ANNUAL REPORT

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BIRLA INSTITUTE OF TECHNOLOGY
MESRA, RANCHI (INDIA)

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VICE-CHANCELLOR'S REPORT

Over the past few decades appreciable investment has been made for higher education both by the Government and Private Sector. This investment is now paying dividends in the form of competent manpower so essential for the conutry's development in every sector. We have today one of the largest scientific and technical manpower even then investment in higher education has to continue to hold our own place in the liberlised economy with highly competitive market.

It is a matter of pride that Birla Institute of Technology has always been in the forefront in the field of Technical and higher education ever since its inception. It has continuously updated its curricula and modernised laboratories of most of its Departments, to meet the growing and challenging needs of the Industries. The Institute has always interacted with the Industries while designing its curricula and programmes.

The Institute has started new programmes in emerging areas of Engineering & Science and is in the process of developing basic teaching facilities and laboratories. Bachelor of Engineering Course in Polymer Engineering has been started. The Institute is introducing M. Tech. (Remote Sensing) programme from the current academic session. The Courses in other emerging field viz. Biotechnology and Food Technology have also been planned. There is acute shortage of trained personnel to manage Food processing and Biotechnology based Industries. Education of girls and women who represent 50% of the country population is also given due importance. Two degree level courses exclusively for girls are being planned. These are B. Sc. (Electronics) and B. Sc. (Computer Applications). The Laboratories and other facilities are being developed in these fields. Assistance from various sources is being sought for this purpose.

Encouraged by the success of the off-Campus Programmes of the Institute at Calcutta, Hyderabad and Jaipur Centres, the Institute is planning to open similar Centres at other cities.

The Institute has been invited to establish a centre at Bahrain and initiate its off campus Programmes in Engineering, Management and related areas to meet the needs of the Gulf area.

The Institute is actively considering the various aspects of the proposal.

Development of Medium Scale and Small Scale Industries, the programmes initiated by Science & Technology Park is progressing well, though many problems particularly of finances are yet to be overcome.

Significant improvements in the laboratories of the various Engineering and Science Departments have been made. Central CAD Laboratory has been made functional by providing some of the most modern systems and software. In the I.C. Engine laboratory of the Department of Mechanical Engineering, Indimeter-617 is being added shortly to meet the demands for P. C. based monitoring of the engine variables.

In the laboratories of the Computer Science, Silicon graphics INDY (R4600), Image Processing System has been added. The system is being used for projects on image processing and development of various application programmes. The modernisation of laboratories of Space Engineering and Rocketry and other Departments reported earlier is also being actively pursued. Rocket Propulsion Laboratory is being modernised. Research activities in most of the Departments were also actively progressed on current topics. Three patents applications were filed by the Department of Space Engineering and Rocketry. In the Department of Pharmaceutical Sciences, researches on newest dosage form the Transdermal Dosage system using various rate controlling polymer is being actively pursued. Similarly, in other Departments Research Scholars are actively engaged in their chosen field of interest.

In an attempt to preserve the environment and forest cover, a World Bank aided project on "Eucalyptus Wood Conversion Technology" shall be taken up shortly. The additional infrastructure required for the purpose is being developed at Birla Institute of Scientific Research, Ranchi.

This year the Institute has successfully organised All India Inter University Youth Festival 1996. Over 600 participants drawn from 59 Universities participated in the festival. The festival was held between 7th - 11th February, 1996 and was inaugurated by the Chief Minister of Bihar and His Excellency the Governor of Bihar was the Chief Guest at the Valedictory function on the last day.

The Institute has made significant progress in the field of Non-Conventional sources of energy. Number of Courses are being offered in this field at graduate and post-graduate levels. A centre for advanced level research in the field is planned.

With the increase in number of Post-graduate programmes and new courses in Polymer Engineering, Architecture and those planned in Food Technology, Biotechnology and in other vocational fields, the hostel accommodation at the Campus has to be augumented.

ADMINISTRATION

B. I. T., Mesra is a 'Deemed University' under Sec. 3 of the UGC Act, 1956. It functions under the overall supervision, direction and control of a high-power Board of Governors, comprising representatives of the Ministry of Education, Government of India, the University Grants Commission, the State Government, the Chancellor, the All India Council for Technical Education, the Trust and the Institute Faculty. Mr. G. P. Birla is the Chairman of the Board of Governors. The Governor of the State of Bihar is the Chancellor of the Institute. Composition of the Board of Governors is given in Annexure - I.

The Technical Council decides the academic policy of the Institute. It controls and approves the curriculum, courses and examination results. It appoints committees to look into specific academic matters arising from time to time. The teaching, training and research activities of various departments at the Institute are constantly under review to improve both facilities and standards. The Vice-Chancellor of the Institute is the Chairman of the Technical Council. Members of the Technical Council are listed in Annexure - II.

Financial advice to the Institute is given by the Finance Committee. Similarly, the Building & Works Committee advises the Institute in matters relating to building works activity. The constitution of the Finance Committee and Building & Works Committee is given in Annexure - III.

In addition, there are a number of other committees like the Regulation Committee for Under-graduate and Post-graduate Courses, Semester Programme Coordination Committee, Admission Committee, Scholarship Committee, Students' Welfare Committee etc. These Committees are appointed by the Technical Council to help the administration in the efficient running of the Institute.

GENERAL REVIEW

BRIEF HISTORY

The Institute was established as an All India Institute for imparting technical Education and Research in 1955 by the Hindustan Charity Trust. Initially it functioned as an affiliated college of the erstwhile Bihar University and later in 1960 upon creation of new Universities in the State, its affiliation was transferred to the Ranchi University.

In pursuance of the recommendations of the Education Commission, Government of India (1964-66) and on the basis of the report of a Joint Selection Committee of the UGC and AUDIT, in March 1972, the Institute was granted the status of an 'Autonomous' College by making special provision in Bihar State Universities Act. The Rules for its governance were made by the Chancellor of the Universities of Bihar.

On the basis of its continued excellence, and approval by the OUCH, the Institute was declared a "Deemed University" in August 1986 under Section 3 of the UGC Act.

Since its inception the Institute is updating its academic standards, and has now acquired a pride of place in Technical Education and is one of the Premier Institute in Eastern India.

COURSES & DEGREE PROGRAMMES

Currently it is offering a variety of curricular programmes as detailed below :

Course	Intake capacity	Duration of Course	Year of Introduction of the Course
I. Bachelor's Degree Courses			
1. Electrical & Electronics Engg.	45	4 years	1955
2. Mechanical Engg.	90	do	1955
3. Civil Engg.	60	do	1957
4. Electronics & Comm. Engg.	60	do	1964
5. Production Engg.	30	do	1964
6. Pharmacy	30	do	1972
7. Computer Science	30	do	1983
8. Architecture	40	5 years	1993
9. Polymer Engg.	30	4 years	1995
II. Master's Degree Courses			
1. Electrical	12	1 1/2 years	1964
i. Control Systems			
ii. Power System			
2. Mechanical	6	do	1964
i. Heat Power Engg.			
3. Civil	2	do	1965
i. Soil Mechanics			
ii. Structural & Foundation Engg.			
4. Electronics & Communication	12	do	1965
i. Instrumentation			
ii. Microwave			
5. Space Engg. & Rocketry	10	do	1965
i. Rocket Propulsion			
ii. Aerodynamics			
6. Business Administration	30	2 years	1980
i. Marketing			
ii. Finance			
iii. Systems			
iv. Industrial Management			

7. Pharmacy i. Pharm. Chemistry ii. Pharmaceutics	10	1 1/2 years	1983
8. Computer Applications	30	3 years	1984
9. M.Sc. Bio-Medical Instrumentation	15	2 years	1992
10. M.Sc. Information Science	15	2 years	1993

III. P.G. Diploma Courses

1. Computer Applications	30	1 year	1988

IV. Continuing Education (Part-time) Post-Graduate Programme

To enable working Engineers to update their technologies, the part-time Post-Graduate Programme offers 3 levels :

1. A Certificate of Merit after completing 5 units.
2. A Diploma after completing 10 units, and
3. A Degree after completing 15 units.

The Disciplines, Intake capacity, Duration are :

Course	Intake capacity	Duration of Course	Year of Introduction of the Course
1. M. E. Civil Engineering Electrical Engineering Mechanical Engineering Industrial Automation	-	3 Yrs.	1974
2. Management			
M.B.A.	30	3 Yrs	1980
3. Computer Applications			
M.C.A.	30	4 1/2 Yrs.	1984
D.C.A.	30	1 1/2 Yrs.	1988

In addition to the above, specialization at Master's level in Remote Sensing has also been approved and a number of courses in other specialization have been planned.

V. Doctor of Philosophy

The Institute offers Research Programmes leading to Ph.D Degree in all the above disciplines.

VI. Off Campus Programmes

Institute also offers some of these programmes at its Extension Centre presently located at the Calcutta, Hyderabad and Delhi. Few more such Centres have

ENROLMENT

There are 1703 students who have been enrolled during the current Academic year 1995-96. The branch-wise enrolment is detailed below. Of these there are 312 girl students and 67 foreign students :

Course	Full-time	Part-time	
B.E	1104	-	
B.Arch.	57	-	
B.Pharm.	85	-	
M.C.A./D.C.A	170	68	
M.B.A	43	31	
M.Pharm.	13	-	
M.E	84	25	
Bio-medical Instrumentation	8	-	
Information Science	15	-	
	1579	124	
Total			1703

FACULTY & STAFF

Against the sanctioned strength of 213 Faculty positions, 127 are filled with 84 vacancies. The break-up is as follows :

Category	Sanctioned	In Strength	Vacancies
Professors	57	44	13
Associate Professor	62	25	37
Assitt. Prof./Lecturers/ Associate Lecturers	94	60	34
	213	129	84

The number of administrative and supporting staff are approximately 250. In addition, there are about 300 Class-IV Staff to look after the General Maintenance of electricity, water supply, gardens, security, hostels and allied services. It may also be mentioned that under the Welfare Programme for the weaker sections of society specially from villages adjoining the Institute Campus, The Institute has engaged about 100 persons as Trainees/Apprentices in various technical and other trades. While under training these persons are paid some allowance/stipend on a regular monthly basis and they are absorbed in regular posts against vacancies arising, from time to time.

All academic staff have been provided accomodation on the Campus. About 60% of the administrative and other supporting staff have also been provided accomodation on the Campus.

OUT-TURN OF GRADUATES & POST-GRADUATES

In the Annual Convocation of the Institute held on 29th March '96 Dr. Abid Hussain, Vice Chairman, Rajiv Gandhi Foundation, New Delhi was the chief guest and delivered Convocation address. His excellency Dr. A. R. Kidwai, Governor of Bihar and Chancellor of the University presided over the function.

During the year 1995-96, 534 students have qualified for the award of Degrees and Diplomas of the Institute; 343 for Under-graduate Degrees (B.E/B.Pharm.) and 192 for Post-graduate Degrees (M.E., M.Pharm., M.B.A., M.C.A. & D.C.A.) and 1 Ph.D. Degrees; the break-up is as follows :

		No. of students graduated in 1995-96		Total No. of graduates upto 1996
1.	**Under-Graduate Degree**			
	B.E. (4-Yr.) Degree Course			
	Civil Engineering	27		
	Computer Science	37		
	Electrical & Electronics Engineering	48		
	Electronics & Comm. Engg.	82		
	Mechanical Engineering	82		
	Production Engineering	38		9512
	B.Pharm.(4-Yr.)Degree Course	29		460
	Total :	343		9972
II.	**Post-Graduate Degree**			
	M.E.			
	Civil Engineering	08		
	Electrical Engineering	05		
	Electronics & Comm. Engg.	18		
	Mechanical Engineering	05		
	Space Engg. & Rocketry	02		
	Automated Mfg. System	11		
			49	465
	M. Pharm.	10		136
	M. B. A.	45		688
	M. C. A.	49		328
	D. C. A.	23		182
	B. M. I.	07		07
	M. I. S.	09		09
	Total	192		1815
III.	Ph.D.	01		38*

*Note : The figures show the Ph.D Degrees awarded after the Institute has become Deemed University in1986.

CAMPUS AND PHYSICAL FACILITIES

The Institute is fully residential and extends over 780 acres. The main buildings of the Institute covers an area of over 30,000 sq. mtrs. and accomodates the various research and training laboratories, administrative offices and lecture rooms. The Workshop annexe has a covered area of 4,000 sq. mtrs. The laboratories and offices of the Department of Space Engineering & Rocketry are situated for security reasons in a sub-campus, about half a kilometer away.

For the convenience of working Engineers to participate in Post-graduate programmes a Technology Centre was established in Ranchi City at Lalpur in 1976.

The campus is self contained amidst well laid lawns, with its own protected water supply, marketing centre, dispensary, bank and schools.

Institute Building	Sq. mtrs.
i. Main building & Administrative block	3700
ii. Class room & laboratories, Drawing Halls, Staff rooms etc.	9300
iii. Library Block	2600
iv. Space Engg. & Rocketry Block including explosive and Rocket Fuel Centre	930
v. Workshop Sheds, General Stores, Garage/Godown	3721
vi. Gymnasium	850
vii. Animal House	400

Residential Complex	
i. Staff quarters in different categories	300 Nos.
ii. Residential Complex for supporting services : Forest Guards, Dairy, Shop Keepers, Washermen etc.	70 Nos.

Hostel Accomodation	
i. Seven Boy's Hostels	1410 Rooms (single)
ii. Two Girls' Hostel	140 Rooms
iii. One Foreign Students' Hostel	100 Rooms (single)

Guest Accomodation

The Institute maintains three Guest Houses. 2 General purpose Guest House with 38 furnished rooms and a VIP Guest house with 3 deluxe double bed-rooms to accomodate guests appropriately.

Auditorium

To meet the growing needs of the community for public functions an Open Air Theatre is partly completed and can seat 2500 persons.

There is also a Mini-Auditorium with seating capacity of 450 in the main Administrative Block.

Games & Sports

The Institute has a Gymnasium and is spacious enough to accomodate indoor games. Extensive play grounds are provided to facilitate sports. They are :

1.	Field Tracks for Sports/Athletics	- 1
2.	Cricket ground	- 1
3.	Football grounds	- 2
4.	Hockey grounds	- 2
5.	Basket Ball grounds	- 4
6.	Volley Ball grounds	- 6
7.	Tennis Courts	- 6
8.	Badminton Courts (One Indoor and 5 Outdoor)	- 6

Canteen Services

A moderately furnished canteen, provides snacks for students and staff.

