MINUTES OF THE 179TH MEETING OF THE UNIVERSITY GRANTS COMMISSION ON HELD ON APRIL 29,1976

UGC

CONFIDENTIAL

UNIVERSITY GRANTS COMMISSION

MINUTES OF THE 179TH MEETING OF THE UNIVERSITY GRANTS COMMISSION HELD ON APRIL 29, 1976.

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The following were present:

Professor Satish Chandra	-	Chairman
Shri K.N. Channa	-	Member
Professor R.P. Bambah	-	Member
Professor S.S. Saluja	-	Member
Professor (Miss) A.J. Dastur	-	Member
Professor J.B. Chitambar	-	Member
Professor Maqbool Ahmed	-	Member
Professor B.M. Udgaonkar	-	Member
Dr. Chandran D.S. Devanesen	-	Member
Shri R.K. Chhabra	-	Secretary

Dr. Ajit Mozoomdar and Professor S. Gopal expressed their inability to attend the meeting.

SECRETARIAT

Additional Secretary

Dr. D. Shankar Narayan

Joint Secretary

Dr. J.N. Kaul

Deputy Secretaries

Shri S. Viswanath
Shri I.K. Sangma
Dr. S.C. Goel
Shri S.P. Gupta
Dr. M.L. Mohta
Shri Y.D. Sharma
Shri A.B. Gupta
Shri M.P. Balakrishnan

Director (SRC)

Dr. Jagdish Shankar

Finance Officer

Shri R.P. Bhattacharjee

The Chairman welcomed Professor Maqbool Ahmed who was attending the meeting of the Commission for the first time.

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Item No. 1 : To receive the minutes of the meeting of the Commission held on 22nd March, 1976.

The minutes of the 178th meeting of the University Grants Commission held on March 22, 1976 were confirmed.

Item No. 2 : a) To approve the action taken on certain matters.
b) To receive the items of information.
c) To receive the statement of proposals which could not be accepted by the Commission.

(a) The Commission approved the action taken on items listed in Appendix I*. Arising out of this, the following decisions were taken :

(i) Item 2(a)(3) - The Commission, keeping in view of the special needs of the Berhampur University, desired that it may be assisted as recommended by the Visiting Committee for the construction of the workshop building, Herbarium (Botany Department), Animal House (Zoology Department) at an estimated cost of Rs. 1,10,000.

(ii) Item 2(a)(14) - The Commission was of the view that the Universities be advised that the teachers of the affiliated colleges located at the headquarters of the university and possessing the requisite qualifications as suggested by UGC be encouraged to participate in the postgraduate teaching in the university departments.

(iii) Item 2(a)(23) - The University may be advised to appoint the staff already agreed to as soon as possible.

(iv) Item 2(a)(25) - The English Summer Institute for 1977 to be organised by the C.I.E.F.L., Shillong for universities in the region may be organised in collaboration with the North Eastern Hill University.

(b) This was noted.

(c) This was noted.

Item No. 3 : To approve the statement of grants released after the last meeting of the Commission held on 22nd March, 1976.

The Commission approved the grants released after the last meeting of the Commission held on 22nd March, 1976 (Appendix II*).

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*Not enclosed.

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Item No. 4 : To receive the statement of expenditure incurred by the University Grants Commission during 1975-76 upto 31st March, 1976.

This was noted.

Item No. 5 : To receive the minutes of N.C.C. Committee appointed by the Commission to consider the recommendations made by the Evaluation Committee set up by the Government of India on the working of N.C.C.

The Commission accepted the views of the Committee on the recommendations made by the Evaluation Committee set up by the Government of India on the working of the N.C.C. as given in Appendix III, and desired that the same be communicated to the Ministry of Education.

In this connection it was pointed out that a Committee was being appointed separately to prescribe the guidelines for courses in Defence/Military Studies.

Item No. 6 : To consider the report of the Visiting Committee appointed by the Commission to assess the Fifth Plan proposals of the Jadavpur University.

The Commission considered the Report of the Fifth Plan Visiting Committee on Jadavpur University and generally accepted the recommendations made by the Committee subject to the following:

i) The University may set up an Academic and Planning Board which may develop inter-action between various faculties and formulate new courses on an inter-departmental basis as suggested by the Visiting Committee. The Board may also coordinate and continuously evaluate the progress of the Fifth Plan development schemes and projects.

ii) The question of developing studies in linguistics in the university may be examined with the help of an Expert in linguistics and the recommendation of the Visiting Committee for providing teaching staff in linguistics to the departments of English and Sanskrit may be considered in the light of the views of the Expert.

iii) The specialization for the post of professor in the department of English may be English language teaching.

iv) The post of Reader recommended under 2nd priority for Geology Department may be provided to the Department of Chemistry with specialisation in Photo-Chemistry.

