	21
Health	16	Nagaland	22
Family Welfare	17	Orissa	23
Home	18	Pondicherry	24
Education	19	Punjab	25
Culture	20	Rajasthan	26
Industrial Development	21	Sikkim	27
Petro Chemicals	22	Tamil Nadu	28
Public Enterprises	23	Tripura	29
		Uttar Pradesh	30
		West Bengal	31

DIRECTORY OF RESEARCH INSTITUTIONS

Please restrict the information to the space provided

Please provide the information separately for each R&D Unit.

1. Name of the R&D Laboratory with complete postal address _____

_____ Pin Code _____
State _____
2. Gram _____ Telephone Number _____
Telex Number _____
3. Name and Designation of R&D Laboratory Head
Name _____ Designation _____
4. Year of Establishment _____
5. Annual Budget for 1988-89 Rs. _____ (lakhs)
6. Number of R&D personnel as on 1-4-88 _____
7. Functions

8. Fields of Research :
(Please put (✓) against appropriate field(s) of Research listed below)

AGRICULTURE

- 000 Agricultural Economics
- 001 Animal Breeding & Genetics
- 002 Animal Nutrition
- 003 Animal Sciences, Other*
- 004 Agronomy
- 005 Plant Breeding & Genetics
- 006 Plant Pathology
- 007 Plant Sciences, Other*
- 008 Food Sciences
- 009 Soil Sciences
- 010 Horticulture Science
- 011 Fisheries Sciences
- 012 Wildlife Management
- 013 Forestry Science
- 014 Agriculture, General
- 015 Agriculture, Other*

BIOLOGICAL SCIENCES

- 100 Biochemistry
- 101 Biophysics
- 102 Bacteriology
- 103 Plant Genetics
- 104 Plant Physiology
- 105 Botany, Other*
- 106 Anatomy
- 107 Biometrics & Biostatistics
- 108 Cell Biology
- 109 Ecology
- 110 Embryology
- 111 Endocrinology
- 112 Entomology
- 113 Immunology
- 114 Molecular Biology
- 115 Microbiology
- 116 Neurosciences
- 117 Nutritional Sciences
- 118 Parasitology
- 119 Toxicology
- 120 Genetics, Human & Animal
- 121 Pathology, Human & Animal
- 122 Pharmacology, Human & Animal
- 123 Physiology
- 124 Zoology, Other*
- 125 Biological Sciences, General
- 126 Biological Sciences, Other*

HEALTH SCIENCES

- 200 Audiology & Speech Pathology

- 201 Environmental Health
- 202 Public Health
- 203 Epidemiology
- 204 Pharmacy
- 205 Veterinary Medicine
- 206 Health Sciences, General
- 207 Health Sciences, Other*

ENGINEERING

- 300 Aerospace, Aeronautical & Astronautical
- 301 Agricultural
- 302 Bioengineering & Biomedical
- 303 Ceramic
- 304 Chemical
- 305 Civil
- 306 Communications
- 307 Computer
- 308 Electrical, Electronics
- 309 Engineering Mechanics
- 310 Engineering Physics
- 311 Engineering Science
- 312 Environmental Health Engin.
- 313 Industrial
- 314 Materials Science
- 315 Mechanical
- 316 Metallurgical
- 317 Mining & Mineral
- 318 Naval Arch. & Marine Engin.
- 319 Nuclear
- 320 Ocean
- 321 Operations Research
- 322 Petroleum
- 323 Polymer
- 324 Systems
- 325 Engineering, General
- 326 Engineering, Other*

COMPUTER & INFORMATION SCIENCES

- 400 Computer Sciences*
- 401 Information Sci. & Systems*

MATHEMATICS

- 500 Applied Mathematics
- 501 Algebra
- 502 Analysis & Functional Anal.
- 503 Geometry
- 504 Logic

- 505 Number Theory
- 506 Topology
- 507 Computing Theory & Practice
- 508 Operations Research
- 509 Mathematics, General
- 510 Mathematics, Other*