Dispensary-cum-Health Unit

An eight-bed hospital provide the medical facilities to the large campus community mainly as an outdoor patient unit. This unit is supported by three full time and one part-timedoctors and other para medical staff. Excellent rapport exists for acute medical needs with the Government Medical College Hospital at Ranchi.

Marketing Centre

A well run Cooperative Stores provide the daily requirements of the campus of nearly 5,000 residents. Additional shopping complex is provided for sundry needs.

The construction of a full-fledged Marketing Complex and Cooperative Book Store to meet the growing needs of the Campus is nearing completion. The annual commodity sold through these outlets of the Campus exceeds Rs. 2 crores mark in value.

Others		Sq. mtrs.
i.	Consumers' Co-operative Stores	375
ii.	N C C Block	400
	Rifle Firing Range	1 No.
	NCC Parade ground	1 No.
iii.	Primary/High School (temporarily housed in Mechanical Engg. Block)	744

CENTRAL FACILITIES

COMPUTER CENTRE

The Computer Centre is equipped with five high end systems known to be qualified under the Super Mini Computer category, they are :

DEIL 5100 from Digital India with RISC CPU, R3000 and for the floating point unit R 3010, with a clock speed of 20 MHz. It delivers a SPEC Mark 1 of 14.9 and MIPS 2 of 19.4. The primary memory is 40 MB and disk capacity is 1.85GB. It has 95 MB CTD and currently supports 32 terminals. The operating system is ULTRIX and it has C, Pascal, Cobol and FORTRAN Compilers alongwith INGRESS Relational Databases.

TUL U6000/65 a high end system from TATA UNISYS with two 80486 CPUs operating at 50 MHz. It has 64 MB Processor RAM and 1 MB external cache per CPU. Secondary storage is 4.35 GB in the form of SCSI Hard disk. 150 MB CTD and 1.2 MB FDD. There is also a 550 MB CDROM. The system supports 47 terminals and runs AT & T Unix with X windows, Oracle and Scientific Subroutines. The languages supported are C, Basic, Fortran 77, Pascal C ++, Image processing and vision software. Recently three Digitals Alphas are installed. One of them operates at 175 MHz with 4 GB Hard Disk and 96 MB processor RAM. It runs on VMS operating system supporting FORTRAN, PASCAL, C, C++ and COBOL compilers, GKS and PHIGS. It is linked with a two 8-port terminal server over DECNET.

The second system is an ALPHA operating at 125 MHz with one giga byte hard disk space and 32 MB RAM. It has OSF operating system with FORTRAN PASCAL and C Compilers.

The third system is an EISA based Alpha operating at 150 MHz withWindows-NT. All the Alphas systems have 600 MB CD-ROMs.

All the above systems are networked on Ethernet with TCP/IP and NFS. Apart from the above, there are 10 PC/PC XT machines, and 20 PC-AT 386/486 range of machines with SVGA, 4 MB or more RAM and 80 MB or more hard disks. The micro computer based software packages include Fox-Pro for Windows 3.1, MS Fortran, MS Word 6.0 for windows 3.1, MS Visual Basic 1.0, Borland and C++, Turbo Pascal 7.0.

Systems like Silicon Graphics : IND Y (R 4600) Image processing and multi-media and Wiprosystem have also been installed recently.

There is also a 2 transputer based parallel processing workstations with par-allel C, parallel Fortran and one Tektronix 4115B graphics workstation. Very soon 1-net access facility for worldwide linkage will be provided. The Computer Laboratory is catering to the services of 120 students at a time in one slot. Also laboratory is kept open all 7 days from 8 a.m ro 9 p.m. for the users.

LIBRARY

The Library subscribes over 125 Indian and foreign journals annually. During the current year 1000 volumes were added to the existing stock of library. The up-

to-date stock of the Library comprises of 60,500 books and 15,500 back volumes. Facilities for microfilming, photocopying and off-line information retrieval are also being provided by the library.

ACADEMIC INNOVATIONS RESEARCH & DEVELOPMENT

With the support of the Government of India during 1995-96, the Institute has been able to establish and develop infrastructure for interdisciplinary research and development and curriculae in Engineering, Pharmaceutical and Applied Sciences. Additional facilities have been created for Post-graduate studies and research in the area of Applied Sciences to meet the needs of specialized research workers and teachers. New programmes for Industry-institute interaction have also been developed.

A new Department of Applied Mechanics has been created with a view to develop Engineering Mechanics Laboratory and use of Computers for simulation of studies in complex engineering problems.

A post-graduate Diploma (1 1/2 years) in Hospital Administration which has already been approved is proposed during the coming years.

With the creation of Department of Remote Sensing M.TECH programme in Remote Sensing is beiung offered from current academic year.

Computer, Management & Architechture department are also offering some of these programme at off campus centers presently located at DELHI, CALCUTTA and HYDRABAD. A few more such centers have been planned to be opened in future.

The Institute has submitted the following proposals for approval by the All India Council for Technical Education, New Delhi and these courses shall be introduced after receiving such approval.

1. M.Sc. Electronics
2. M.Sc. Applied Sciences
3. M.Pharm. in Pharmacognosy
4. M.Tech. in Bio-Technology

Institute is also gearing itself to start new U.G. programmes in emerging areas of Computer, Electronics and Food Technology. These are :

B.Sc. Computer Science]
B.Sc. Electronics] 3 years programme. Exclusively for girls. Proposed at Lalpur Centre.

B.Tech. Food Technology - a 3 years Post B. Sc. programme. Proposed at B. I. T., Mesra.

In pursuance of the new Education Policy of the Government of India, the Institute is keeping pace with the latest technological advances in identified areas of emerging technologies and is creating and establishing necessary infrastructure of Education, Research and Training. The Microprocessor Development Centre has already established a rapport with ASIL, MECON, CMPDI, HEC, etc. for design and development of instrumentaion and constrol systems for real time Computer controls. Artificial intelligence and Robot technology are being moved from the reserach do-

main to the solution of practical problems. Futher, the effforts are being made for commercial exploitation of various technologies developed at various Centres/Departments.

MICROPROCESSOR RESEARCH CENTRE

The microprocessor laboratory and Artificial Intelligence Laboratory have been upgraded to handle complex digital signal processing applications, for all real time control applications in the area of Industrial Processes and Bio-Medical Instrumentation. This yields an intelligent approach to problem solving.

ROBOTICS LABORATORY

The Robotics and Microprocessor laboratories are expanded with more floor space for ease of working. A software-hardware project on Mobile Transfer Vehicle (MTV) in collaboration with MECON is under development. This project was taken up during the previous years and has progressed well. Hardware sub systems were tested, and software prepared. The MTV is a four wheeled Robot with separate drive for each of the four wheels. This allows the vehicle to move in any direction required on a floor.

PLASMA ENGINEERING

Since the last few years, the Institute has been activity engaged in developing Plasma Technology facilities. Some of the the major facilities available at present are

1. A Cascaded Plasma Arc Generator (Power - 18KW, Hyperthem U.S.A.). It can produce thermal plasmas of Ar, N2, H2 He etc. which may be used as a 'Heat Source' for screening materials for high temperature applications (thermal Shock, thermal stress ablative materials etc.) and for matrials processing applications.

2. Two glow discharge units equipped with vacuum units (Rotary and Diffusion pumps) having capacity to reach vacuum of the order of 10-6 Torr.

3. A very High Resolution grating monochromator (Model THR, JOBIN YVON, Resolution of 175,000 in single pass and 350,000 and double pass and dispersion of 2.6 A /mm in single pass and 1.3A / mm in double pass. This along with Fibre Optic Couplers, Photo-multiplier tube and Read out system is now being developed as a non-intrusive plasma diagnostic technique based on Optical Emission Spectroscopy (OES) for the study of plasma parameters.

Work on inter disciplinary project entitled "Study of Arc Plasma Characteristics of a Cascaded Arc Plasma Generator" sanctioned by Ministry of Science & Technology, DST, New Delhi to Dr. R.C. Prasad of the Electrical Engg. Department as Principal Investigator and Dr. P.K. Barhai of the Applied Physics Department as Principal Co-investigator is in progress. The basic aim of the project is to characterize the Plasma produced by Cascaded Plasma Arc Generator using OES and radial heat flux distributions.

Work on another project "Metallic Multilayer Surface Coating Using Anodic Vacuum Arc" under the guidence of Dr. P.K. Barhai as Principal Investigator and Dr. R.C. Prasad and Mrs. A. Jain as Co-Investigators and funded by ISRO, Govt. of India is progressing.

Final year undergraduate students are also encouraged of use these facilities.

FLEXIBLE MANUFACTURING AUTOMATION LABORATORY

Product and process development in a continuous process in any industry. Rapid advances in manufacturing technology with computer controlled processes and management information system, are reinfforcing the recognition that specialized training on manufacturing is necessary for their potential to be realised. Realizing the need for an integrated programme on the development of Automation Technology, a Flexible Manufacturing Automation Laboratory has been set up in the Department of Production Engineering. Setting up of this laboratory is a step in the methodology of unmanned maufacturing. The laboratory is designed to carry out experiments on various aspects of automation as applied to Production Engineering field.

The equipment and machineries installed in the laboratory include :

1. CNC Trainer Lathe (EMCO)
2. CNC Trainer Milling (EMCO). It has 0.1 micron resulation.
3. A complete FMC comprising of -

a. TRIAC CNC Milling Machine
b. ORAC CNC Trainer Lathe
c. Conveying system with Conveyer
d. Two MOVEMASTER Robot
e. PC and PLC Control System for for co-ordinating contorl actions of different elements (DENFD)

4. Co-ordinate Measuring Machine (CMM - KEMCO)

The laboratory offers excellent opportunities for carrying out research in the areas of CAD, CAM and Robot assisted flexible automation. Some of the projects on which the work is presently in progress include :

1. PETRI-NET Modelling of Automated Manufacturing System.
2. CAD for Toolings.
3. Communication Network in CIM
4. Design and development of Robotic Workstation.
5. Knowledge based system for FMS
6. Robotic End - Effector - Toolings and Grippers.

ENVIRONMENTAL ENGINEERING LABORATORY

With the increased awareness about environment it has become necessary to have a well equiped laboratory where the testing facilities for various environmental pollutants can be carried out with precision and speed. With this object in mind an Environmental Engineering Laboratory has been set-up in the Department of Civil Engineering. The laboratory is well equipped with Scalar Analyzer which is microprocessor controlled and has capacity to test 37 parameters at a time. The data system can handle upto 16 channels simutaneously. All channels are displayed on CTR. The data system stores all the raw data for post run manipulations, achiveing, transfer and reformatting of reports. Curve generation in all chanels is an added attraction.

The laboratory is being used for regular training to Under-graduate and Post-

graduate students and also for carrying out consultancy work of various industries.

CENTRE FOR HISTORY OF SCIENCE

The Centre is engaged in studies on the evolutionary aspocts of sciontific development. The centre has rich collection of books, journals and othermaterials for further investigation. About 400 research papers articles, notes & reviews have been published in indian & foreign jurnals from the Centre.

THE BUILDING CENTER (Nirman or Nirmithi Kendra)

The Housing and Urban Development Corporation (HUDCO), Ministry of Urban Development, Govt. of India in collaboration with Department of Civil Engineering, Birla Institute of Technology, Mesra, Ranchi has established a Building Centre. The Building Centre's main objective is to carry technology to grass root level inthe field of Construction Engineering. Futher, the centre is striving for propagation, dissemination of appropriate and cost effective technologies for application in housing and building programmes. The centre has drawn up a future programme to give the right level of expousure on Organisational, Technological, Managerial, Financial aspects and logistic issues in helping entrepreneur to run such Centres in the right manner. The Cetre is developing training module, manufacturing and marketing module, construction module an housing guidance and information module for the Chhotanagpur Area.

DEPARTMENT OF APPLIED MECHANICS

With a view to expanding avenues for development and interactive programme, the applied Mechanics department is formed with five faculty members.

Presently, research work in the field of computational simulation of different Engineering problems related to Structural, Heat Transfer/Vibration and momentum base has been started.

DEPARTMENT OF ARCHITECTURE

This is the third year of the department of Architecture after its inception in 1993-94. The senior most students have now reached in VI semester of their 10 semester programme.

During the year under report, 1995-96 all the courses run smoothly with existing faculty position including some Part-time teaching staff. Two staffs, Mr. K. K. Mukherjee and Mrs. J. Mukherjee joined the department as Assistant Professor.

A CAD laboratory for graphics and Computer Aided Design and Drafting has been setup. The facilities regarding space and terminals are in the process of improvement. An additional room has been allocated for the studio-cum-class room to cater the need of the students.

As a part of curriculum activity, the students of this department visited several places of architectural importance. The students of III & V semester had a twelve days educational tour in South India between 3-15 December, 1995. Prof. K. K. Mukherjee and Mrs. J. Mukherjee accompanied the students. They covered the

important places of architectural monuments in Madras, Bangalore, Mysore, Trivandrum, Kodaikanal, Madurai, Tiruchirapally, Thanjavur, Villupuram.

The department organised one day workshop on Solar Efficient Building Design (Concepts, Techniques and Applications) on 23rd January, 1996. This workshop was sponsored by Ministry of Non-Conventional Energy Sources, Government of India, New Delhi and Bihar Renewable Energy Development Agency, Patna. There were 30 experts from Delhi, Calcutta, Patna and Ranchi in the workshop alongwith 60 students of B.Architecture. Prof. A. K. Aggarwal, Dean, Under-graduate Studies and Head, Deptt. of Architecture and Prof. A. Debnath, Assistant Professor of the department were the Chief Co-ordinator and Co-ordinator respectively. Mr. K. D. Sinha, IAS, Secretary, Govt. of Bihar inaugurated the workshop whereas Prof. J.S. Ruhela, Vice-Chancellor of the Institute Chaired the Inaugural function. Dr. R. K. Banerjee, former Dy. Director of IIT., Kharagpur and Dr. B. B. Puri, President, Vaastu Kala Academy, New Delhi Chaired the Technical Sessions.