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v) The recommendations of the Visiting Committee about providing additional teaching staff to the departments of Mathematics and Physics may be considered after the views of the University on the various suggestions made by the Visiting Committee with regard to the development of new areas in these departments are available.

vi) Teaching staff as recommended by the Visiting Committee under first priority in respect of other departments may be provided to the university. The question of providing teaching staff recommended under second priority may be considered after joint courses as suggested by the Visiting Committee have been formulated by the university and examined.

vii) Posts of two technical assistants may be provided to the department of Geology.

viii) A grant of Rs.2.5 lakhs as UGC share may be provided to the university on 50:50 sharing basis for campus development and improvement of water supply facilities.

ix) A grant of Rs.2 lakhs as UGC share may be provided on 50:50 basis for improvement of facilities in the existing hostels.

x) A grant of Rs.5 lakhs for equipment and posts of one instrumentation engineer and one technical assistant may be provided for establishment of central instrumentation laboratory.

The question of providing staff for central instrumentation laboratory in the universities may be examined with the help of an Expert Committee.

xi) The financial implications of the scheme accepted by the Commission are indicated in the Appendix IV.

Item No. 7 : To consider the report of the Visiting Committee appointed by the Commission to assess the V Plan proposals of the Calcutta University.

The Commission considered the report of the Fifth Plan Visiting Committee on Calcutta University and fully agreed with the views expressed by the Visiting Committee on the suggestion made by the Ghani Committee with regard to declaring Calcutta University as an Institution of National Importance by the Central Government.

The Commission noted the recommendation of the Visiting Committee regarding the de-centralisation to be implemented simultaneously for administrative and academic purposes and agreed that it would be desirable that this de-centralisation be brought up by setting up different campuses of the Calcutta

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University. If this is acceptable to the Calcutta University, the Commission agreed to provide an allocation upto Rs. one crore, as its share, for this purpose and desired that the University be requested to submit its proposals for the consideration of the Commission.

The Commission further noted that the Calcutta University had been informed that an amount upto Rs. 2 crores, as its share, would be available to the University during the Fifth Plan for the colleges within the metropolitan limits of Calcutta for providing inter-institutional facilities at different places and also for establishment of academic centres for improvement of standards of undergraduate education in colleges. It was noted that the University had already been requested to set up a Group for formulating this proposal. The Commission desired that the Calcutta University be requested to take immediate steps in this regard keeping in view the suggestion made above for setting up multi-campuses of Calcutta University.

The Commission generally accepted the other recommendations made by the Visiting Committee subject to the following:

(1) The Commission could not agree with the suggestion for separating Honours courses from M.A./M.Sc. courses in the departments of Psychology, Anthropology and Physiology and for transfer of Honours courses to the colleges.

(2) The Commission was not in favour of starting postgraduate classes in the colleges affiliated to Calcutta University. The question of strengthening teaching and research programmes in the Presidency College, Calcutta and developing it as an autonomous college may be considered separately.

(3) The University and the State Government may take immediate steps to either merge the Institute of Basic Medical Sciences with the Postgraduate Institute of Medical Education & Research or provide adequate hospital facilities to the Institute of Basic Medical Sciences. The question of providing assistance to the existing departments in the Institute of Basic Medical Sciences as recommended by the Visiting Committee may be considered only after a decision is taken on this.

(4) A specific amount be provided every year in the Revenue Budget of the university for the maintenance of the university buildings.

(5) A certain percentage of seats in the university hostels be earmarked for research scholars enrolled with the university specially for those who come from outside the State.

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(6) The procedure for appointment of teaching staff in the university needs to be looked into by the university and the State Government. The observations made by the Visiting Committee may be kept in view while considering amendment of the University Act.

(7) The University should take immediate steps to fill all the vacant posts in each department and Commission's assistance for the teaching staff approved for a department be made available only after the existing posts available in that department have been filled.

(8) The suggestion made by the Visiting Committee for establishing regional offices of the University Grants Commission is a wider issue and will have to be examined in detail separately.

(9) Fifty Junior Research Fellowships being allocated to the University for the Fifth Plan period may be utilised for development of research facilities in the existing campus as well as in the new campuses to be opened by the university during the Fifth Plan period.

(10) The teaching and other staff recommended by the Visiting Committee for various departments under first priority may be provided to the University.

(11) A grant of Rs. 7 lakhs for equipment and posts of four technical assistants including an Instrumentation Engineer may be provided to the University for establishment of a central instrumentation laboratory.

(12) Grants recommended under first and second priorities for extension of academic buildings may be provided to the University.

(13) Grant of Rs. 3 lakhs for improvement of facilities in the existing hostels and Rs. one lakh for furnishing the guest house be provided as UGC share to the University on 50:50 sharing basis.

(14) The financial implications of the schemes accepted by the Commission are given in the Appendix V.

Item No. 8 : To consider the Report of the Visiting Committee appointed by the University Grants Commission for assessing the development needs of the Indian Institute of Science, Bangalore, during the Fifth Five Year Plan.

The Commission generally accepted the recommendations of the Visiting Committee appointed by it for assessing the development needs of Indian Institute of Science, Bangalore, during the Fifth Five Year Plan period, and agreed to provide the grants as indicated in Appendix VI.