PHYSICAL SCIENCES

- 600 Astronomy
- 601 Astrophysics
- 602 Atmospheric Physics & Chem.
- 603 Atmospheric Dynamics
- 604 Meteorology
- 605 Atmos. & Meteorol. Sci. Gen.
- 606 Atmos. & Meteorol Sci., Other*
- 607 Analytical
- 608 Inorganic
- 609 Nuclear
- 610 Organic
- 611 Pharmaceutical
- 612 Physical
- 613 Polymer
- 614 Theoretical
- 615 Chemistry, General
- 616 Chemistry, Other*
- 617 Geology
- 618 Geochemistry
- 619 Geophysics & Seismology
- 620 Paleontology
- 621 Mineralogy, Petrology
- 622 Stratigraphy, Sedimentation
- 623 Geomorphology & Glacial Geology
- 624 Applied Geology
- 625 Geological Sciences, General
- 626 Geological Sciences, Other*
- 627 Acoustics
- 628 Atomic & Molecular
- 629 Electron
- 630 Elementary Particle
- 631 Fluids
- 632 Nuclear
- 633 Optics
- 634 Plasma
- 635 Polymer
- 636 Solid State
- 637 Physics, General
- 638 Physics, Other*
- 639 Environmental Sciences
- 640 Hydrology & Water Resources
- 641 Oceanography

* Please specify.

642 Marine Sciences
643 Physical Sciences, Other*

SOCIAL SCIENCES

700 Anthropology

701 Area Studies
702 Criminology
703 Demography
704 Economics
705 Econometrics
706 Geography

707 Public Policy Studies
708 Sociology
709 Urban Studies
710 Social Sciences, General
711 Social Sciences, Other*

QUESTIONNAIRE-II

**INSTRUCTIONS FOR FILLING UP VARIOUS QUESTIONS OF THE
QUESTIONNAIRE-II**

GENERAL INSTRUCTIONS

- (i) Please ensure that the number of characters/alphabets does not exceed the number of boxes given. Wherever necessary, abbreviations may be used.
- (ii) All characters/alphabets should be filled in Block Letters.
- (iii) Please fill complete information for the items applicable to your institution. In case exact data are not available, use estimates.
- (iv) Please stick to the units in which figures are asked (e.g. Rs. lakhs should be given in Rs. lakhs only and not in Rs. thousands or crores).
- (v) Please ensure that last two boxes in each case are filled with numeric value after decimal point (leaving aside SECTION C). Please do not put decimal point in the Boxes. (e.g. Rs. 20.434 lakhs should be given after being adjusted to two decimal places in the boxes as shown) :

		2	0	4	3
--	--	---	---	---	---

SECTION : A

- Q. II** List of different ministries and state govts. with appropriate codes is enclosed as Annexure — B. If yours is a public/joint sector company, consult this list before filling the information in one of the Boxes against Q. II.
- Q. XI** The information regarding expenditure on new plant and machinery should include plant and machinery for production purposes as well as for R&D acquired during the year.

SECTION : B

- Q. II** Please indicate the location of R&D unit with the help of State code given in Annexure B.
- Q. V** Indicate serial number against the organisation to which financial contribution is made, (e.g. your Company has made contributions to Co-operative Research Association and the other research Institutions. Put serial number 01 for Co-operative Research Association (if any one Co-operative Research Association is there) and 02 for other research Institute).

SECTION : C

- Q. III&IV** Indicate separately educational qualifications of S&T personnel deployed on full time and part time basis in R&D.

Please read the instructions before completing this form. Please seek any clarification regarding the questionnaire from Dr. (Mrs.) A.R. Rajeswari/Shri R. Chetal. Where exact data is not available, use estimates

The completed questionnaire should be returned to : Dr(Mrs) A.R. Rajeswari, Department of Science & Technology Government of India, Technology Bhavan, New Mehrauli Road, New Delhi-110 016. **Telephone No.** 651912/662260 (Extn. 283), **Telegram :** SCIENCTECIL **Telex :** 66096 DST IN.

QUESTIONNAIRE – II

Information on resources devoted to Research and Development 1988-89

(For the in-house R&D units of the Productive enterprises both in Public/Private Sector)

NOT TO BE FILLED BY RESPONDENT

- | | | | | | |
|---------------|---|--|--|--|--|
| 1. SQ. NO. | <table border="1"><tr><td></td><td></td><td></td><td></td></tr></table> | | | | |
| | | | | | |
| 2. F.S. | <table border="1"><tr><td></td><td></td></tr></table> | | | | |
| | | | | | |
| 3. O.R.D. | <table border="1"><tr><td></td><td></td></tr></table> | | | | |
| | | | | | |
| 4. I.G. | <table border="1"><tr><td></td><td></td></tr></table> | | | | |
| | | | | | |
| 5. STATE CODE | <table border="1"><tr><td></td><td></td></tr></table> | | | | |
| | | | | | |

TO BE FILLED BY RESPONDENT

1. Name of the R&D Institution/Laboratory : _____

2. Postal Address : _____

State _____ Pin Code _____

Name : _____

Signature : _____

[illegible]

Q. II If yours is a Public Sector/Joint Sector Company, fill one of the Boxes with the appropriate code numbers given in the attached sheets and also tick that Box depending on whether the controlling authority is one of the Central Ministries or State Governments.
(C = CENTRAL MINISTRY) (S = STATE GOVT.)