Mr. Prakash Chandra Onrao, Director, Bihar Tribal Welfare Research Institute, Ranchi delivered a special lecture on Tribal Art and Crafts of Chotanagpur. His lecture was well received by the students and they expressed their desire to work in this field.

The students of the department participated in number of competitions of All India Architectural Design and won prizes or appreciations.

1. "A Modern Commercial Complex in a prime locality at Nagpur" an All India competition organised by M/s. Shivalker Developers, Nagpur.

2. 5 students of the department represented the NASA'96 convention at VREC, Nagpur between 2-4 February, 1996.

3. At the zonal convention of National Association of Students of Architecture (NASA) which was held at B. E. college, Shivpur, West Bengal from September 14 to September 16, 1996, Students of this department participated and competed with the 8 other teams from Eastern Zone, which included strong teams from some of the well established departments of Architecture like I. I. T. Kharagpur, B. E. College Shivpur and Jadavpur University.

It is heartening to note that B.I.T. Mesra team was declared overall champion and bagged Josheph Allen - Stein Trophy. Team also won other prizes including first prize for sessionals.

4. Like the previous year, students of the department bagged second prize of Rs. 10,000/- and a commendation prize of Rs. 2,000/- in 2nd ISLE Lighting Design competition organised by Philips India, New Delhi which was held in 1995.

Prof. A. Debnath attended Seminar held at Patna on 14th October, 1995. He also attended a Workshop on Architecture held at Calcutta during November 17 - 19, 1995.

BIO-MEDICAL INSTRUMENTATION

During past three decades most significant advance in Clinical practice has been attributed to interactions between scientists, technologists and medical profes-

sionals. Biomedical Scientists have devised necessary tools to meet the challenges and this interdisciplinary field has evolved and grown to the point that it is now accepted as an established discipline. Modern diagnosis as well as therapy has become dependent upon the growth in technology. This is due to concurrent growth in physical and biological sciences.

Considering the need of scientists and technologists in this field a course in Biomedical Instrumentation leading to M.Sc.(BMI) was introduced in 1992. Since the course is interdisciplinary in nature Department of Electrical and Electronics, Department of Electronics and Communication, Department of Pharmacy and B.M. Birla Heart Research Centre at Calcutta and number of leading medical practitioners are participating in this degree program.

All the students who have graduated in this course are well placed in job positions. They are very well received by well known hospitals and Industries which are entering the growing field of Biomedical Instrumentation.

DEPARTMENT OF CIVIL ENGINEERING

Apart from graduate and post-graduate programme in Civil Engineering, the department is actively engaged in :

- Undergraduate programme for full time students leading to B.E degree
- Postgraduate programme for both full time and part time students leading to M.E. degree
- Research and Development activities
- Scientific and Industrial consultancy services
- Testing services.

In graduate programme, apart from the usual class work, the students were assigned with innovative and searching projects. The projects were so designed that the students learn advanced concepts in Civil Engineering and are exposed to the practical aspects of the problems.

In Post-graduate curriculum, students were offered specialisation in the field of Soil Mechanics in full time programme and in the field of Structural Engineering in part time programme.

The department has during the period under review undertaken various research and development programme such as river basin development, hydraulic modelling, soil structure interaction problems, buckling problems of layered plates, effect of environmental conditions on composite material, off-shore structure, etc.

The department had offered consultancy facilities to the industries far and near in the country. Some of these are :

1. Geotechnical investigation for foundation design of proposed fly over at Sangam O.C.P (CMPDI).
2. Geotechnical investigation for foundation design of the proposed suspension bridge at Purnadih, N.K. Area, C.C.L.
3. Soil investigation for the proposed B.K. Towers at Ranchi - M & J Associate, Tharpakhna, Ranchi.

4. Soil investigation for the proposed Kalinga Apartments at Tharpakhna, Ranchi - Verma Associates.
5. Report on the soil investigation of Chandiposh Traction Substation Works of Railway Electrification, Indian Railways
6. Geotechnical investigation for Raw Water Supply from Konar River to Filter Bed at R.R. Shop, Jarangdih.
7. Geotechnical investigation for the proposed multistoried building - P. B. Enterprises.
8. Report on the Design of 900 KL R.C.C. Circular Reservoir, Biharsharif.
9. Report on Sub-surfacre investigations for the proposed Central School Complex at Ramgarh Cantt.
10. Report on Sub-surface investigation for the proposed Two R.C.C. Water Tanks to Replace Steel Tank at Ramgarh.
11. Concrete Mix Design done for
    a. M/s. Amar Construction, and
    b. Asstt. Engineer, A.G.E. B/R-I Ranchi, Dipatoli and Ramgarh.

The department handled voluminous testing of materials for the outside parties which may be categorized into the following broad divisions :

1. Laboratory determination of various properties of soil samples.
2. Field determination of bearing capacity of soil.
3. Laboratory determination of physical properties of cement.
4. Laboratory determination of compressive strength of concrete cubes.
5. Laboratory determination of compressive strenght of bricks.
6. Laboratory determination of qualities of water for various purposes.
7. Laboratory determination of various physical properties of rock samples.

Following faculty members participated in the Seminar/Workshop during the period :

1. Prof. G. Pathak has participated and chaired a Round Table Session in an International Conference held at Melbourne, Australia during 18-22 Feb., 1996.
2. Prof. G. Pathak has been appointed as a visiting scholar in the School of Civil Engineering, University of Technology, Sydney, Australia.
3. Prof. G. Pathak attended a short training course on Environmental Assessment at I.I.T., Kharagpur during 1-5 April, 1996. The course was conducted by USEPA Washington, USA.
4. Prof. V.C.S. Rao attended a conference on Rural Roads at Andhra University during 2-3 October, 1995 and presented a paper of title, "Modification of Physico-Mechanical Properties of Mine Muck".

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

During the period under review, a teacher's training programme under UGC scheme was conducted for Bihar College Teachers during July 1996. A short term course for the B.Sc.(Comp. Sc.) students of St. Columbia College, Hazaribagh was conducted during July 1996. An invited lecture on 1-Net was delivered at MECON.

Many of the final year MCA & BE students presented technical papers in many national seminars and conferences. E-Mail facility was established to get world wide linkage in June 1996.

Dr. P. K. Mahanti has gone to Philadelphia University, Amman as a visiting Professor for one year.

A project entitled, "Development of a data driven algorithm : A Heuristic search" was recommended by UGC to get financial assistance for a period of three years of amount Rs. 3,13,000/- under Dr. P. K. Mahanti as Principal Investigator.

A project for the computirisation of Coal Mines Pension Scheme, Office of the Coal Mines Provident Fund Commissioner, Dhanbad has been initiated.

The following seminars have been arranged for the benefit of final year B.E students :

1. Dr. P. K. Mahanti - Recent trends in Software Engineering, February, 1996.
2. Mr. V. K. Jain - Worldwide Technology trends in Computers, March, 1996.

The following systems have been added during 1995-96 :

a. SILICON GRAPHICS : INDY (R 4600) IMAGE PROCESSING AND MULTIMIDIA SYSTEM :
   - Processor : MIPS, R4600 PC, 100 MHz CPU
   - 64 Bit Processor based on RISC Technology
   - MIPS rating 119
   - SPECint92 - 62.8. SPECfp92 - 49.9
   - CACHE MEMORY
   - 16 KB data and 16 KB instruction cache
   - MAIN MEMORY
   - 32 MB HIGH DENSITY MEMORY
   - INPUT/OUTPUT DEVICES
   - Indycom digital colour video camera
   - Microphone and speaker
   - 101 key keyboard
   - 3 button mouse
   - 17" colour monitor (Res. 1280 x 1024)
   - INPUT/OUTPUT PORTS
   - 1 Fast SCSI Channel
   - 1 Ethernet Port with TCP/IP
   - 1 ISDN Port
   - 1 High Density cautrouics parallel port
   - 2 RS-422 serial ports
   - 2 Video impact ports : 1 composite or s-video
     1 Digital video
   - 5 Audio Ports : analog stereo in, analog stereo out, monomicrophone, stereo, headphone.
   - 2 internet GIO expansion slots

- Graphics
- 8 Bit colour planes with advance graphics features

2. 535 MB 3.5" winchester disk
3. Operating system - IRIX 5.2
   IRIX Ver. 5.2 UNIX System V.G. with 4.3 BSD and SGI enhancement.

The Silicon Graphics system is being used for study and research projects on image processing and development of various application programmes by the students.

b. WIPRO SYSTEM :

1. Pentium 90 MHz, 8 MB, 540 MB HDD. 512 KB cache, one mouse with pad & SVGA colour monitor.
2. 2 on line unix terminal VT100
3. 1 x 132 col. DMP 300 CPS
4. SCO unix O.S. + DS + MS DOS Ver. 6.22 with manuals
5. 1 no. ELNOVA make i KVA UPS System alongwith 4 nos. of SMF Batteries.

The system is being used by the P.G. Students to develop Computer Aided Geometrical design Softwares.

The students have completed a number of projects in : -

1. Library information system
2. Simulation of bulletin board system using RS-232c protocol for serial communication.
3. Virtual Telephone and voice processing
4. The Design & the implementation of hardware lock
5. Handwritten character recognition using multilayered neural network.
6. Analysis of the different techniques of improving convergency of the back propagation algorithm (based on pattern recognition using artificial neural network)
7. Parallel algorithms for finding polynomial zeros
8. Development of a software for image processing
9. An object oriented approach to development of a student information system
10. A client server model of an inventory control system using visual Basic
11. Features based online cursive script recognition
12. Development of a software for the financial appraisal of a capital project
13. Creation of a diskless node
14. Information highway on unix and windows based networked systems.

Mr. I. Mukherjee, a faculty member of the department and Mr. Anirban Mahanti, student of B.E. programme attended 10th International Conference on VLSI Design at Bangalore in January, '96.

DEPARTMENT OF ELECTRONICS & COMM. ENGG.

Theoretical Modelling and simulation of Solid State devices for high speed and optoelectronic applications have been an active area of research in the department.

During the year under report, a number of novel solid-state source detector structures for integrated optoelectronics applications have been introduced. These include Double-Heterostructure InAs/InAs Sb Light emitting diode for application in 2mm to 6mm wave-length region High Electron-Mability-Phototransistor and ION Implanted Optically Controlled field effect transistors.

A number of laboratories in the department have either been upgraded or newly introduced. Some of these are :

a. Upgraded Optical Fibre Communication Laboratory where facilities like Monochromator, Videolinks, Data links, Wavelength Divisions, Multiplexers and Demultiplexers (0.5 mw x to 25 mw) amd Optical powermeters have been added.

b. New laboratories for

   i. P C B Circuit Design and Testing, and
   ii. Digital Image Processing and Voice Synthesis Area have been added.

As a result of these newly acquired facilities, the department is able to introduce new courses in Digital Image Processing, Speech Synthesis, Microelectronic Engineering, Mobile Communication, Telecommunication Switching Circuits, Process Control Instrumentation, Computer Communication Architecture, Data Communication, Bioelectronic Instrumentation both at Under-graduate and Post-graduate level.

The Research Project entitled, "Development of Optical Fibre Communication System for Underground Mines" has been completed.

Research Project in Optical Fibre gas Sensor particularly for monitoring CO_2, NO_2, and CH_4 gas and useful in environmental pollution monitoring is in progress.

Research and Development of Laser Security Systems which have wide application in Defence is in progress.

Projects on Adaptive Control of Flight Control System and Efficient Way of handling the power factor lagging or leading loads with the help of thyristorised as controller have been initiated.

Prof. K. K. Masond, the faculty member of the department attended Seminar and presented his research paper.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGG.

The department of Electrical and Electronics Engineering is well equipped to impart training in the subject at graduate, post-graduate and Ph.D level. To keep pace with the recent development in the field, the laboratories and courses are being constantly updated. The department has introduced a new Postgraduate course in "Machine learning Process" so as to build up a strong base in Neural Networks and Fuzzy logic.

Department is offering consultancy, testing and calibration facilities to the nearby Industries and imparting specialized teaching to the students of nearby Institutions.

The department took up consultancy work and testing and calibration of instruments from various industries which is quite important these days in view of the ISO 9000 certification requirements.

In collaboration with MECON, Ranchi a consultancy project was taken up and completed for Jindal Strips, Hissar of Punjab. The project involved Spectrum Analysis of A.C. Power Source.

An off beat project "An investigation into changes in some properties of the Xylem sap of the plant" concerning conductivity, viscosity etc. has been taken up in collaboration with the Central Horticultural Experiments Station, Ranchi.

The Microprocessor Research Centre and Artificial Intelligence (A.I.) Laboratory of the department offers facility for research and various industrial projects and are upgraded from time to time to catch up with the recent developments in these areas.

During the period under review, M.Sc. students from BRABU, Muzaffarpur received Laboratory training in Robotics and AI alongwith one-month course in the subject during December 1995-January 1996 and again during June - July, 1996.

The Mobile Transfer Vehicle (MTV) project in collaboration with MECON is progressing. The software required for this project has been written and modifications required in the hardware design have been recommended to MECON. The MTV is a four wheeled robot with individual drives for each separate wheel.

A laboratory course in Electrical Machines was organised for students from National Institute of Foundry & Forge Technology, Ranchi.

DEPARTMENT OF INFORMATION SCIENCE

The department of Information Science was started in 1993-94 academic session with an objectives to provide the students with

i. an understanding and appreciation of the vital and pervasive role of information as an essential input in all developmental activities;

ii. a thorough insight into all the techniques of information handling with special emphasis on the application of information technology;

iii. full comprehension of the global nature of information for proper cooperation, corelation among the countries, and

iv. to equip the students with necessary skills in designing, implementing, operating and managing an information system pertaining to any field such as R&D, business and industry, government departments and academic institutions.

In the first batch, total 9 students were admitted and all of them are well placed in different software and information based companies. The result of second batch is also very much encouraging and most of them have got employment in various leading industries.

The department organized XIX All India National Conference of IASLIC in 1993.

Number of projects were completed by the students of the department in the field of Information Science.

Dr. U N Singh, Head of the department of Information Science attended the XX All India National Conference and was a chairperson of SIG Informetrics session at LUCKNOW, December,'95.