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The Commission further desired that the Indian Institute of Science, Bangalore, be requested that the details of the essential posts to be created within the total provision of Rs.12 lakhs and also for continuing education within the provision of Rs. 6 lakhs may be sent to the Commission for concurrence.

Item No. 9 : To consider the recommendations made by the Committee set up by the Commission to suggest Guidelines for formulating courses in History of Science and Technology in the Universities and Colleges.

The Commission generally accepted the recommendations made by the Committee and decided :

(i) A dozen or so universities may be identified for support in teaching and research of history of science and technology. The universities so selected should have attained some level of development in this area.

(ii) Ten Junior research fellowships may be instituted for supporting research in this area. The fellowships may be administered centrally by the UGC. These fellowships will be normally available to those departments which have already made some provision for teaching and research in this area. It is important that the selected fellows work with guides who have demonstrated their interest and capacity in this field.

(iii) A non-recurring grant of Rs.25,000/- may be made available to some selected university departments which have already undertaken studies and research in the history of teaching science and technology. This grant will be available to the central library of the university; books and journals to be brought with the help of this grant will be selected by a committee of the concerned department.

Item No. 10: To consider the report of the Committee appointed by the Commission to consider the proposal of School of Planning & Architecture, New Delhi, for declaring it as an Institution deemed to be University under Section 3 of the University Grants Commission Act.

The Commission considered the recommendation of the Committee appointed to consider the proposal of School of Planning & Architecture, New Delhi, for declaring the

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School as an Institution deemed to be university under Section 3 of the UGC Act, and accepted in principle to recommend to the Central Government that the School of Planning & Architecture may be declared as an Institution deemed to be University under Section 3 of the UGC Act. The Commission further desired that before this recommendation is sent to the Government of India, views of the Delhi University, to which the School is presently affiliated, may be obtained.

The Commission is further of the view that before a notification is issued in this regard, matters relating to governnance of the institution and other related matters may be examined by a Committee to ensure its functioning as a University.

Item No. 11 : To consider the report of the Committee appointed by the University Grants Commission to assess the programme of Continuing Education at Saurashtra University, Rajkot.

The Commission considered the report of the Committee appointed by it to examine the proposal of Saurashtra University, for assistance towards its programmes of continuing education and agreed to provide assistance as detailed below on a sharing basis of 75:25 for the purpose during the Fifth Plan period :

i) Director of the Centre (Honorary) - Rs.250/- p.m.
ii) Co-ordinator (Rs.1100-1600) - Revised.
iii) Programme Officer (Rs.700-1300) - Revised.
iv) Accountant-cum-clerk (265-465)
v) Typist (Rs.265-465)
vi) Messenger (Rs.110-170)

Expenditure on programmes (including honorarium to resource persons, TA and DA, remuneration to part-time assistants, etc. Books and Journals, Publication, miscellaneous expenditure e.g. Publicity, stationery, postage, electricity etc.) ... Rs. 50,000 p.a.

Non-Recurring Expenditure
(Equipment, Furniture etc.) - Rs.20,000

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Item No. 12: To consider the recommendations of the Committee appointed by the Commission to examine the Computer requirements of Annamalai University.

The Commission accepted the report of the Committee appointed by it to examine the Computer requirements of Annamalai University, and agreed to provide the following grants for the development of computer facilities:

1. Non-recurring

   a) TDC system including taxes about Rs.27.6 lakhs.

   b) Auxilliary equipment and building modifications etc. - Rs. 2.0 lakhs

2. Recurring (to be provided on net deficit basis)

   a) Technical Staff and maintenance etc. as per general norms to be prescribed.

Item No. 13: To consider the recommendations of the Committee appointed by the Commission to examine the Computer requirements of M.S.University of Baroda, Baroda.

The Commission accepted the recommendations of the Expert Committee and agreed to provide the M.S.University of Baroda the following grants for development of computer facilities:

1. Non-Recurring

   i) Computer phase I = Rs.30 to 32 lakhs
      phase II = Rs. 5 lakhs

   ii) Building including air-conditioning and installation of computers = Rs. 3 lakhs

2. Recurring

   i) Rs.50,000/- per annum from 1976-77 for purchase of computer time until the computer centre is established.

   ii) Other recurring assistance to be provided on net deficit basis according to the norms to be determined by the UGC Committee on computer development.

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Item No. 14: To further consider the question of increase in the value of the following awards under the scheme of "preparation of University level books by Indian Authors."

The Commission considered a note on the question of raising the value of the fellowship awards under the scheme of the preparation of university level books by Indian authors and decided that the value of the fellowship may be raised from Rs.500 p.m. to Rs.600 p.m. w.e.f. 1.9.1975 for those fellows already working under the scheme and who have a Ph.D. degree. In the case of other fellows working under the scheme as on 1.9.1975, the value of the fellowship may be raised to Rs.600/- p.m. when they complete two years of satisfactory work under the scheme.

The Commission could not agree to the suggestion that retired teachers/scientists who may take up book writing programme without the assistance of a fellow be paid Rs.750/-p.m as in the case of Retired Teachers Scheme. It was noted that such teachers/scientists would receive Rs.600/-p.m. w.e.f. 1st September, 1975.