STATE GOVERNMENT

Q. III Category of firm (Please Mark the appropriate Box against each item Y = YES, N = NO)

Category or Item (Please Mark the appropriate Box against each item Y = YES, N = NO)	Y	N
A. Small Scale Unit	☐	☐
B. Registered with DGTD	☐	☐
C. Covered under IDR Act	☐	☐
D. Covered under MRTP Act	☐	☐
E. Joint Sector Company	☐	☐
Is any foreign Company or individual own share of your company ?	☐	☐
Has your company entered into foreign collaboration agreement (As on 1.4.1988).	☐	☐
Is your company a subsidiary of a foreign company ?	☐	☐

Q. IV Does any foreign Company or individual own share of your company ?

Q. v Has your company entered into foreign collaboration agreement (As on 1.4.1988).

Q. VI Is your company a subsidiary of a foreign company ?

Q. VII Types of project
(Please provide percentage)

Q. VIII Give the number of foreign consultants working in your company.

Q. IX Major products manufactured (Given one or two major items)

Q. X

Gross turnover in Rs. Crores for 1986-87 to 1988-89
please fill as indicated in the example
(e.g. Rs. 30.45 crores should be written as indicated in
the box below)

0	0	3	0	4	5
---	---	---	---	---	---

Turnover (Rs. crores)

1986-87

--	--	--	--	--	--

1987-88

--	--	--	--	--	--

1988-89

--	--	--	--	--	--

Q. XI

Expenditure on advertisement and new plant & machinery for the whole company
including R&D in Rs. lakhs for the year 1986-87 to 1988-89.
(Please fill as indicated in the example)
(e.g. Rs. 28.466 lakhs should be written in the box
as indicated below after rounding it to two places of decimal).

0	0	2	8	4	7
---	---	---	---	---	---

**Expenditure on
advertising (Rs. lakhs)**

**Expenditure on new plant
& machinery (Rs. lakhs)**

YEAR

1986-87

--	--	--	--	--	--

--	--	--	--	--	--

1987-88

--	--	--	--	--	--

--	--	--	--	--	--

1988-89

--	--	--	--	--	--

--	--	--	--	--	--

SECTION B : RESEARCH AND DEVELOPMENT

I Month and Year from which R&D work has been taken up.

MONTH	YEAR

II * Location of R&D Unit.
(Please fill the State Code given in the ANNEXURE 'B')

----------------------	----------------------

III Expenditure on R&D for the year 1986-87 to 1988-89 in lakhs of Rupees. Please fill the figures as indicated in the example below (e.g. Rs. 19.343 lakhs should be filled in box as) :

0	0	0	1	9	3	4
---	---	---	---	---	---	---

YEAR

Revenue/Recurring expenditure (Rs. lakhs)

Capital expenditure (Rs. lakhs)

Total expenditure (Rs. lakhs)

1986-87	1987-88	1988-89

* If you have more than one R&D Unit, please fill the Questions, I, II and III in SECTION B above separately for each of such R&D unit.

Q. IV Please give information about foreign exchange component of total R&D expenditure of your company in lakhs of rupees for the year 1986-87 to 1988-89.
(e.g. Rs. 2.49 lakhs should be filled as)

0	0	0	2	4	9
---	---	---	---	---	---

YEAR Foreign exchange component (in Rs. lakhs)

1986-87

--	--	--	--	--	--

1987-88

--	--	--	--	--	--

1988-89

--	--	--	--	--	--

If your Company makes financial contributions to any of the following organisations for Research and Development please fill the Serial No., name and amount of these contributions in the appropriate boxes as indicated in the example (e.g. the contribution of Rs. 0.123 lakhs should be filled as) :

0	0	0	0	1	2
---	---	---	---	---	---

[illegible]

Note : 1) Before filling this page please see the instruction sheet.

Contributions made to all units should be shown separately. In case the number of such units is more than the space available, please use extra sheets.