Ms. Rita Sinha of Library also attended the XX All India National Conference held at LUCKNOW, December,'95.

DEPARTMENT OF MANAGEMENT

In addition to the M.B.A programme offered by the department, the department is imparting necessary training in the discipline to the graduate and post-graduate students of the Institute. Department is also offering tailor made courses to the Executives of nearby organisations. During the period under report department conducted workshop on

- 'Marketing Challenges in 2000 AD, dated 13-14 January, 1996, coordinated by Prof. Awadh Prasad, Head of the Department.
- Organised B. M. Birla Memorial Lecture on 16th February, 1996 on "Steel Industry in India in 21st Century and effect of Liberation on World trade in Steel". Dr. J. J. Irani, Managing Director, TISCO, Jamshedpur was the Speaker.
- Organised correspondence course for MECON Non-technical non-executives for 6 months, started from 15th Dec. 1995 onwards, and coordinated by Prof. Awadh Prasad, Head of the Department.

Students and faculty members of the department participated in Essay competition, seminar and other developmental activities.

Mr. Sanjay Mishra, MBA student during the session 1994-95, participated and was awarded first prize in the essay competition organised on Emerging Multinational Corporation in the Indian Economy and their impact on work culture by Ranchi Productivity Council on October, 1995.

Dr. Seema Singh, Research Associate attended a summer school on Common Property Resource Management at Indian Institute of Management at Ahmedabad from 2-8 June, 1996.

Dr. Manju Bhagat was appointed Rapportier in three days Regional Seminar on Emerging Issues in Industrial Relations, Jointly organised by IIRA & IICM from 18-20 No vember, 1995 in Ranchi. She was also invited as participant and as rapportier to the three days National Seminar on Emerging Issues in Industrial Relations organised jointly by IIRA & FES, New Delhi from 2-4 April, 1996. She also attended Quality Improvement Programme organised by Humanities & Social Science (HSS), department IIT., Kanpur from 11-25 December, 1995 on Manpower Planning.

Prof. Alka Munjal was selected for "National Mahila Excellence Award to be presented in Delhi by Indian Solidarity Council.

Prof. Sharadha Shivani attended as a participant a Conference on "Managing Human Resources Contemporary, Issues held at XISS, Ranchi from 9-10 Feb., 1996.

The department is enriched with a Magna Byte Video Projector - a video cassette player cum projector costing Rs. 2.6 lacs. and the same is now being used as teaching aid.

DEPARTMENT OF MECHANICAL ENGINEERING

The department has been imparting training at Graduate and Post-graduate level. Research activity in the laboratories of the department was also being carried out and Quality Improvement of faculty members by organising seminars, lectures, short duration courses etc. was also actively pursued. To keep pace with the modern development in the field number of courses, both for graduate and post-graduate students were updated. Similarly several laboratories of the department have been modernized, notably the CAD Lab. & the I.C Engine Lab.

i. Central CAD Lab.

A central CAD Lab. has come up with WIPRO 486 system with 820 Mb memory space and Acermate 920 and 486/G with memory space of 1.2 Gb with at least thirty terminals for the use of Mechanical Engg. students. This lab has many modern software packages for the benefit of students. These packages includes the Auto CAD release 12 (drafting package). DOS as well as Window version, MCAD, FEM,FLOW, 3D STUDIO. This CAD lab has compiler of Borland C++, Turbo C, etc., too. The computer terminals are connected through modern plotter (with different pen) and printer for getting hard copy.

The Acermate 920 is the latest work station for the CAD/CAM uses with the Intel Pentium processor, PCI-local bus, Mach 64 graphics, Fast serial ports and EPP, ECP and it is ideally suited as a server for CAD lab.

The acermate 486/G has a high performance processor, on board local bus graphics controller, ping and plug technology and modular expandibility.

ii. Internal Combustion Engines Lab.

Though this laboratory of the department is well equipped but to meet the recent demands for P.C. based monitoring of engine variables, efforts have been made to procure "Indimeter 617" which is an equipment for on-line monitoring of engine variables. The same is likely to be added shortly to the existing facilities.

Number of M.E. theses work and graduate level projects have been carried out in the field of Computer Aided Design, Non-Conventional Energy and other topics. Some of these were :

i. Design & analysis of 20 KW Ocean Thermal Power Plant.
ii. Computer Aided analysis of fins.
iii. Thermodynamic analysis of gas Turbine Cogeneration Cycle with reheat.
iv. Thermodynamic analysis of gas Turbine cycle at variable ambient conditions.
v. Energy Auditing of various establishments
vi. Holography - a non-distructive Testing in Mechanical Engineering.

Research work of Mr. Arvind Kumar and Mr. R.P. Sharma under the guidance of Dr. M. N. Verma on "Development of Fuel Efficient Engine" and "Hydrogen as the fuel for I.C. Engine" is progressing satisfactorily.

This year number of seminars and special lectures were organised for the benefit of students and staff of the department. Many of the faculty members delivered these lectures on current topics in their respective field of interest.

Dr. B S Murthy, formerly a faculty member of this department and a retired Professor of I. I. T., Madras and currently Hon. Professor at Anna University visited the Institute in the 1st week of November, 1995 and delivered series of lectures in the field of energy, engines and emissions.

Mr. A. K. Jha attended the "Need Analysis Workshop" held at I I T., Kanpur from December 5-16, 1995.

DEPARTMENT OF PHARMACEUTICAL SCIENCES

During the year under report, all the disciplines of Pharmaceutical Sciences have shown significant progress and researches were carried out in all the major disciplines.

Work on the following sponsored research projects is in progress :

1. C.S.I.R. : Synthesis & Study of newer Imidazole analogues.
2. M.H.R.D. : An integrated approach towards pollution control and energy conservation through spirulina cultivation.

Research in the field of medicinal chemistry has made significant progress and a number of newer analogues of imidazole, paptides and azabicyclanes have been synthesized. The pharmacological studies of these compounds are in progress.

In the area of herbal medicines and phytochemistry, studies on antibiotic plant *Corallocarpus epigaeus* have resulted in isolation and characterization of new cucurbitacins. Studies on biological activity of these are in progress. Work has also been undertaken on widely claimed anticancer herb, *Taxus wallichiana* and the active constitutent Taxol has been detected in the leaves of the said species by HPLC technique. Investigation on local plant *Ocimum gratissimum* a variety of Tulsi are also in progress.

In the area of pharmaceutics, further work on differential Scanning Calorimeter (DSC) is continued. During preformulation development of Vitamin C containing facial cosmetics, it was observed that the concentration of most commonly used chelating agent disodium edetate is not only optimal but also critical, the phenomenon which is normally not anticipated. While conventional Accelerated Stability Testing(AST) required atleast two months to reach this conclusion, the DSC has been noticed to be a more rapid screening technique to evaluate such a criticalness on the part of the requirement for the chelating agent. Further, the utility of DSC as a rapid preformulation tool for the selection of candidate adjuvants towards solid-state formulations of piroxicam was noticed to be encouraging via the combined use of the placement and the shape and enthalpy changes in the drops lone fusion endotherm.

In further extension of work on alternative routes of administration, transdermal patches of antianginal and antihypertensive agent - Verapamil were prepared using Eudragit and Hydroxypropyl methyl cellulose. An improvement was observed in the bio-availability of the drug when used as transdermal patches in human voluntoors.

In the division of Pharmacology, the preliminary screening, toxicological and biochemical studies of synthetic and natural medicinals are being carried out.

Two Doctoral Theses were submitted by the students of the department. These are :

1. A. K. Tiwari - "The Influence of Crystal habit on the formulation of Cotrimoxazole suspensions" Supervisor - Dr. G. M. Panpalia,
2. S.S. Mahli - "Pharmacological Studies on Purified Pongamia seed oil, Karanjih, Pongamol and their derivatives". Supervisor - Dr. S. P. Basu

For the benefit of students and staff, department arranged two extension lectures :

1. Prof. (Ms.) Malay Gupta of Jadavpur University, calcutta delivered a lecture on "An Overview of Psychopharmacological agents".
2. Dr. D K Moza, Pharmaceutical Consultant, calcutta spoke on "GMP in Pharmaceutical industry".

Following faculty members attended workshop/congress organised by the various organisations. These are :

1. Dr. A. K. Sharma - "Diseases and Healthcare Map of India" National Atlas & Thematic Mapping Organisation, (DST), Calcutta, November 1995.
2. Dr. A. K. Sharma - "National Workshop on Planning and Management of Pharmacy education in India sponsored by AICTE", Punjab University, Chandigarh, 1995.
3. Dr. S. Jha - "Standardization and Quality Control of Herbal Drugs", Regional Research laboratory, Jammu, Feb. 1996.
4. Dr. A. K. Sharma attended 47th Indian Pharmaceutical Congress, Visakhapatnam, Dec. 1995.
5. Dr. S. P. Basu attended 47th Indian Pharmaceutical Congress held at Visakhapatnam in Dec. 1995. and presented his research papers.
6. Prof. S. P. Bhatnagar attended and participated at the "Workshop on Forestry Extension Strategies and E.S.F." held at F.R.I., Dehradun on 12-13 June 96.

The department has been enriched with High Performance Liquid Chromatograph (HPLC), a highly sophisticated analytical tool with multidisciplinary applications.

The department has been collaborating with Central Drug Research Institute, Lucknow and Regional Research Laboratory, Jammu on number of research projects in Pharmaceutics and Medicinal Chemistry.

Dr. S. P. Basu has been elected as a member of Experts Panel on Drug and Pharmaceuticals by AICTE, New Delhi.

During the period under review there has been a cent-percent placement of our graduates through campus interviews.

DEPARTMENT OF POLYMER ENGINEERING

During the period 1995-96, the newly established Polymer Engineering department worked towards organising the 4 years under-graduate course leading to B.E.(Polymer Engineering).

The department has established Polymer Engineering workshop with the following facilities :

Injection Moulding, Blow Moulding, Compression Moulding, Thermoforming, Fibre Reinforced Plastics Fabrication, Melt Flow Indexing etc. This facility was availed of by undergraduate engineering students as a part of workshop practice and manufacturing process courses. The facility was also utilised for undergraduate project work in Production Engineering department.

In collaboration with BIT-STEP, the department is implementing a DST, Govt. of India, sponsored project, "Skill Development and Entrepreneurship promotion in Plastics Processing". Under this scheme four short term courses of three months duration each are being conducted. In each programme ten candidates are being trained in the field of plastics processing. The aim of the project is to create awareness amongst entrepreneurs so that they can start new plastics processing unit. The course has already been widely acclaimed and is likely to be continued. A proposal to continue this programme, for further three years, has already been submitted to Govt. of India.

Mukherjee, M. delivered a lecture on "Engineering Thermoplastics" in a short term course on "Materials Science" organised by Institution of Engineers (India), Ranchi Chapter in September, 1995.

Mukherjee, M. received 1995 Sisir Kumar Mitra Memorial award of Indian Institute of Chemical Engineers for the second best technical paper published in 1994 issues of Indian Chemical Engineer for her paper "Leaching of Roasted Zinc Ore in rotating disc contactors".

DEPARTMENT OF PRODUCTION ENGINEERING

In addition to UG and PG programmes, the department has been actively engaged in research activities. During the period under review, three students have completed ME these in various fields. Notable among them being the Scenario and Configuration Development for the manufacture of Idlers and rollers of Belt Conveyors and Total Quality Management for manufacture of ferro Alloys.

The faculty members of the department are also actively engaged in the research work. The following areas are of their interest :

1. Ergonomics of systems/Workstation design
2. Skill based flexible automation
3. Forging of Sintered Preforms

4. Manufacturing Tribology
5. Plant layout and Manufacturing - Resource Planning
6. TQM and ISO 9000 Quality systems
7. Reverse Engineering.

Dr. A. B. Abdulla of the Aden University, Republic of Yemen, delivered a talk on development of Expert systems in Manufacturing Engineering on September 29, 1995.

Dr. A. K. Jha of B.H.U., Varanasi delivered a talk on Strategic Approach to Total Quality Management on November 21, 1995.

Mr. Samaresh Sharan of Institute of Information Technology (TROY, (M.I)), USA conducted workshop on the following topics during January 11-12, 1996:

- JIT Manufacturing and KANBAN System
- Robots in Factory Automation
- Business Process Re-engineering

The establishment and development of the following laboratories are in progress :

Forming Laboratory, Machine Tool Automation Lab., Tool Room and Manufacturing Tribology and the following equipments were added during the period :

1. Surtronic 4+ Surface Measuring Instrument.
2. Wear and Friction Monitor
3. Body Dynamics Model - 310
4. Digital Temp. Humidity and Daw point Monitor
5. Permeability Meter
6. Rapid Moisture Tester
7. Mould Hardness Tester

DEPARTMENT OF SPACE ENGG. & ROCKETRY

In addition to the usual academic programme, the department has created many excellent experimental facilities which are being utilized by various departments of the Institute. Some of these are :

a. Experimental setups for Fabrelcatlon of Composite materials

b. Wind Tunnel Facility

c. Pressure Differential Scanning Calorimeter (D.S.C)

d. Flame Propagation Stability Unit

Research interest during the year under report mainly were in the field of Aero dynamics, Propellant and Rocket propulsion and Composite materials. These can be summarised as :

A. Aerodynamics Division

1. Low Speed Unsteady Aerodynamics

Studies were carried out to obtain unsteady air load on a "Finite Wing" comprised of NACA 0012 section both in the damaged and undamaged condition of the leading edge over a wide range of angles of attack. The mean surface pressure distribution and r.m.s variations in surface static and total pressure were obtained by an indigeneously developed measuring technique. Also r.m.s angular deviations in the near wake measured by another suitably developed technique proved effective in obtaining unsteady air load on the wing.

2. High Speed Unsteady Aerodynamics

In the shock wave-boundary layer interaction zone, the flow field is reported to be highly unsteady. As a follow up, studies were carried out on ramp surfaces in supersonic stream at a nominal Mach No. 2.25 Attempt was made to obtain mean surface pressure and r.m.s levels in surface static and total pressures effectively by indigeneously developed measuring techniques. The studies confirm r.m.s levels in wall pressures of several hundred percent in the separated zone of shockwave and boundary layer interaction.