Item No. 15: To consider further the question of institution of Readership in Single Faculty Colleges.

The Commission agreed that general criteria for creation of Readerships in Single Faculty Colleges be as follows:

1) The college should have satisfied all conditions of affiliation and should have secured permanent affiliation with the university.

2) The college should have demonstrated its willingness to initiate change and innovation in teaching and internal assessment.

3) The college should have an enrolment of at least 100 in degree classes and above; a faculty of at least ten teachers and student-teacher ratio of 1:10, good staff to be judged by the proportion of teachers with first class postgraduate or research degrees and with research publications, facilities for postgraduate education and research and a library of at least 20,000 books and 10 to 20 research and professional journals. These criteria would apply to Teachers training, Home Science and Physical Education & Fine Arts, Social Work etc. Colleges.

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4) In the case of Commerce Colleges, the college should have an enrolment of atleast 500 in degree classes and above, a student-teacher ratio of 1:20, good staff to be judged by the proportion of teachers with first class postgraduate or research degrees and with research publication, provision for tutorial system on an institutional basis, good examination results (60% and above), a library of atleast twenty to thirty thousand books and 15 to 20 academic and professional journals and facilities for postgraduate teaching and research.

5) The number of Readerships that may be made available in such colleges would be determined on the merits of each case, the assistance for such posts will be on 100% basis.

Item No. 16: To consider a proposal from Government of Madhya Pradesh to create Readership in the universities for their assignment to the Government Colleges.

The Commission generally agreed with the proposal of the Madhya Pradesh Government to create Readerships in the universities and assigning them to the Government colleges. The Commission felt that the number of Readerships to be so created would be in accordance with the guidelines accepted by the Commission.

Item No: 17: To consider the question of granting leave on academic grounds to junior and senior research fellows during tenure of fellowship.

The Commission decided that Junior and Senior Research Fellows working on the various programmes of research fellowships supported by U.G.C. may be granted leave up to one academic year during the entire tenure of the Fellowship for purposes of accepting teaching assignments on a temporary basis provided the post accepted by them is in the same department or in an institution located in the city and would therefore enable the fellow to continue with his research work also. This period would be counted towards the normal tenure of the Fellowship.

Item No. 18: To consider a proposal regarding enhancement of annual allocation made under the scheme of 'unassigned grants' to universities.

The Commission agreed that while determining the total unassigned grants to different universities for 1976-77, the following criteria may be followed:

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(i) The amount may be determined on the basis of Rs.30/- per faculty member; Rs.15/- per university research scholar, and Rs.5/- per postgraduate student of the university subject to a minimum of Rs.15,000 and maximum of Rs. one lakh. The numbers of the faculty members, research and postgraduate students are to be taken as on 15th of August of the previous year.

(ii) For the UGC Unit, Rs.12,000/- to a University having less than 50 affiliated colleges and Rs.18,000 to a University having 50 or more affiliated colleges.

Item No. 19: To consider the question of expanding the scope of the Book Bank Scheme to cover the Postgraduate and Professional colleges.

The Commission agreed that the scheme of Book Banks may be extended to all colleges including professional colleges listed under Section 2(f) of the UGC Act. The Commission could not agree for separate book banks for the postgraduate students.

The Commission desired that for purposes of determining enrolment under the Book Bank as well as Rs.5 lakh scheme, the enrolment both at the undergraduate and postgraduate level excluding PUC and Intermediate may be taken into account.

The Commission further agreed that such of the colleges which have fully utilised the assistance already made available under the Book Bank scheme, may be assisted further during 1976-77 and the assistance to be given would be upto. 50% of the grant earlier approved.

Item No. 20: To consider the suggestion to increase the amount of honorarium paid to awardees under the scheme 'USRT' by the institution, where the teacher works.

The Commission decided that under the scheme of utilisation of the services of retired teachers, an institution where the teacher works may be permitted to pay to the teacher concerned from its own funds, if it so desires, an additional honorarium upto a maximum of Rs.6,000/- per annum, subject to the prior approval of the U.G.C., instead of Rs.4,000/- per annum as provided under the rules at present.

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Item No. 21: To consider proposals from Jawaharlal Nehru University for additional funds during the 5th Plan period.

The Commission considered the proposals of the Jawaharlal Nehru University for additional funds during the 5th Plan period and decided as follows:

(a) The University be assisted for augmentation of water resources for horticulture at an estimated cost of Rs.22 lakhs.

(b) Provision of Vice-Chancellor's residence be agreed to at an estimated cost of Rs.1,25,000/-.

(c) The proposals relating to purchase of equipment for the School of Theoretical & Environmental Sciences, School of Life Sciences, Central Workshop and Instrumentation, laboratory facilities may be examined by an expert committee in the first instance.

(d) Requirements of the Computer and System Sciences may be referred to the Standing Committee on Computer Sciences.

The Commission could not, at this stage, accept the proposal of the Jawaharlal Nehru University for provision of additional funds for construction of women's hostel and the second phase of the School building.