SECTION C : MANPOWER

Q. I Give details of FULL TIME personnel employed in your company as on 1st April, 1988 as below :

	**Total number of employees on the pay roll of the company (I)	**No. of scientific & technical (S&T) personnel employed (II)	S&T personnel employed on R&D only (III)	Personnel employed on auxiliary activities in the R&D unit (IV)	Personnel employed for adminis- trative work in R&D unit (V)
MALE					
FEMALE					
TOTAL					

* This will include all category of personnel employed viz. those employed in Finance, Production, Marketing, Sales, R&D etc.

** This will refer to all Scientific and Technical Personnel working in all departments of organisation i.e. in Finance, Production, Marketing, Sales, R&D etc.

Q. II Give details of PART TIME personnel employed in your company as on 1st April, 1988 as below :

	*Total number of employees on the pay roll of the company (I)	**No. of scientific & technical (S&T) personnel employed (II)	S&T personnel employed on R&D only (III)	Personnel employed on auxiliary activities in the R&D unit (IV)	Personnel employed for administrative work in R&D unit (V)
MALE					
FEMALE					
TOTAL					

* This will include all category of personnel employed viz. those employed in Finance, Production, Marketing, Sales, R&D etc.

** This will refer to all Scientific and Technical Personnel working in all departments of organisation i.e. in Finance, Production, Marketing, Sales, R&D etc.

Q. III Please give the academic background of **FULL TIME** personnel employed on R&D (given in column III Q. I Section C).

Field of Science		Qualification					
		Ph.D.	Post Graduate	Graduate	Diploma in Engg. & Medicine	Others	TOTAL
Natural Sciences	M						
	F						
	T						
Agricultural Sciences	M						
	F						
	T						
Engineering and Technology	M						
	F						
	T						
Medical Sciences	M						
	F						
	T						
Social Sciences	M						
	F						
	T						

M = MALE
F = FEMALE
T = TOTAL

Q. IV Please give the academic background of **PART TIME** personnel employed on R&D (given in column (II) against Part-time of Q II in Section C).

		Ph.D.	Post Graduate	Graduate	Diploma in Engg. & Medicine	Others	Total
Natural Sciences	M						
	F						
	T						
Agricultural Sciences	M						
	F						
	T						
Engineering and Technology	M						
	F						
	T						
Medical Sciences	M						
	F						
	T						
Social Sciences	M						
	F						
	T						

M = MALE
F = FEMALE
T = TOTAL

Q. V Please give following information for the R&D personnel given in column III, Q. I (Section C).

S. No.	Pay Scale	Number of personnel in position		
		Male	Female	Total
1.	Less than Rs. 1000/-			
2.	Rs. 1000/- – Rs. 2600/-			
3.	Rs. 2000/- – Rs. 3000/-			
4.	Rs. 3000/- – Rs. 4000/-			
5.	Rs. 4000/- – Rs. 5000/-			
6.	Rs. 5000/- – Rs. 6000/-			
7.	Rs. 6000/- – Rs. 7000/-			
8.	Rs. 7000/- – Rs. 8000/-			
9.	More than Rs. 8000/-			
Total				

Note : In case well defined pay scales do not exist give average monthly salary during the year.

* This total should match the total number of R&D personnel as indicated in column III, Q. I (Section C).

SECTION D : OTHER INFORMATION

Q. I. Please give the following information for the year 1987-88.

Number (in figures)

1. Patents sealed	
2. Products	
3. Processes	
4. Import substitutes developed	
5. Design prototypes developed	
6. Consultancy services rendered	
7. Papers published	
8. Books published	
9. Regular Reports published	
10. Adhoc Reports published	
11. No. of S&T Personnel deputed for various National and International Seminars	
12. No. of S&T Personnel deputed for various National and International training programmes	

ANNEXURE A
DEFINITIONS FOR FILLING UP THE QUESTIONNAIRE

1. **Revenue or recurring expenditure :**

It includes the cost of wages, salaries and all related labour costs, minor equipment, expendable supplies and expenditure on office and labour supplies, materials, books, journals, rent of buildings, travel and postal services.

2. **Capital/Non-recurring expenditure :**

Expenditure on purchase of major installation, machinery and equipment, land for building, new buildings or large scale improvements, modifications and repair to buildings and fixed installations, land improvement work and other expenditure.