B. Propellant and Rocket Propulsion Division

1. Research on High Energy Gelled Propellants

The research and development work in the area of high energy gelled propellants utilizing Monomethyl Hydrazine (MMH)/Aluminium fuel system is being carried out under an ISRO sponsored research project. The fuel system developed under this programme seem to be quite attractive for application in satellite thrusters and high performance liquid rocket engines. ISRO is currently using the base fuel, MMH in its launch vehicles. The newly developed heterogeneous fuel systems have been found to exhibit excellent application characteristics. The studies on their performance evaluation under different rocket engine operating conditions are in progress.

2. Development of Fuel Rich Propellants

Modern missile systems are gearing up to meet very high velocity, range, manoeuverability and fast response time requirements. For this reason, advanced missiles have to be light weight, sleek and high performing. The concept of employing integral rocket ramjet (IRR) engine using fuel rich propellants (FRPs) in modern missiles, is an attractive approach to realise these demanding mission requirements. The ramrockets require an oxygen deficient solid propellant which burns within a primary combustion chamber and its fuel rich combustion products are exhausted into a secondary combustion chamber where they mix and after burn with ram-air supplied by the air intakes.

Efforts have successfully been made to formulate a suitable fuel rich propellant with good after burning characteristics. The newly developed dinitroso penta methylene tetramine (DNPT) pyrolysable fuel polymer has shown self sustainable combustion at very low oxidizer loadings. The fuel rich compositions using DNPT, Ammonium Perchlorate, HTPB and Magnesium have been optimized for good processability and ballistic performance. The theoretical over all specific impulse, a rocket performance parameter, has been found to be 745 sec. at an Air-fuel ratio 15, which is more than three times in comparison to a conventional solid rocket motor.

3. Studies on Burn Rate Modifiers

A novel approach, by using mixed burn rate modifiers, has been attempted to assess the changes in FRP burn rates. It has been observed that the propellant compositions containing ferrocene catalyst alone, show a reduction in burn rate at elevated pressure (50 bar). However, the noteworthy feature of this study is that the addition of a small percentage of cuprous oxide in the composition removes the mean trend and ensures linear dependence of burn rate with operating chamber pressure even in higher domains. This finding will have a significant bearing on the future combustion and internal ballistic research of solid rocket motors.

C. Composite Materials

Research work has been done to study the environmental effect on the flexural fatigue behaviour of Carbon/Epoxy Composites with a central circular holes of different diameters. The specimens were fabricated with help of vaccum bag techniques with an average fibre volume fraction 57 percent. The specimens were exposed to tap water, saline water, acidic solution and low temperature prior to fatigue tests.

The specimen having ASTM specifications were subjected to fatigue tests on a rotary bend test with complete reversal of cyclic loading. The thickness of the specimen and frequency of load application on test machine were kept constant.

The experimental results have revealed that the fatigue strength decreases due to any of the environmental exposure condition. Further, the reduction in fatigue strength with increase in cavity size has also been observed in each environment.

Modernisation of Rocket Propulsion Laboratory

The rocket propulsion laboratory is being modernised under an AICTE funded MODROBS programme. The control room used for static solid and hybrid rocket test firings has been renovated. The work on installing the computers for firing controls, data acquisition, analysis and storage is under progress. The new facility also has the provision for sound and video recordings during firings. The simultaneous acquisition and display of pressure - time and thrust - time curves obtained during the static test firing will be accomplished. The necessary software for computing the rocket performance parameters is being developed.

Five students have submitted their M.E theses under the guidance of faculty members of the department and a Scholar, Mr. Ramakant Singh of the department was awarded Ph.D. Degree during the period. He worked under the guidance of Dr. A K Shrivastava on the topic,"Studies on Elastic Buckling of Composite Plates". Research work of two Ph.D scholars is progressing well.

Work on 4 sponsored project is satisfactorily progressing and 4 new project proposals are under active consideration of the sponsoring agencies. The details of these sponsored projects and proposals are :

ONGOING PROJECTS

1. Name of the Project - Development Studies on Gelled Monomethyl Hydrazine (MMH) Propellant

	Agency	-	I S R O
	Name of Investigators	-	Dr. Mohan Verma Dr. B. L. Gupta
	Aim of Project	-	To develop thixotropic gels of MMH and study its combustion behaviour & flow properties & its performance
2.	Name of the Project	-	Experimental Studies on Fatigue of Carbon Fibre Reinforced Composite Under Adverse Environmental Conditions
	Agency	-	Defence AR & DB
	Name of Investigators	-	Dr. A. K. Shrivastava
	Aim of Project	-	Fatigue studies on composite reinforced materials under different environmental conditions are being carried out.
3.	Name of the Project	-	Experimental Studies on Elastic Buckling of Glass/Epoxy Composite Plates Under Thermal Loading
	Agency	-	Min. of H.R.D.
	Name of Investigators	-	Dr. A. K. Shrivastava
	Aim of Project	-	To study the Buckling Strength of Glass/Epoxy composite plates at different temperatures.
4.	Name of the Project	-	Modernization of Rocket Propulsion Laboratory
	Agency	-	Min. of H.R.D. (AICTE)
	Name of Investigators	-	Dr. A. K. Chatterjee Dr. Mohan Verma
	Aim of Project	-	To build up the necessary infrastructure for recording and analysing the performance of solid & hybrid rocket motors.
	<u>New Project proposals</u>	-	under active consideration of sponsoring agencies :
1.	Name of Project	-	Transonic Buffeting : Shock Boundary layer Interaction
	Agency	-	ISRO
	Name of Investigators	-	Dr. J. N. Mishra
2.	Name of Project	-	Development of CFD scheme for Flow Field Modelling around Lauch Vehicle : A 3-D Analysis
	Agency	-	ISRO
	Name of Investigators	-	Dr. J. N. Mishra
3.	Name of the Project	-	Development of Fast Burning HTPB Based Composite Solid Propellants
	Agency	-	Defence AR & DB
	Name of Investigators	-	Dr. B. L. Gupta Dr. Mohan Verma

4. Name of the Project - Fatigue Behaviour of Adhesive Lap Joints
   Agency - Defence AR & DB
   Name of Investigators - Dr. A. K. Shrivastava

Dr. Alexander G. Prokhrov, Deputy Director for International Cooperation, S.S.A.U. and Dr. Valentin G. Shakhov, Professor & Head of Aerohydrodynamic Department, S.S.A.U. visited BIT., Mesra, Ranchi (India) during October 14-17, 1995. The Russian Professors apprised us about the facilities and R&D activities in their respective Universities. The Russian team visited this and other departments of the Institute. During their stay, they delivered a series of lectures as per details given below :

1. Tensors Methods in the Boundary Layer Theory - Dr. Valentin G. Shakhov
2. Russian Space Investigation - Dr. Alexander G. Prokhrov
3. Some Problems in Laminar Boundary Layers - Dr. Valentin G. Shakhov
4. Linear Discrete Model of Crack Propagation - Dr. Alexander G. Prophrov
5. Higher Education in Russia - Dr. Alexander G. Prokhrov
6. A lecture "Propulsion Scenario" was delivered by Dr. B.N. Sreedhar, Professor, deptt. of Aerospace Engg., IIT Kharagpur on March 3, 1996 in the Seminar Hall of this department.
7. A lecture "Open Loop Satellite Attitude Stabilization through Tether" was delivered by Dr. Krishna Kumar, Professor & Head, Deptt. of Aerospace Engg., IIT Kanpur on April 22, 1996 in the Seminar Hall of this department.

Faculty members of the department were also invited by other Institutions to deliver lectures. These are :

1. Dr. Mohan Verma delivered an invited talk on "High Energy Materials Research Scenario" under the auspice of Vikram Sarabhai Space Centre and High Energy Materials Society of India, October 12, 1995 at VSSC.
2. Dr. J N Mishra delivered an invited talk on "Unsteady Aerodynamics" at the Aerodynamics & Flight Mechanics Divisions of Vikram Sarabhai Space Centre, Trivandrum, January 23, 1996.
3. Dr. A. K. Chatterjee delivered a Lecture on Materials for Aerospace, entitled "Astronautics, Space Vehicles and Structural Materials" in the Short Term Course on "Materials Science" September 21-12, 1995 at the Institution of Engineers (I), Ranchi Local Centre.
4. Dr. A. K. Chatterjee gave a talk on "Integrated Missile Development Programme of India" on 28 January, 1996 at the Institution of Engineers (I), Ranchi Local Centre and Dr. A. K. Chatterjee conducted a Short Term Course on "Materials Handling: A Systems Approach", May 17-19, 1995 at the Institution of Engineers (I), Ranchi Local Centre.

   Dr. J. N. Mishra has filed 3 patent application with the Controller of Patents, Govt. of India.

DEPARTMENT OF APPLIED CHEMISTRY

In addition to academic programmes, the department has been undertaking consultancy and material testing work.

Following projects are sanctioned to the faculty members of the department :

1. M. Verma & B.L. Gupta, "Development Studies on Gelled Monomothyl Hydrazine (MMM) Propellant".
2. P. K. Srivastava, "Environmental Degradation and Stabilization of Plastics".

The Ph.D. work of Prof. B. D. Choubay on "Physiocochemical study of Coordinated Malonic Acid and similar Compounds" is smoothly progressing. Dr (Mrs.) Usha Jha, a faculty member has delivered a series of lectures on "Environmental Pollution" at Bihar Industrial Research Development Centre, Ranchi. Dr. (Mrs.) Usha Jha had also acted as an Expert on "Forest Tribal Interface", a training programme conducted for Senior Forest Officers from different states at the Society for Rural Industrialization, Ranchi on November 16, 1995. She has also presented a research paper at the IIIrd International Conference on "Environmental Planning and Management" held at VRCE, Nagpur during 24-26th February,'96.

Nephelometer, an equipment has been added in the department during 1995-96.

DEPARTMENT OF APPLIED MATHEMATICS

The department is participating in Under-graduate and Post-graduate programmes of Engineering and Science disciplines. The department is also actively engaged in research work in the following interdisciplinary areas :

i. Elasto-plastic dynamics with special emphasis on Manufacturing Process.
ii. Elastic vibrations with reference to micro-structure of engineering components.
iii. Elasto-dynamics with emphasis on seismology
iv. Boundary Layer Theory
v. Magneto-fluid dynamics

Elasto-plastic progressive deformation under the heading 'Unconventional Forming Process' is under study. These investigations will provide an aid to the development of commercial forming process. Results so far obtained are encouraging from the point of view of industrial applications.

In the areas of magneto-fluid dynamics efforts are under way to study unsteady second grade MHD fluid flow.

In the areas of boundary layer theory, efforts are being made to study steady non-stationary compressible laminar boundary layer with vectored mass transfer. Investigations are also underway to solve 'Inverse Problem' in the study of boundary layer theory.

The future plan and programmes of the department includes :

i. A research project on Rotating Viscous Plasma in crossed fields.
ii. Numerical Computation for the problem 'Steady non-similar compress ible laminar boundary layer flows with vectored mass transfer.
iii. Inverse Problems in Boundary Layer Theory.

Dr. Satyajit Ray and Dr. C. Thakur, two of the faculty members of the department attended Seminar/Workshop and presented papers this year.

DEPARTMENT OF APPLIED PHYSICS

The Applied Physics laboratories are being further developed by including new experiments on Materials Science, Plasma Physics and Optical Data Processing. The sophisticated instruments - Mossbauer Spectrometer and Atomic Absorption Spectrophotometer are the new additions in the department.

The faculty members are actively engaged in doing research in the thrust areas like Ultrashort Pulse Generation techniques, Optical Data Processing, Plasma Physics and Studies on Superconductivity materials and Multilayer surface coating. Faculty members are also taking active part in popularising Science.

A Seminar on 'Recent Trends in development of Optical Amplifiers for Communication' was held on 19.9.95 for the benefit of staff and students of the Institute. Dr. K. P. J. Reddy from Indian Institute of Science, Bangalore was the main Speaker.

Following two projects, one sponsored by D.S.T., Govt. of India and the other sponsored by I.S.R.O., Govt. of India are progressing satisfactorily at the Plasma Laboratories.

1. 'Study of Arc Plasma Characteristics of a cascaded Arc Plasma Gen erator' sponsored by Department of Science and Technology, Govt. of India, New Delhi under SRPP. with the Principal Investigator - Dr. P. K. Barhai Studies on - Current Voltage Characteristics at different gas flow rates and input currents are completed and Studies on Efficiency of the generator, Heat flux using calorimetric principle and plasma parameters (electron density, electron temperature etc.) using optical emission spectroscopy are in progress.
2. Metallic Multilayer Surface Coating Using Anodic Vaccum Arc' sponsored by I.S.R.O., Govt. of India, Bangalore under the Principal Investigator - Dr. P. K. Barhai Special Vaccum chamber has been designed and Hind High vaccum (HHV), Bangalore has agreed to fabricate the same under our supervision. Further studies are in progress.

Dr. R. K. Popli attended 2nd Congress on Traditional Sciences and Technologies of India held in December 1995 at Madras.

PARTCIPATION OF FACULTY IN NATIONAL/INTERNATIONAL SEMINAR CONFERENCES/SEMINARS/WORKSHOPS.

DEPARTMENT OF CIVIL ENGINEERING

1. Prof. G. Pathak :
   a. International Conference held at Melbourne, Australia (Feb 18-22, 1996)
   b. Environmental Assessment at IIT., Kharagpur (1-5th April, 1996)
2. Prof. V. C. S. Rao : Conference on Rural Road - Andhra University (2- 3 Oct., 1995)

DEPARTMENT OF ELECTRONICS & COMMUNICATION

1. Prof. S K Ghorai :

   XXII National Symposium of the Optical Society of India, March, 1996.

2. Prof. S K Masand :

   Summer School (EMI-EMC Compatability), I I T., Kharagpur, 1996.