Item No. 22: To consider the proposal of Dibrugarh University for the introduction of Postgraduate course in Petroleum Technology.

The Commission noted the non-recurring assistance that may be available from the Ministry of Petroleum to the Dibrugarh University for the introduction of Postgraduate courses in Petroleum Technology. The Commission desired that a committee may be appointed to work out the financial implications for introduction of this course and agreed to provide assistance for recurring expenditure as may be recommended by the committee and accepted by the Commission provided that the State Government would agree to take over this as committed expenditure after the Commission's assistance ceases at the end of 1980-81.

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Item No. 23: To consider the proposal of the Rajasthan University for the construction of building for the Institute of Correspondence Courses.

The Commission accepted the proposal of the Rajasthan University for financial assistance towards the construction of a building for the Institute of Correspondence Courses at an estimated cost of Rs.6 lakhs on a sharing basis of 50:50. This is subject to the condition that the University of Rajasthan accepts the guidelines formulated by the UGC for introduction of correspondence courses.

Item No. 24: To consider the amendment proposed by the University of Delhi to its Ordinance relating to Visiting Professors or Lecturers.

The Commission agreed that the guidelines earlier prescribed by it for appointment of Visiting Professors may be revised as given below. These guidelines would apply to the Visiting Professors invited from within the country as well as from other countries except that in the case of persons from other countries a provision may be made for payment of economy-class air-fare by direct route.

1. A Visiting Professor should be an eminent scholar in his subject.

2. The maximum tenure of a Visiting Professor be one year and minimum three months.

3. The Visiting Professor be paid honorarium up to Rs.3,000/- per month.

4. A suitable provision be made to enable the Visiting Professor to travel within the country for approved academic programme and also for reimbursement of medical expenses, if any.

Visiting Appointments

1. The duration of visit should not be less than two weeks and should not exceed four months in a year.

2. The travel expenses would be met by the host institution.

3. In case of a person receiving his salary from the "parent institution", for the period of the visit, the host institution would provide hospitality and pay an honorarium not exceeding Rs.1000 per month.

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4. In the case of a person not receiving his salary from his "parent institution" for a period of his visit, the "host institution" would pay an honorarium not exceeding Rs.2,500/- per month.

In the case of Visiting Fellows appointed in the Centres of Advanced Study, the Commission agreed that such appointments should not be generally less than 3 months and exceed one academic year at the most. The honorarium be fixed within a range of Rs.1500 to Rs.2500 per month depending on the academic standing of the person appointed as a 'Visiting Fellow'.

The Commission desired that the Delhi University be requested to review its Ordinance for appointment of 'Visiting Professors' in the light of the above.

Item No. 25: To consider the proposal of the Gujarat University for setting up a Department of Commerce.

The Commission accepted the proposal of the Gujarat University for setting up a Department of Commerce for providing postgraduate instruction in Commerce and agreed to provide for staff of one Professor, two Readers and three Lecturers within the grant already allocated during the Fifth Plan period.

The teaching of the postgraduate classes in Commerce would be organised by the Department of Commerce and the related departments in the School of Social Sciences and Management Studies.

Item No. 26: To consider the question of reviewing the policy of awarding Scholarships at the Honours and Master degree level in Arabic, Persian, Sanskrit and Pali.

Consideration of this item was postponed to the next meeting.

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Item No. 27: To receive a note on implementation of the revised scales of pay and the conditions attached to these i.e. minimum qualifications, examination, remuneration and code of conduct in different States.

The Commission considered the note on the implementation of the revised scales of pay and the conditions attached to these, and decided as follows:

(1) The minimum qualifications prescribed for recruitment to the posts of Lecturer in the Faculties of Arts, Social Sciences including Commerce and Science in the Universities be as per Appendix VII.

(2) The qualifications suggested for the posts of Lecturers at (1) above would also apply to all the Central Universities. It was also decided to ask the Delhi University to consider if they would like to have the same qualifications as suggested above for the teachers to be appointed in its colleges.

(3) A committee may look into the question of prescribing minimum qualifications for lecturers in the Faculties other than Arts, Science, Social Sciences including Commerce and also for teachers in foreign languages and such other subjects for which adequate facilities for Ph.D. are not available in the country.

(4) The teachers who are re-employed by the universities after attaining the age of superannuation i.e., 60 years, should not hold appointments as Head of Departments or Dean of Faculties or any other such administrative responsibility.

(5) The Government of India be requested to impress upon the State Governments to introduce retirement benefits (where not already done) as recommended by the "Sen Committee" and also provision for security of service for the employees of the universities and colleges.

(6) The Universities be requested to send a copy of the advertisement issued for recruitment to the teaching and academic posts and the qualifications of the persons finally appointed. In this connection, it was noted that the universities have been advised to send their advertisements for recruitment to the Employment News (Rozgar Samachar) being published by the Directorate of Audio Visual Publicity, Government of India.