ANNEXURE – B

CODE NUMBERS

Name of Major Scientific Agency	Code No.
Department of Atomic Energy	01
Council of Scientific and Industrial Research	02
Defence Research and Development Organisation	03
Indian Council of Agricultural Research	04
Indian Council of Medical Research	05
Department of Science and Technology	06
Department of Space	07
Department of Electronics	08
Ministry of Environment and Forests	09
Department of Ocean Development	10
Department of Non-Conventional Energy Sources	11
Department of Biotechnology	12

Name of Ministry/Department	Code No.
Agriculture and Cooperation	01
Agricultural Research and Education	02
Rural Development	03
Fertilizers	04
Commerce	05
Textiles	06
Supply	07
Posts	08
Telecommunications	09
Defence	10
Defence Production and Supplies	11
Coal	12
Power	13
Food	14
Civil Supplies	15
Health	16
Family Welfare	17
Home	18
Education	19
Culture	20
Industrial Development	21
Petro Chemicals	22
Public Enterprises	23

Information & Broadcasting	24
Labour	25
Petroleum & Natural Gas	26
Statistics	27
Steel	28
Mines	29
Railways	30
Civil Aviation	31
Surface Transport	32
Tourism	33
Urban Development	34

Name of State	Code No.
Andaman & Nicobar Islands	01
Andhra Pradesh	02
Arunachal Pradesh	03
Assam	04
Bihar	05
Chandigarh	06
Delhi	07
Dadra & Nagar Haveli	08
Goa, Daman & Diu	09
Gujarat	10
Haryana	11
Himachal Pradesh	12
Jammu & Kashmir	13
Karnataka	14
Kerala	15
Lakshadweep	16
Madhya Pradesh	17
Maharashtra	18
Manipur	19
Meghalaya	20
Mizoram	21
Nagaland	22
Orissa	23
Pondicherry	24
Punjab	25
Rajasthan	26
Sikkim	27
Tamil Nadu	28
Tripura	29
Uttar Pradesh	30
West Bengal	31

DIRECTORY OF IN-HOUSE R&D UNITS

Please restrict the information to the space provided

Please provide the information separately for each R&D Unit.

1. Particulars of the Company

a) Name _____

b) Major Products Manufactured _____

2. Particulars of the R&D Unit :

a) Complete Mailing Address _____

_____ Pin Code _____

State _____

b) Gram _____ Telephone No.(s) _____

Telex Number _____

3. Name and Designation of R&D Laboratory Head

Name _____ Designation _____

4. Year of Establishment _____

5. Annual Budget for 1988-89 Rs. _____ (lakhs)

6. Number of R&D personnel as on 1-4-88 _____

7. Functions

8. Fields of Research :
(Please put (✓) against appropriate field(s) of Research listed below)

AGRICULTURE

- 000 Agricultural Economics
- 001 Animal Breeding & Genetics
- 002 Animal Nutrition
- 003 Animal Sciences, Other*
- 004 Agronomy
- 005 Plant Breeding & Genetics
- 006 Plant Pathology
- 007 Plant Sciences, Other*
- 008 Food Sciences
- 009 Soil Sciences
- 010 Horticulture Science
- 011 Fisheries Sciences
- 012 Wildlife Management
- 013 Forestry Science
- 014 Agriculture, General
- 015 Agriculture, Other*

BIOLOGICAL SCIENCES

- 100 Biochemistry
- 101 Biophysics
- 102 Bacteriology
- 103 Plant Genetics
- 104 Plant Physiology
- 105 Botany, Other*
- 106 Anatomy
- 107 Biometrics & Biostatistics
- 108 Cell Biology
- 109 Ecology
- 110 Embryology
- 111 Endocrinology
- 112 Entomology
- 113 Immunology
- 114 Molecular Biology
- 115 Microbiology
- 116 Neurosciences
- 117 Nutritional Sciences
- 118 Parasitology
- 119 Toxicology
- 120 Genetics, Human & Animal
- 121 Pathology, Human & Animal
- 122 Pharmacology, Human & Animal
- 123 Physiology
- 124 Zoology, Other*
- 125 Biological Sciences, General
- 126 Biological Sciences, Other*

HEALTH SCIENCES

- 200 Audiology & Speech Pathology

- 201 Environmental Health
- 202 Public Health
- 203 Epidemiology
- 204 Pharmacy
- 205 Veterinary Medicine
- 206 Health Sciences, General
- 207 Health Sciences, Other*