DEPARTMENT OF INFORMATION SCIENCE

1. Dr. U N Singh :

   XX All India Conference of Information Science, Lucknow, December, 1995

2. Ms. Rita Sinha :

   XX All India Conference of Information Science, Lucknow, December, 1995

DEPARTMENT OF MANAGEMENT

1. Dr. Seema Singh :

   Summer School on Common Property Resource Management at I. I. M., Ahmedabad (2-8th June, 1996)

2. Dr. Manju Bhagat :

   a. Regional Seminar on Emerging Issues in Industrial Relations held at Ranchi (18-20th Nov.,'95)

   b. National Seminar on Emerging Issues in Industrial Relations held at New Delhi (2-4th April, 1996)

   c. Winter School (Q.I.P) on Manpower Planning, I I T., Kharagpur (11 - 25th Dec., 1995)

3. Prof. Shardha Shivani :

   Conference on Managing Human Resources Contemporary Issues held at Ranchi (9-10 Feb., 1996)

DEPARTMENT OF PHARMACEUTICAL SCIENCES

1. Dr. A. K. Sharma :

   a. "Diseases and Health care Map of India" organised by National Atlas & Thematic Mapping Organisation (DST), Calcutta, November, 1995

   b. "National Workshop on Planning and Management of Pharmacy Education" Punjab University, Chandigarh, 1995

   c. Indian pharmaceutical Congress, Visakhapatnam, December, 1995

2. Dr. S. P. Basu :

   47th Indian pharmaceutical Congress held at visakhapatnam, Dec. 1995.

4. Dr. S. Jha :

   "Standardisation and Quality Control of Herbal Drugs" held at R R L., Jammu, February, 1996

4. Prof. S P Bhatnagar :

   "Workshop on Forestry Extension Strategies and ESF" held at F R I., Dehra Dun, June, 1996.

DEPARTMENT OF MECHANICAL ENGINEERING

1. Mr. A K Jha : "Need Analysis Workshop" held at I I T., Kanpur (5-16th Dec., 1995)

RESEARCH PAPERS, BOOKS, ARTICLES PUBLISHED OR ACCEPTED FOR PUBLICATIONS

DEPARTMENT OF CIVIL ENGINEERING

1. Prof. V.C.S. Rao "Computer Aided Analysis of Berthing Structure" - Proceedings of 3rd ASIA-PACIFIC Conference on Structural Engineering and Construction, Malaysia, 17-19 June, P. 155-167, 1996.
2. Prof. V.C.S. Rao "Analysis of Deep Excavations by using FEM" - Proceedings of Indian Geotechnical Conference, Anna University, Madras, December, 1995.

DEPARTMENT OF COMPUTER SCIENCE

1. Jha, J, Mahanti, P K, Sahoo, L, Mukherjee, I "Elements of Computer Science", Narosa Publishing House, New Delhi, 1996.
2. Jana, P K "Design of a Linear Array for Generating Discrete Orthogonal Polynomials" Proceedings in the National Symposium on Retca, March 8-9, Punjab, 1996.
3. Mahanti, Anirban, et. al. "A new formula to calculate average time for QUICKSORT", Vol. 32, Analysis & Modelling, pp 55-58, AMSE PRESS, FRANCE, 1996.
4. Mahanti, Anirban, et. al. "A low cost concentrator based network - A new implementation" Proc. of Educomp'96, TTTI, Chandigarh, India, March 19-22, 1996.
5. Mahanti, Anirban, et. al. "An algorithm for in-memory reversal of an one-way I inked list", Proc. of CTICIS, pp. 99-111, Philadelphia Univ., Amman, Jordan, July 9-10, 1996.
6. Mahanti, Anirban, et. al. "Caught in the nets of Internet", Jordan Times, Jordan, April 13, 1996.
7. Mahanti, Anirban, et. al. "Year 2000-the problem and solution", Jordan Times, Jordan, June 30, 1996.

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGG.

1. "Elements of Electronic Instrumentation" by J. Jha, M. Puri, R. Sukesh Kumar and M. Kowar, Narosa Publishing House, New Delhi, 1996.
2. M. K. Kowar, et. al., "Modelling of Silicon epitaxy using silicon tetrachloride as the source", Microelectronics Journal, Vol-26, PP 507-514, 1995.
3. D. K. Routray, "Double Frequency Modelling of an ION-Implanted Optically Con trolled Field Effect Transistor" - Communicated.

DEPARTMENT OF APPLIED MATHEMATICS

1. Prasad, S. C. & Roy, S. S., "Couple Stress Concentration around a circular hole in an infinite micropolar thermo-elastic plate" - Communicated.
2. Thakur Chandreshwar : "An exact solution of Steady Plane Orthogonal MHD flows", presented at the 40th ISTAM Congress, Bhopal, Dec. 1995.

3. Ray, Satyajit, presented a paper entitled "Unsteady Laminar Compressible Swirling flow with vectored mass transfer" at the 40th ISTAM Congress held at Bhopal, Dec. 1995.

DEPARTMENT OF APPLIED PHYSICS

1. Keshri S., Barhai P. K. : "Studies of thermodynamic fluctuations of thermoelectric power of Tl_2Ba_2 $Ca_{0.8}$ $Cu_{0.2}$ O_{8+y} superconductor" - Communicated.
2. Keshri S., Barhai P. K. : "Thermoelectric Power of High-T superconductors Using Extended Hubbard Model" - Communicated.
3. Rakesh Popli, et al, "Science Orientation of Children in Elementary Education" - Communicated.
4. Rakesh Popli, "Traditional Indian Sciences : Role in Making General Science Education wholesome and Purposeful", Proc. of 3rd Congress on Trad. Indian S & T, Madras, p.12.4, 1995.
5. Rakesh Popli : "Akash Darshan Ka Anand", "Rahu-Ketu Ki Khoj", "Khoya Hua Janmadin" - These booklets are in Hindi and published by Vigyan Prasar, New Delhi, 1995.
6. G. Gamow and Rakesh Popli, "Ek, Do, Teen .... Anant" (revised and updated Hindi version of English original), Vigyan Prasar (in press).
7. Rakesh Popli - Popular Science articles on eclipse, surface capillary action on milk and science education in daily newspaper - Prabhat Khabar.
8. Rakesh Popli, "Science Literacy : Different approaches and visions of Society" - Communicated.
9. Rakesh Popli, "A Rather Dogmatic Debate on Scientific Temper" -Communicated.
10. Rakesh Popli, "Slippery Points in Curved spaces" - Communicated.

DEPARTMENT OF PRODUCTION ENGINEERING

1. Singh, B. K., Sasmal, D, and Sinha, K.P. "Work design for heavy and moderately heavy workloads" Journal of IE(I) Prod. Engg. Div., Vol. 77, pp. 20-22, May'96.
2. Sutradhar, G., Jha, A. K., Kumar, Surender "Cold Forging of Sintered Polygonal Discs", J of IE (I), Vol. 76, pp-148-152, Nov.'95.
3. Sutradhar, G., Balswan, A.A., Kumar, S "Development of Sintered Forged Products" Industrial Products Finder, pp. 244-246, April,'96.
4. Sutradhar, G., Kumar, S "Deformation of Solid Powder Discs under Lubricated conditions", Proc. Tribo-Tech, pp. 348-361, Feb.'96.

DEPARTMENT OF SPACE ENGG. & ROCKETRY

1. Ashish Jain & J N Mishra, 'Effect of Leading Edge Damages on Flow Parameters of a Finite Wing", Journal of Institution of Engineers, Vol. 76, pp. 9-14, Sept., 1995.
2. R R Reddy & J N Mishra, "Effect of Cross Stream Riblet on Flow Field Parameters", Journal of Institution of Engineers, Vol. 76, pp. 69-73, March, 1996.
3. Varma, Mohan, Gupta, B L. and Pandey, M. "Formulation and Storage Studies on Hydrazine Based Gelled Propellants", International Seminar on High Energy Materials, - Accepted, 1996.

The following **patent** applications of Dr. J N Mishra (Aerodynamic Division) have been filed with the Controller of Patents, Govt. of India, Calcutta :

1. 911/Cal/95 Dated August 7, relating to "Add/sub Mechanical Probe to Measure Flow Unsteadiness and Reynolds Stresses in Highly Unsteady Flow Fields", 1995.
2. 912/Cal/95 dated August 7, 1996 relating to "M.S Mechanical Probe to Measure Angular Deviations and Unsteady Angle of Attack in Highly Unsteady Flow-Fields/ Wakes of Lifting Bodies".
3. 1028/Cal/95 dated August 29, 1995 relating to "Mechanical High Speed M H Compound Deviation Meter".

DEPARTMENT OF PHARMACEUTICAL SCIENCES

1. R. Kulshrestha, G. M. Panpalia and U V Banakar "Effect of phase inversion on physical stability of o/w emulsions", Int. J. Pharm. Adv., 1, 73 9, 1995.
2. B N Sinha, J. Thanigavelan, S P Basu and E Sukumar "Studies on Melothria maderasapatana (Linn.) Cogn", Ancient Science of Life, 15 238, 1996.
3. D Sasmal, B Srivastava, and S P Basu "Effect of Pongamol and its derivatives on Serotonin, GABA and Glutamine levels in mice brain" - Communicated.
4. P R P Verma and T E G K. Murthy "Controlled Transdermal delivery of Flurbiprofen films using mixed grades of Eudragit, design, in vitro and in vivo evaluation", Int. Pharm. Adv., 1, 39, 1996.
5. P. R. P. Verma and V Banu Sustained release of Theophylline from Eudragit and RLPO, RSPO tablets", Drug Dev. Ind. Pharm., in Press.
6. P. R. P. Verma, T. E. G. K. Murthy and V Ramesh "Computer simulation of in vitro drug release data and its kinetic interpretation", Ind. J. Pharm. Sci., 3 124 (1996)
7. P. R. P. Verma, A Keshri and C M Prasad "Further Studies on Chemical evaluation of Ayurvedic Drug Lauha Bhasma III, Ancient Sci. Life, in Press.
8. P. R. P. Verma and T. E. G. K. Murthy "Transdermal flurbiprofen delivery using HPMC matrics : Design, in vitro and in vivo evaluation" - Communicated.
9. P. R. P. Verma and R K Patel "Transdermal delivery of Verapamil using HPMC matrices Design, in vitro and in vivo evaluation" - Communicated.
10. B. N. Sinha, S Asokan and S P Basu "Report on Few Cucurbitacins from Coralocarpus epigaous", Proceedings of 47th Ind. Pharm. Congress,Vishakapatnam, 1995.
11. S. P. Basu, S. S. Mahli, D Sasmal and M Gupta "Effects of Purified Pongamia seed oil on reproduction n albino rats", Proceedings of 47th Ind. Pharm. Congress, Vishakapatnam, 1995.
12. T. Roychoudhury, J. Mahapatra, A Prasad and S P Basu "Problems and Prospects of Marketing of Drugs Manufactured by Small Scale Industries", Proceed ings of 47th Ind. Pharm. Congress, Vishakapatnam, 1995.
13. G. M. Panpalia, P Das and K Chandrasekhar "Ciprofloxacin hydrochloride solid-state preformulation rapid screening through DSC", Proceedings of 47th Ind. Pharm. Congress, Vishakapatnam, 1995.

14. G M Panpalia, M V Dasture and J Rungta "Vitamin C-Disodium edetate interaction mediated drug degradation", Proceedings of 47th Ind. Pharm. congress, Vishakapatnam, 1995.

15. V. Loganathan and G. M. Panpalia "Influence of the nature of internal phase on the stability of o/w emulsions through zeta potential", Proceedings of 47th Ind. Pharm. Congress, Vishakapatnam, 1995.

16. S Samanta "Synthesis and hepatoprotective study of the peptides glycyl-glycine and glycyl-glutamic acid against paracetamol", Proceedings of 47th Ind. Pharm. Congress, Vishakapatnam, 1995.

17. P. R. P. Verma and T. E. G. K. Murthy "Transdermal delivery of Flurbiprofen I", Proceedings of 3rd US-Japan Symposium on Drug delivery, Maui, Hawaii, 1995.

18. P. R. P. Verma & T. E. G. K. Murthy "Transdermal delivery of flurbiprofen II", Proceedings of 3rd US-Japan Symposium on Drug delivery, Maui, Hawaii, 1995.

19. P. R. P. Verma, S. John, N. Kulshrestha and S. Choudhury "Studies on Commercial tablets of Chlorpropamide and Tinidazole", Proceedings of 47th Ind. Pharm. Congress, Vishakapatnam, 1995.

20. P. R. P. Verma, P. R. Pant and A. Padhvia "In vitro evaluation of commercial antacid formulations", Proceedings of 47th Indian Pharm. Congress, Vishakapatnam, 1995.

21. P. R. P. Verma and R. K. Patel "Design and evaluation of Verapamil transdermal formulation", Proceedings of 47th Indian Pharm. Congress, Vishakapatnam, 1995.

22. A Cendil Kumar, B. S. Patil and A. K. Sharma "Synthesis and biological activities of 3, 10-diazabicyclo [4.4.1] decane and its analogues", Proceedings of 47th Indian Pharm. Congress, Vishakapatnam, 1995.

23. V Arya, S. K. Mishra and A. K. Sharma "Dacterial resistance to various antimicrobials : a Current status", Proceedings of Indian Pharm. Congress, Vishakapatnam, 1995.

DEPARTMENT OF INFORMATION SCIENCE

1. U. N. Singh and K. N. Jha "Intellectual property right in the post-industrial society : An overview", Proceedings of XVII All India National Seminar held at Calcutta

2. U. N. Singh, Rita Sinha and K. N. Jha "Globalisation of local S & T Information through indigenous databases and networking".

SCHOLARS REGISTERED FOR Ph.D

During the year 1995-96 one scholar has completed his research qualifying for the award of Ph.D. Seven new scholars have registered for Ph.D. programme in the subjects/ areas of their study as stated below :

S.No.	Name of Scholar	Title of Thesis
1.	Shri S. A. Siddiqui	Technological Aspects for Improving Productivity of a Forge Industry.

2.	Shri M. Gopal Krishna	Artificial Neural Networks applied to Rolling Mills.
3.	Shri. S. K. Madanpuri	Application of Fuzzy and Expert Systems to Telecommunication.
4.	Shri. P. N. Prasad	Studies on some indegenous seed oil for possible utilization in pharmacy.
5.	Shri S. Samanta	Synthesis & studies on piperidine Analogs.
6.	Shri P. R. P. Verma	Studies on Pharmaceutical uses of some seed Gums.
7.	Shri Deepak M.	Standarization of Herbal Drugs.