(7) The Government of India be advised that condition (vi) for introduction of the revised scales of pay may be amended as follows:

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"The existing lecturers in colleges who did not possess at the time of their initial recruitment minimum qualifications as prescribed by the university concerned at the time of appointment should be required to attain these qualifications within five years from the date of placement in the revised scale. If they are unable to do so during this period, they should not be allowed to earn any future increment till they have satisfied this condition."

(8) The Commission could not accept the suggestion of the Government of Meghalaya that marginally lower level of academic performance should be allowed for a person belonging to Schedule Tribe for being eligible for appointment as a lecturer under revised scale of pay.

The Commission desired that the points raised regarding Code of Conduct in the note placed before it may be brought up again at its next meeting.

Item No. 28: To consider the Budget Estimates of the University Grants Commission for 1976-77 (Plan).

It was agreed that this may be brought up before the Commission at the next meeting and in the meantime the proposed estimates may be treated as the interim working budget.

Item No. 29: To consider certain establishment matters of the University Grants Commission.

(i) Report made by the Committee appointed to examine the question of recruitment of persons belonging to Scheduled Castes and Scheduled Tribes in the office of the UGC.

(ii) Recommendations of the Departmental Promotion Committee for Class-I posts made at its meeting held on 6th April, 1976.

(iii) Reappointment of Dr. D. Shankar Narayan as Additional Secretary, University Grants Commission on tenure basis for another term of 5 years.

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(i) The Commission accepted the recommendations contained in the report made by the Committee appointed to examine the question of recruitment of persons belonging to Scheduled Castes and Scheduled Tribes in the office of the University Grants Commission and desired that further necessary action may be taken as early as possible.

(ii) The Commission while noting that there was no eligible candidate belonging to the reserved category of Scheduled Castes and Scheduled Tribes in the cadre of Education Officer, Assistant Education Officer and Section Officer (Grade I) for promotion to the cadres of Deputy Secretary, Education Officer and Assistant Secretary respectively accepted the recommendations of the Departmental Promotion Committee for Class-I posts made at its meeting held on 6th April, 1976 and approved the following departmental candidates for promotion in the order of merit given below in the respective cadres of Deputy Secretary, Education Officer and Assistant Secretary:-

(i) For promotion to the Cadre of Deputy Secretary:

1. Dr. S.C. Goel
2. Shri S.P. Gupta
3. Dr. M.L. Mehta
4. Dr. T.N. Hajela
5. Shri Y.D. Sharma
6. Shri A.B. Gupta
7. Shri M.P. Balakrishnan
8. Shri L.R. Mal

(ii) For promotion to the Cadre of Education Officer:

1. Shri K.N. Bhatnagar

(iii) For promotion to the Cadre of Assistant Secretary:

1. Shri V.M. Seth
2. Shri O.K. Sharma
3. Shri H.N. Kaul
4. Shri C.M. Ramachandran
5. Shri M.R. Gupta (in relaxation of educational qualifications)
6. Shri Inder Lal

The Commission resolved that as per approved provision relating to the appointment of the post of Additional Secretary University Grants Commission, Dr. D. Shankar Narayan may be reappointed as Additional Secretary, University Grants Commission, on tenure basis for another term of five years w.e.f. 5th May, 1976.

Item No. 30: To note the date and place for the next meeting of the Commission.

The Commission agreed that the next meeting be held on 3rd, 4th and 5th June, 1976 at Simla.

Item No. 31: To consider the proposal of the Bombay University for the continuation of the Sabbatical Leave Programme in respect of teachers in Physics from the constitu-ent colleges of the University.

The Commission desired that the Sabbatical Leave Programme which was initiated as on ad-hoc basis at the Bombay University may be discontinued w.e.f. 1976-77, in view of the fact that the Commission has since formulated a detailed programme for Faculty Improvement Programme.

Item No. 32: To consider the question of extension of the two Senior Fellowship of the value of Rs.1,000/- each offered by University Grants Commission to Afghan Scholars by one year.

The Commission agreed that tenure of two Senior Fellowships offered by the UGC to Afghan Scholars be extended by one year.

Item No. 33: To consider the report of the visiting committee appointed to examine the proposal of the Gujarat University, Ahmedabad, for the introduction of postgraduate course in Textile Chemistry etc.

The Commission accepted the recommendations of the Visiting Committee appointed to examine the proposal of the Gujarat University, Ahmedabad, for the introduction of post-graduate courses in Textile Chemistry, Analytical Chemistry, and Polymer Sciences and agreed to provide assistance as under :

Textile Chemistry

Professor	-	1
Readers	-	2
Lecturers	-	3

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Analytical Chemistry

Professor	- 1
Readers	- 2
Lecturers	- 2

Polymer Science

Professor	- 1
Readers	- 2
Lecturers	- 3

The University may be requested to organise these courses on the lines suggested by the expert committee.

It was noted that the establishment of these courses would also help in channelising the students who would otherwise seek admission in Chemistry Department consequent upon the affiliated colleges discontinuing Post-graduate classes.

The Commission further noted that the entire non-recurring requirements for building and equipment for these courses would be met by the University out of the donations received by it. The Commission may be informed of the details of the expenditure incurred for these purposes.