ENGINEERING

- 300 Aerospace, Aeronautical & Astronautical
- 301 Agricultural
- 302 Bioengineering & Biomedical
- 303 Ceramic
- 304 Chemical
- 305 Civil
- 306 Communications
- 307 Computer
- 308 Electrical, Electronics
- 309 Engineering Mechanics
- 310 Engineering Physics
- 311 Engineering Science
- 312 Environmental Health Engin.
- 313 Industrial
- 314 Materials Science
- 315 Mechanical
- 316 Metallurgical
- 317 Mining & Mineral
- 318 Naval Arch. & Marine Engin.
- 319 Nuclear
- 320 Ocean
- 321 Operations Research
- 322 Petroleum
- 323 Polymer
- 324 Systems
- 325 Engineering, General
- 326 Engineering, Other*

COMPUTER & INFORMATION SCIENCES

- 400 Computer Sciences*
- 401 Information Sci. & Systems*

MATHEMATICS

- 500 Applied Mathematics
- 501 Algebra
- 502 Analysis & Functional Anal.
- 503 Geometry
- 504 Logic

- 505 Number Theory
- 506 Topology
- 507 Computing Theory & Practice
- 508 Operations Research
- 509 Mathematics, General
- 510 Mathematics, Other*

PHYSICAL SCIENCES

- 600 Astronomy
- 601 Astrophysics
- 602 Atmospheric Physics & Chem.
- 603 Atmospheric Dynamics
- 604 Meteorology
- 605 Atmos. & Meteorol. Sci. Gen.
- 606 Atmos. & Meteorol. Sci., Other*
- 607 Analytical
- 608 Inorganic
- 609 Nuclear
- 610 Organic
- 611 Pharmaceutical
- 612 Physical
- 613 Polymer
- 614 Theoretical
- 615 Chemistry, General
- 616 Chemistry, Other*
- 617 Geology
- 618 Geochemistry
- 619 Geophysics & Seismology
- 620 Paleontology
- 621 Mineralogy, Petrology
- 622 Stratigraphy, Sedimentation
- 623 Geomorphology & Glacial Geology
- 624 Applied Geology
- 625 Geological Sciences, General
- 626 Geological Sciences, Other*
- 627 Acoustics
- 628 Atomic & Molecular
- 629 Electron
- 630 Elementary Particle
- 631 Fluids
- 632 Nuclear
- 633 Optics
- 634 Plasma
- 635 Polymer
- 636 Solid State
- 637 Physics, General
- 638 Physics, Other*
- 639 Environmental Sciences
- 640 Hydrology & Water Resources
- 641 Oceanography

642 Marine Sciences
643 Physical Sciences, Other*

SOCIAL SCIENCES

700 Anthropology

* Please specify.

701 Area Studies
702 Criminology
703 Demography
704 Economics
705 Econometrics
706 Geography

707 Public Policy Studies
708 Sociology
709 Urban Studies
710 Social Sciences, General
711 Social Sciences, Other*

REFERENCES

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- Sixth Five Year Plan 1980-85, Planning Commission.
- Seventh Five Year Plan 1985-90, Vol. II, Planning Commission.
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ANNEXURE – C

LIST OF PUBLICATIONS BROUGHT OUT BY THE S&T STATISTICS DIVISION, DEPARTMENT OF SCIENCE AND TECHNOLOGY, BASED ON NATIONAL SURVEYS

A. REGULAR REPORTS

i	Research and Development Statistics	1973 – 74
ii	-do-	1974 – 75
iii	-do-	1976 – 77
iv	-do-	1978 – 79
v	-do-	1980 – 81
vi	-do-	1982 – 83
vii	-do-	1984 – 85
viii	-do-	1986 – 87
ix	-do-	1988 – 89 (under print)
x	Research and Development in Industry	1976 – 77
xi	-do-	1978 – 79
xii	-do-	1980 – 81
xiii	-do-	1982 – 83
xiv	-do-	1984 – 85
xv	-do-	1986 – 87

B. OCCASIONAL PUBLICATIONS .

- i Import of Capital/Non-Capital Equipments by Industrial R&D Unit during 1978-79 (1980).
- ii Employment Pattern of Women in R&D Organisations (1980).
- iii Resources Devoted to Science and Technology
– An Overview (1980).
- iv Directory of Profile of Addresses of R&D Institutions
– Two Volumes (1981).
- v A Directory of Addresses of Research Institutions in India (1984).
- vi An Analysis of Resources by Chemical and Allied Industry R&D Institutions (1987).
- vii Directory of R&D Institutions (1987).
- viii Status of Women Science and Technology Personnel in Research and Development (1988).
- ix Science and Technology Pocket Data Book (1989).

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