Besides the above, the following 34 scholars were registered for their Ph.D. in the previous year(s); they are continuing the work under the guidance of the respective Doctoral Committees :

1.	Shri Rajendra Prasad	Quality System for Guided Weapon Systems.
2.	Shri Pramod Kumar Dash	Experimental Studies on Fatigue of Glass and Carbon Fibre Reinforced composites under Adverse Environ - mental Conditions.
3.	Shri B. D. Choubey	Physio-Chemical study of co-ordinaed Malonic Acid and similar Compounds.
4.	Mrs. Sunita Keshri	Study of Oxide Superconductors with high transition temperatures.
5.	Mrs. Aruna Jain	Study of Non-equilibrium Plasmas.
6.	Shri K. R. Roy Choudhary	Buckling of Laminated Composite Plates.
7.	Shri Binay Kr. Singh	Influence of Adverse Environmental Conditions on Elastic Buckling of Com- posite Columns.
8.	Shri Amit Jana	Theoretical Modelling of Heterounction field Effect Transistor for high speed and Opto-Electronics Applications.
9.	Shri S. K. Datta	Some Theoretical studies on Optically controlled Microwave Semi-conductor Devices.
10.	Shri A. K. Mishra	Some Experimental Studies on Environ mental Pollution due to Diesel Engine Exhaust.
11.	Shri S. N. Thakur	Castability, Forge-ability, Mechinability and Fracture behaviour of Alluminium silicon Alloys.

12.	Shri Sudhir Sharan	Computer based Analysis & Modelling for Integrated Working Capital Management.
13.	Shri R. S. Yadav	Impact of Physical Training on Managerial Effectiveness - a case study of some Institutions and Organisations.
14.	Shri Pawan Kumar Rai	Solid Waste Management in Steel Plants for improved Environment.
15.	Shri Taposh Kumar Roy	Problems and Prospects of Marketing of Drug Manufactured by Small Scale Industries.
16.	Shri Goutam Sutradhar	Development of Forged Components using Sintered Preforms.
17.	Shri M. Adiraj	Synthesis and use of Methyl Phosphonate containing Oligonucleotides for the study of B - Z DNA Transition.
18.	Shri B. K. Mishra	Computer Aided Modelling of SolidState Photodetector.
19.	Shri Durgesh Pant	A complete study of Reconfigurable Computer Systems.
20.	Shri Prasant Kr. Mukherjee	Quadratic Sruds and Methods of Approximating them in Ancient and Mediaeval Mathematics.
21.	Ms. Sandhya Rani	Study of some Chemical aspects of stress induced Magnetic & Electromagnetic Effects in Transition Metals and Intermetallic Compounds.
22.	Shri Arun Kumar	Synthesis and Pharmacological studies of Indan Analogs.
23.	Sri Rabindra Pd. Sharma	Modelling of the Combustion Process for a Fuel Efficient four stroke spark Ignition Engine.
24.	Sri Arbind Kumar	Investigation on Metal Hydrides as carried to run the future vehicle engine on Hydrogen.
25.	Shri T. R. Ranganath	Studies on Honey Comb Stabilised Saltless Solar Pond.
26.	Sri U. S. Prasad	Stress induced magnetic and E.M. effects in Metals.
27.	Sri Girish Pathak	Tribological investigations in Mechanical Processing.

28.	Shri B. N. Sinha	Phytochemical and Pharmacological. Studies on some Plants used in indigenous System of medicine.
29.	Shri N. K. Singh	Pharmacological Studies of Pseudopelletierine Analogs.
30.	Shri K. K. Verma	On the Design of some Computer Algorithms to solve second order - ordinary Differential equations.
31.	Ms. Deepa Kulkarni	Formulation and studies of Oral Sustained / Controlled release drug drug delivery systems using Polysaccharide Polymers.
32.	Mr. N. V. Nagaraja	Pharmacokinetics of Methyl - N (5-(4-(2-Pyridinyl 1)-1 Piperazinyl) Carbonyl)-1 H - Benzimidazol - 2 - yl) Carbamate (CDRI 81 / 470), a new broad Spectrum Anthelmintic Agent.
33.	Ms. Swastika Ganguly	Syntheses and study of newer Imidazole Analogs.
34.	Shri G. Jagadeesh	Study of solar pumped Lasers for space Applications.

STUDENTS ACTIVITIES

Students once again put in their efforts as usual to keep the Institute flag flying higher and higher during 1995-96. The session started with a glamorous independence celebrations where students presented patriotic songs and a short play soon after the flag hoisting and saluting by NCC cadets. Next came the celebration of "Sadbhavana Diwas" on August 20, 1995. During the year number of other programmes were staged or activities organised by the various Committees and Clubs wherein students took an active part. Each of these Clubs/Committees worked under the guidance of their respective Professor-In-charges with the overall control of Cultural Co-ordinator. Some of these were :

Pooja Committee

This committe organised "Saraswati Pooja" and "Vishwakarma Pooja" with religious spirit and pomp and aesthetic sense. They also organised "Guru-Ka-Langer" while celebrating birth anniversary of Shri. Guru Gobind Singhji.

SPIC MACAY

This society meant for promoting Indian Classical Music and Culture amongst youths successfully achieved its goal by organising classical musical and dance performances cum demonstration lectures by the well known artists in their respective fields.

NAPS

Like previous years, it had been really a busy year for the News and Publications Society. In spite of their tight programme the society could put in efforts in bringing out "The Silhonette" under their banner. They had to struggle hard in bringing out "News Bulletins" during the tenure of XI Inter University National Youth Festival 1995-96. In addition to these daily bulletin, they proved their ability by publishing a Souvenir IUNYFEST'96.

AVEC

The Audio Visual Educational Club maintained their traditional characteristics by organising number of good film shows on technical and general topics.

DRAMATICS SOCIETY

This society maintained its tradition by staging "Nukkar Nataks" at befitting times like IUNYFEST'96, on Sadhbhawna Diwas celebration etc.

MUSIC CLUB

This club had been traditionally successful in creating a mark of its own on every occasion whenever they were asked to perform like during Independence celebration, Sadhbhawna Diwas celebration and during IUNYFEST'96 and convocation.

BHARTIYA SAHITYA PARISHAD

Being the guardians of maintaining and promoting Indian traditional Art and Culture among the youths, the BSP organised various literary and cultural activities during 1995-96. They organised several types of competitions on various occasions.

FINE ARTS SOCIETY

As the name indicates, this particular society had always been in limelight. This society, like earlier times, had been at the height of its success during 1995-96. They organised painting competitions for the campus children of different age groups and senior members of the society conducted training programmes for junior members and others.

HIGH LANDERS ADVENTURE CLUB

This club with 12 years of standing at the Institute is untirely and continuously engaged in promoting adventurism in the students by organising "Trekking", "Rock Climbing", "River Rafling" etc. The members of this club undertook several trips to mountain ranges of Himachal Pradesh, Kumaon and Garhwal, Sikkim and Nepal and made successful trekking to Lahaul spiti valley during the year.

BITIAN'S NATURE CLUB

Being a member of the prestigious World Wildlife Federation for Nature, the members maintained to keep their flag high.

UNESCO CLUB

Justifying the tradition of the club, members organised programmes such as debates, quizes etc in order to achieve their goal of universal brotherhood.

PHOTOGRAPHIC SOCIETY

The society trains the students in various aspects of photography. As usual members of the society documented all the official and social occasions of the Institute. They successfully covered XI National Youth festival'96.

ENGG. SOCIETY

The society continued its efforts to encourage students in promoting their scientific and technical thoughts through a number of seminars and "Talks" by experts in the concerned fields.

In addition to these societies, Amateur Radio Society, Indian Association of College Going Scientists, Leo and Rotract Club of B.I.T carried out their usual programme of activities.

YOUTH FESTIVAL

The most prominent feature under the domain of cultural activity during 1995-96 has been the honour awarded to our Institute for hosting the XI Inter University National Youth Festival sponsored by Association of Indian Universities and Department of Youth Affairs and Sports, Government of India. The function was held during February 7-11, 1996. 59 teams comprising of a contingent of seven hundred artists and team managers participated in the function. During the period several dignitories and celeberatories visited the festival. The Chief Minister of Bihar state, Sri Laloo Prasad inaugurated the festival. Prof. K B Powar, Secretary General, Association of Indian Universities was the Guest of Honour for this function.

The various competitive events such as light vocal (music), classical vocal solo, classical instrumental solo (both percussion and non-percussion type), Group song (Indian & Western), Western vocal solo, one act play, Drama, Debate, Elocution, Skit, Mime, on the spot painting, poster making, clay modelling, cartooning, Rangoli, quiz, collage, classical dance & folk/tribal dance were held at three different venues in the Institute premises viz. Mini-auditorium, OAT and Hall No. 211.

At the end of the hectic activities of the whole day, usually special programmes were arranged daily for the healthy entertainment of participants and the residents of the campus. At these special programmes persons of repute in different fields like Mr. Sampson David, Sri. Budhadev Dasgupta, the world famous Sarodist, Talat Aziz, the famous Ghazal singer and Dr. (Mrs.) Aban Mistry, the disciple of Pt. Jijina, the famous lady Tabla player, who were amongst the judges also, performed. These special programmes were followed by the sponsored programmes where members of different societies and clubs of BIT showed their talents.

On the last day, the cultural procession in which members of all the teams dressed in colourful costumes of their respective region made the festival meaningful and memorable. The procession started from the Institute main gate and after

passing through the campus culminated at OAT, the venue of the valedictory function. Here the unity in diversity was clearly visible as participants intermingled during the procession.

His Excellency, the Governor of Bihar State, Dr. A. R. Kidwai graced the occasion as Chief Guest at valedictory function held on last day. In his speech, he mentioned the importance of such festivals. He also gave away prizes to the winning members of various teams.

GAMES, SPORTS & N. C. C.

Games & Sports (Physical Education)

Since inception, the Institute has placed emphasis on Games and Sports. Earlier this activity used to be organised as a co-curricular programme but from 1984 the Games and Sports has been provided in the regular curriculum of the graduate programmes of the Institute and carries full weightage of 2 units in 1st and 2nd semester. The students are exposed to physical training, gymnastics, track and field thrice a week and on the other days they are required to play the allotted games. Suitable arrangement for training and participation of Girls students has also been made and their participation in P.T & Games is compulsory. On an average over 50% of the students opt for these activity.

Like in previous years, the Chetan Dev Raj Memorial Inter Technical Institutions Cricket Tournment 95-96 was organised by B.I.T., Mesra in the month of November 1995. B.I.T., Mesra won the Championship and Assam Engineering College, Guwahati was runners up. Other events, like Intramural competitions/tournments and Annual Athletic Meet were organised during the session. Students of graduate and post graduate programme participated in the activities. Institute Tennis Team played in North & East Zone Inter University Tennis Tournment upto quarter final rounds.

N. C. C

A Unit of the National Cadet Corps was set up in the Institute in 1957 for imparting technical as well as general training to the students. Intially, it functioned as EME Section with a strength of 60 cadets. In order to encourage students active participation in this programme in 1984 the Institute provided it was included as a regular curriculum with two unit weightage during the initial 2 semesters.

At present NCC unit is functioning as a full fledged Composite Technical Company consisting of three sections : viz. (i) Engineers Corps and (ii) EME Corps and (iii) Signal Corps, and its designation is "3Bihar Comp.(Tech.) Coy., N.C.C., B.I.T. Mesra". It has sanctioned strength of 200 Cadets.

The 3rd Bihar Comp.(Tech.) Coy of B.I.T. Mesra works under the command of a whole time Army Officers who are Proffessors of the Institute, five P.I. Staff from the Army, with about 8-10 clerical and other supporting staff who are provided by the State Government. Besides an administative building on the main Campus the NCC unit has adequate facilities like Parade Grounds, Firing Range and Armament Stores, Clothing Stores, Library, Staff Quarters etc.

The training programme is designed to pay stress upon the technical aspects of training in the form of Engg. Projects duly supported by lectures and practical classes (6 period/week); the training for Engineers Corps mainly covers field work, field defence, Military Brigades, Roades and Aerodromes; Water Supply, Demolition etc. The Technical Training of EME Corps covers Inspection and repairs of vehicles, Diving practice and maintenance. Acquisition with different components of Automobilies, Mechanism and elementry principles of different class of army vehicles; and for the Signal Corps it covers Wireless equipment operatio, Line equipment, Line transmission theory, Acquisition with Morse code and handling or telegraphic instruments etc.

Apart from the technical training the NCC also provides general training to all cadets in order to inculcate the leadership qualities, high morals, unity, discipline etc. The NCC has special arrangement for training of those cadets who appear for 'B' and 'C' Cetificate exam. of NCC (Tech.)

During the year 1995-96, total 127 cadets were enrolled in the NCC coy. of the Institute. Out of which 37 in the Engineers Corps, 41 in the EME Corps and 49 in the signal corps.

STUDENT WELFARE SCHEME

Financial Assistance to needy students : The Institute provides Full freeship / half freeship to very poor and poor students respectively. The number of students benefited during 1995-96 were 84.

Book Bank : Books are loaned to the needy students through Book Bank Scheme.

THE STUDENTS' HALLS OF RESIDENCE

The Institute is completely residential and all the students are required to stay in one of the Hostels or Halls of Residence numbered serially - as Hostel 1 to 7. In addition there are two separate Hostels for girls With the assistance from the U.G.C. and the State Government one extension unit for Girls has been constructed and is ready for use from the current academic session.

All the hostels are laid out beautifully to match the serene and pleasant campus with flower beds, bushes and trees encompassing each hostels, besides the well maintained lawns in front. The architecture of the hostel includes central facilities like spacious Dining Halls in the Centre and Common Rooms and reading Rooms, placed symmetrically on both sides of the central entrance and wide varandahs all along the length with air gaps and balconies well set for common use.

Each student is accommodated in a single-seated room, furnished with a steel table and a steel chair. The girl students are kept in two-or-three furnished rooms. Each room is quite spacious with a big size window and a steel door oppositely placed to make the room airy. Each room has a cup-board, wardrobe and a wide and deep rack.

Each hostel has a Common Room, where Indoor Games are available. Each hostel has a Reading Room also where sufficient number of Magazines, Periodicals and Newspapers by consensus are made available to the residents of the hostel. Provision of getting the old magazines and periodicals issued to students are available. Each hostel has also been provided with a Colour Television Set.