(R.K. Chhabra)
Secretary

(Satish Chandra)
Chairman

Appendix III to Item No.5

DECISION OF THE UNIVERSITY GRANTS COMMISSION ON THE RECOMMENDATION OF THE EVALUATION COMMITTEE

	Recommendation of the Evaluation Committee	Views of the University Grants Commission
1.	Attendance at a NCC activity may be treated as academic attendance.	The NCC Cadets should be enabled to derive the benefits for purposes of academic attendance, in the same manner as it available for students participating in the N.S.S. programmes and sports etc.. Any approved NCC activity which makes it necessary for the cadets to miss their academic class work should be treated as valid for purposes of academic attendance. Such concession should however, not exceed, say more than 6 per cent of the minimum attendance required as per university regulations.
2.	Universities having Military Studies Departments should offer Military Science as an elective subject, open to NCC Cadets.	It would be more appropriate to designate the existing military studies department in the universities as departments of defence studies and associate in their teaching and field programmes, personal, both active and retired, from the Defence services. Defence studies or military studies should not be considered as an easy elective and alternatives to other courses. Accordingly, the contents to be included should be of university level and for this purpose a model syllabus could be laid down with the help of a Committee and the National Defence College. The syllabus so suggested could be suitably adopted by other universities.
3.	The possibility of NCC 'B' Certificate being treated as a subsidiary elective subject should be examined on the basis of a revised syllabus. A revised syllabus has also been attached.	The 'B' Certificate and its contents as at present cannot be accepted as a subsidiary elective subject for university studies. It should not be treated even as a subsidiary for a student offering military science as a major subject of study. The model syllabus to be suggested as indicated above, if it is of the university level, could perhaps be included as one of the subjects at the degree level in due course.

	Recommendation of the Evaluation Committee	Views of the University Grants Commission
4.	Other things being equal a student who has successfully completed NCC training may be given preference for admission to postgraduate and professional studies.	It may not be appropriate to give preference to students who have completed NCC training for purposes of admission to postgraduate and professional studies. However, only those cadets who have obtained either 'B' or 'C' certificates should be given due weightage as is generally given to outstanding sportsmen in the matter of admission to such courses.
5.	The teaching periods should be compressed to 5 days and one day in the week should be designated as Field day to be devoted to NCC activities as well as other youth activities, such as National Service Scheme and N.S.O.	The Committee regretted to accept this decision as it was not practicable.
6.	The Directors of National Cadet Corps in the States may be given powers to award 'Displeasure'/to the Part-time National Cadet Corps Officers with the provision for an appeal to the Vice - Chancellor.	In the present context it would be more appropriate to deal in such matters of indiscipline through the Heads of the educational institutions.
7.	The heads of colleges/institutions should have powers of discharge of Senior Division NCC Cadets as the Head-masters exercised those powers in respect of Junior Division Cadets.	The Committee was of the view that the powers to discharge the Cadets in the NCC should be vested with the Commanding Officer instead of the head of the Institution.
8.	Enrolment of students in NCC must be voluntary and selective. Rules of attendance must be strictly enforced after they join the organisation.	The Committee accepted the recommendation.

With regard to the reference from the Ministry of Agriculture and Irrigation regarding the guideline for a model Social forestry programme, the Commission was of the view that this should form part of the N.C.C. programme.

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Appendix IV to Item No.6

JADAVPUR UNIVERSITY

Schemes accepted by the Commission during the V Plan Period.)
(All figures are in lakh of rupees)

A) NON-RECURRING

S.No.	Item.	Amount approved
1.	Spill over	6.75
2.	Books	11.70
3.	Equipment	15.40
4.	Buildings/Furniture	12.10
5.	Misc. Schemes.	5.38
	Total:	51.33

B) RECURRING

1. 3 Professors, 7 Readers, 5 Lecturers, 8 Tech. posts and 1 Development Officer.

2. 15. Junior Research fellowships of the value of Rs.400/- p.m. at any given time to be operated according to UGC rules.

Details are given in Annexure I to IV.

ANNEXURE - I

JADAVPUR UNIVERSITY

Amount approved for books and equipment during the V Plan period. (The figures represent UGC share and are in lakhs of rupees. The amount includes basic grants for books (Rs.3.00) and equipment (Rs.5.00) already sanctioned during the V Plan period).

S.No.	Department.	Books	Equipment.
1.	English	0.30	-
2.	Comparative Literature	0.50	-
3.	Bengali	0.20	-
4.	Sanskrit	0.40	-
5.	Economics	0.50	0.30
6.	International relation	0.50	-
7.	History	0.50	-
8.	Philosophy	0.40	-
9.	Library Science	0.40	-
10.	Geology	1.00	*3.50
11.	Chemistry	1.00	*4.00
12.	Physics	1.00	@2.50
13.	Mathematics	1.00	-
14.	Central Library	4.00	0.10
15.	Central Instrumentation Laboratory	-	5.00
	Total:	11.70	15.40

* including Rs. 0.50 lakh for repair & maintenance.