Frequent competitions are organised among the inmates of the hostel in a number of indoor games. Inter Hostel Tournaments in the indoor and outdoor games are a regular and very attractive feature of the hostel life.

Once in a year, the inmates organise a Hostel Night, where in the improvised stage, well selected cultural and musical programme, games and special items based on intimate knowledge pack the evening with fun and exciting festive mood.

Each hostel has an independent Mess, completely managed by the students through Mess Committee members elected from among the residents themselves. The Committee looks after the complete management including the Menu, preparation, purchases and billing under the supervision of the Superintendent/Assistant Superintendent of the hostel. The bills are made on 'No profit no loss' basis and the monthly bills of the residents are submitted in Mess Accounts Office, where individual student pays accordingly. The menu and monthly bills of the various hostels are assessed and revised periodically in the Meeting of the Hostel Council under the chairmanship of Chief Warden.

TRAINING AND PLACEMENT

The Training and Placement division interacts with potential employing Organisations, the concerned students and Departments and faculty to try and best achieve the aspirations of the students and the requirements of the organisations.

Apart from arranging Placement services, this division also encourages and tries to arrange industrial training for students during their vacations, at organisations spread over the country.

We are glad to note that campus placement activities have shown a continuously successful trend for many years. 2400 graduates and postgraduates have been recruited through campus interviews during the past 14 years.

During the last academic session, 1995-96, we were visited by about 45 premier organisations. By June 1996, most of these companies had intimated their final selections, offering about 353 appointments to graduates from different disciplines. About 20 students had received more than one offer. Some organisations were expected to finalise or increase their selections later, bringing the total number of appointments to about 360.

Biodatas of willing students of B.M.I, M.I.S,D.C.A and others and/or profiles of batches of various disciplines were also dispatched to potential employers. It is hoped that some students would be subsequnelty called for interviews by these companies.

During the year under report 650 students received vacation training at various organisations during the Puja and summer vacations.

The details of confirmed appointments offered to the outgoing students by the various organisations during the year under report is as follows:

DISCIPLINE / BRANCH		NO. OF JOBS
B.E.	Mechanical	80
	Production	18
	Electronics & Communication	68
	Electrical & Electronics	51
	Computer Science	37
	Civil	04
M.B.A.		09
M.C.A.		39
M.E.	Electronics	07
	Electrical	05
	Mechanical	04
M.I.S.		01
B. PHARM		27
M. PHARM		03
Total No. of Appointments		353

COMPOSITE SUMMARY OF PLACEMENTS STATUS 1995-96

	Organisation	No. of Placements
01.	Associated Cement Company, Ltd., Bombay	04
02.	Advanced Radio Masts Ltd., Hyderabad	05
03.	Ballarpur Industries, New Delhi	02
04.	Bakelite Hylam, Hyderabad	04
05.	Bharat Petroleum Corpn. Ltd., Bombay	04
06.	Bihar Caustic & Chemicals Ltd., Garhwa Road	01
07.	Birla Horizons International, New Delhi	09
08.	CMC Ltd., Calcutta	05
09.	COMFED, Patna	02
10.	Core Healthcare Ltd., Ahmedabad	20
11.	Crompton Greaves Ltd., Bombay	05
12.	Dun & Bradstreet Satyam Software, Madras	06

13.	Eicher Tractors Ltd., Faridabad	04
14.	Eli-lilly Ranbaxy Ltd., New Delhi	02
15.	Essar Telecom, New Delhi	02
16.	Fusion, Jamshedpur	01
17.	HCL HEWLETT PACKARD Ltd., Noida / Calcutta	17
18.	Hindustan Motors Ltd., Uttapara	03
19.	Hindustan Motors Ltd., Tiruvallur / Hosur	01
20.	Hindalco Industries Ltd., Renukot	11
21.	Indorama Synthetics, Nagpur	09
22.	Jaypee Rewa Cement Ltd., Rewa	03
23.	Larsen & Tourbo - ECC, Calcutta	14
24.	Larsen & Tourbo, Bombay	04
25.	Laxmi Boilers, Bombay / Bangalore	04
26.	LML VESPA Ltd., Kanpur	09
27.	Lupin Labs, Bombay	05
28.	Nucleus Software Offshore (p) Ltd., Bombay	03
29.	Orissa Cements Ltd., Calcutta	04
30.	PCL - Mindware Software Exports, Bangalore	05
31.	Pertech Computers Ltd., New Delhi	05
32.	Ramco Systems, Bombay / Madras	12
33.	Satyam Computer Services, Madras	18
34.	Shriram Bearings Ltd., Ranchi	04
35.	Sun Pharma Industries Ltd., Baroda	06
36.	TATA Consultancy Services, Calcutta / Delhi	65
37.	TATA Consultancy Services, Calcutta	09
38.	TATA TELECOM, Calcutta / Gandhinagar	03
39.	THE TATA IRON & STEEL Co. Ltd., Jamshedpur	24
40.	TATA UNISYS, New Delhi	08
41.	TATA Engg. & Locomotive Co. Ltd., Jamshedpur	07
42.	Usha Martin Industries Ltd., Ranchi	12
43.	WIPRO Systems Ltd., Banalore	12
44.	Electrosteel Castings, Calcutta	**
45.	Kalyanpur Cements, Patna	**
46.	LML VESPA	**

** RESULT OF FINAL INTERVIEW AWAITED.

Other organisations which have planned their visits are :

01. ASEA Brown Boveri Ltd., Banalore
02. A. F. Ferguson, New Delhi
03. CEAT, Calcutta
04. Dunlop India Ltd., Calcutta
05. ITC, Calcutta
06. J K Organization, New Delhi
07. National Engg. Industries Ltd., Jaipur
08. Siemens Ltd., Delhi
09. Ubest, Calcutta
10. Usha India, New Delhi

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Annexure - I

BOARD OF GOVERNORS

(As On 31-08-1996)

Chairman	:	Shri G. P. Birla
Vice-Chairman	:	Shri C. K. Birla
Members :		
Nominee of the Government of India, Ministry of Human Resource Development	:	Shri S. D. Awale
Nominee of the University Grants Commission	:	Prof. A.K. Ghosh
Nominee of the All India Council for Technical Education	:	Dr. A. Chattopadhya
Commissioner & Secretary Sc. & Tech., Govt. of Bihar (Ex-officio)	:	Shri Mahesh Prasad
Commissioner & Secretary Education, Govt. of Bihar (Ex-officio)	:	Shri K. C. Saha
Commissioner, Chhotanagpur Divn. (South), Bihar, Ranchi (Ex-officio)	:	Shri U. K. Sangma
Nominee of the Chancellor	:	Shri F. Ahmed
Nominee of the Hindusthan Charity Trust	:	Shri C. K. Birla Shri Deepak Chatterjee Dr. H. C. Pande
Vice-Chancellor, BIT, Ranchi (Ex-officio)	:	Prof. A. K. Aggarwal
Member of Institute Faculty	:	Prof. A. K. Aggarawal Shri Subir Samanta
Member selected by the General Council	:	Shri D. N. Patodia Shri K. P. Singhi Shri G. P. Lal
Secretary : Registrar (Actg.)	:	Prof. G. Sahay

Annexure - II

TECHNICAL COUNCIL

(As On 31-08-1996)

Chairman : Vice-Chancellor, BIT, Ranchi (Ex-officio)	:	Prof. A. K. Aggarwal
Members :		
Nominee of the Chancellor	:	Shri G. P. Lal Nomination awaited Nomination awaited
Director of Technical Education, Govt. of Bihar (Ex-Officio)	:	Dr. Bharat Bhushan
Director of Higher Education, Government of Bihar (Ex-Officio)	:	Dr. Vidyasagar Yadav
Professors of the Institute	:	Dr. C. B. Mishra Prof. K. P. Sinha Dr. B. K. Razdan Dr. J. N. Mishra Dr. N. L. Munjal Dr. S. Kumar Prof. R. A. Sharma Prof. S. H. Kekre Prof. S. C. Goel Prof.B.S.Rajeevalochanam Dr. R. K. Shrivastava Dr. Ashok Misra Prof. Awadh Prasad Dr. A. K. Chatterjee Dr. R. C. Prasad Dr. B. B. Mishra Dr. B. G. Varshney Dr. P. K. Mahanti Dr. S. P. Basu Dr. J. Ram Prof. M. K. Saxena Prof. S. P. Bhatnagar

Annexure - II

(Continued)

Professors of the Institute	:	Prof. B. P. Roy Dr. A. K. Sharma Dr. N. C. Mahanti Prof. A. P. Singh Dr. S. N. Mehrotra Dr. P. K. Barhai Prof. S. Sengupta Prof. K. R. Roy Chawdhary Prof. N. R. Rao Prof. B. M. Karan Prof. K.P. Singh Dr. B.L. Gupta Dr. D. Jairath Prof. R. K. Narayan Dr. Mohan Verma Dr. G. M. Panpalia Prof. K. V. Krishnamurthy Dr. D. Sasmal Dr. S. S. Dhabriya Prof. Ram Pal Singh
Persons appointed by the Chairman vide Clause 4 of the Regulations	:	Prof. G. C. Singh Prof. R. S. Yadav Dr. (Mrs.) M.Mukherjee
Librarian	:	Dr. U. N. Singh
Controller of Examinations	:	Dr. P. C. Joshi
Secretary : Actg. Registrar	:	Prof. G. Sahay

Annexure - III

FINANCE COMMITTEE

(As on 31-08-96)

Chairman	:	Shri G. P. Birla
Members :		
Nomineee of the University Grants Commission	:	Shri P. Bhatia
Nominee of the Chancellor	:	Shri S. Vijayaraghawan
Nominee of the Board of Governors	:	Shri C. K. Birla
Nominee of the General Council	:	Dr. H. C. Pande
Vice-Chancellor, B.I.T., Ranchi	:	Prof. A. K. Aggarwal
Hony. Treasurer, B.I.T., Ranchi	:	Shri S. S. Jajodia
Secretary :		
Registrar (Actg.)	:	Prof. G. Sahay

BUILDING & WORKS COMMITTEE

Chairman		
Vice-Chancellor, B.I.T., Ranchi	:	Prof. A. K. Aggarwal
Members :		
Adviser, Planning & Campus Development	:	Prof. G. P. C. Rao
Treasurer, B.I.T., Ranchi	:	Shri S. S. Jajodia
Representative of the Institute Architects	:	M/s. Kothari and Associates, Calcutta.
Representative of the State PWD	:	Shri B. K. Verma Supdtg. Engineer, PWD Ranchi.
Head, Dept. of Civil Engg.	:	Prof. B.S. Rajeevalochanam
Member-Secretary :		
Registrar (Actg.)	:	Prof. G. Sahay

Annexure - IV

EXECUTIVES AND DEPARTMENTAL HEADS/INCHARGES

(As on 31-08-96)

Vice-Chancellor	-	Prof. A. K. Aggarwal
Treasurer	-	Shri S. S. Jajodia
Registrar (Actg.)	-	Prof. G. Sahay

DEANS

Policy Planning & Faculty Development and Industrial Consultancy & Liaison	-	Dr. C. B. Mishra
Planning & Budgetary Control	-	Prof. K. P. Sinha
Post-Graduate Studies	-	Dr. B. K. Razdan
Under-Graduate Studies	-	Prof. S. H. Kekre
Administration	-	Dr. B. G. Varshney
Assistant Treasurer	-	Shri G. S. Chhaochharia

DEPARTMENTAL HEADS/INCHARGES

Architecture	-	Prof. S. Sengupta
Applied Chemistry	-	Dr. B. L. Gupta
Applied Mathematics	-	Dr. B. G. Varshney
Applied Mechanics	-	Prof. N. R. Rao
Applied Physics	-	Dr. J. Ram
Civil Engineering	-	Prof. B.S.Rajeevalochanam
Computer Science & Engineering	-	Dr. P. K. Mahanti
Electrical & Electronics Engg.	-	Dr. R. K. Shrivastava
Electronics & Comm. Engg.	-	Prof. S. C. Goel
Management	-	Prof. Awadh Prasad
Mechanical Engineering	-	Prof. A. P. Singh
Pharmaceutical Science	-	Dr. A. K. Sharma
Polymer Engineering	-	Dr. (Mrs.) M. Mukherjee
Production Engineering	-	Dr. S. Kumar

Annexure - IV

(Continued)

DEPARTMENTAL HEADS/INCHARGES

Physical Education & Sports	-	Shri R. S. Yadav
Remote Sensing	-	Dr. S. S. Dhabriya
Space Engineering & Rocketry	-	Dr. N. L. Munjal
OSD & Controller Entrance Examination	-	Prof. G. C. Singh
Controller of Examinations	-	Dr. P. C. Joshi
Co-ordinator Semester Programme	-	Dr. D. Sasmal
Finance	-	Shri M. L. Verma
Library	-	Dr. U. N. Singh
Medical Officer	-	Dr. (Mrs.) C. Mishra
Nodal Centre	-	Prof. M. K. Saxena
Training & Placement	-	Dr. D. Jairath
Proctor	-	Prof. A. P. Singh
Chief Warden	-	Prof. K. P. Singh
Cultural Co-ordinator	-	Dr. S. P. Basu

Annexure - V

Detailed Break up of candidates Qualified for Award of Degree / Diploma / Certificate, from 22nd September 1995 to 30th September 1996

Branch	Total
1. Under Graduates	
B.E. Civil	33
B.E. Computer Sc.	46
B.E. Electrical	62
B.E. Electronics	71
B.E. Mechanical	95
B.E. Production	35
B. Pharm.	39
B. Sc. (Architectural Sc.) Assistantship D.E.*	06
	387
2. Post Graduate	
Master of Business Administration	53
Master of Computer Applications	56
M. E. Automated Manufacturing System	03
M.E. Civil	02
M.E. Electrical	05
M.E. Electronics	11
M.E. Mechanical	10
M.E. Space Engineering & Rocketry	05
M. Pharm.	11
M. Sc. B.M.I.	11
M.Sc. Information Sciences	07
Diploma in Computer Applications	21
Diploma in Computer Applications D.E.*	10
	205
3. Ph.D.	
Pharmaceutical Sciences	01
G. Total	**593**

* Distance Education / Off-Campus Programme.