@ including Rs.1.00 lakh for Solid State Physics Lab.

ANNEXURE - II

Jadavpur University

Amount approved for building/furniture during the V Plan Period
(All figures are in lakhs of Rupees and represent only UGC Share)

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S.No.	Department/Item	Building
1.	Teachers quarters	2.50
2.	Class IV quarters	1.75
3.	Science Block	1.35
4.	Improvement and renovation of existing hostels	2.00
5.	Extension Lib. building including Museum building	2.00
6.	Campus development and improvement of water supply facilities.	2.50
	Total -	12.10

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ANNEXURE III

JADAVPUR UNIVERSITY

Amount approved for Miscellaneous Schemes during the V Plan period (All figures are in lakhs of rupees and represent UGC share.)

S.No.	Item.	Amount approved
1.	Seminars (Economics Deptt.)	0.05
2.	Field work and contingencies (Geology deptt	0.08
3.	Visiting Faculty	1.50
4.	Publication of Research work	1.00
5.	Use of outstation Research facilities.	1.00
6.	Extension lectures and Seminars.	1.00
7.	Extension of building and equipment for Health Centre.	0.75
	Total:	5.38

ANNEXURE IV

JADAVPUR UNIVERSITY

Staff approved during the V Plan period

S.No.	Deptt.	Posts	Specialisation
1.	English	1P	English language Teaching
2.	Comparative Literature	2L	One in Hindi and the other in Tamil
3.	Bengali	1R	Modern literature
4.	Economics	1P	Public Finance
		2R	One in Public Economics and the other in Industrial Economics.
5.	International relations	1L	Political theory
6.	Philosophy	2R	One in Indian logic and the other in Philosophy of Sciences/Moral Philosophy
7.	Library Science	1L	Open
8.	Geology	1P	Structural Geology
		1R	Coal Geology
		1L	Exploration Geophysics
		2T.P.	1. Senior draftsman and 2. Photographic Asst.
9.	Chemistry	1R	Photo chemistry
		4T.P.	Technical Assts. for Lab.
10.	Central Instrumen/ tation Laboratory	2T.P	1. Instrumentation Engineer 1. Tech. Asstt.
11.	Development Officer	1	-
	Total	3P,7R,5L,8T.P. & 1 D.O.	

P Professor
R Reader
L Lecturer
TP Tech. Posts.
DO Development Officer.

Appendix V to item No.7

CALCUTTA UNIVERSITY

Schemes accepted by the University Grants Commission during the V Plan period, (All figures are in lakhs of rupees).

A. Non-recurring

S.No.	Item	Amount approved
1.	Spill-over	22.09
2.	Schemes approved in V Plan before Committee's visit.	3.25
3.	Books & Journals	36.60
4.	Equipment	38.60
5.	Building/Furniture	55.60
6.	Miscellaneous schemes	9.80
		165.94

B. Recurring

i) Staff: 6 Professors, 20 Readers, 10 Lecturers and 17 Tech. posts.

ii) Fellowships. Fifty junior Research fellowships of the value of Rs.400 per month at any given time to be operated as per UGC rules.

Details are given in Annexures I to IV.

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Annexure - I

CALCUTTA UNIVERSITY

Grants approved for books & Journals and Equipment during the Fifth Plan period. All figures are in lakhs of Rupees and represent UGC share. The amount includes the basic grants of Rs.7 lakhs for books and Rs.10.5 lakhs for equipment already approved by the Commission during the Fifth Plan Period.

S. No.	Department	Books & Journals	Equipment II
1.	English	0.30	0.20
2.	Urdu	0.10	-
3.	Bengali	0.30	-
4.	Hindi	0.30	-
5.	Arabic/Persian	0.10	-
6.	Sanskrit	0.30	-
7.	Pali	0.05	-
8.	Philology	0.30	0.30
9.	Foreign Languages	0.50	-
10.	Library Science	0.30	-
11.	Education	0.50	-
12.	Economics	0.50	-
13.	History	0.50	-
14.	Ancient Indian History	0.30	-
15.	Islamic History & Culture	0.30	-
16.	Archaeology	0.30	-
17.	Museology	0.25	-

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S. No.	Department	Books & Journals I	Equipment II
18.	Philosophy	0.40	-
19.	Political Science	0.40	-
20.	Commerce	0.75	0.10
21.	Law	0.40	-
22.	Botany	1.00	2.00
23.	Zoology	1.00	3.50
24.	Physics	1.00	5.00
25.	Applied Math.	0.30	0.75
26.	Pure Mathematics	0.75	0.20
27.	Statistics	0.50	0.20
28.	Chemistry	1.00	4.50
29.	Physiology	1.00	3.00
30.	Bio-chemistry	1.00	3.00
31.	Geology	1.00	1.75
32.	Pure Psychology	0.50	0.70
33.	Applied Psychology	0.50	0.70
34.	Anthropology	0.30	0.30
35.	Geography	0.60	1.00
36.	Sociology	0.50	0.20
37.	Food & Nutrition	0.50	0.75
38.	Central Instrumentation Labs.	-	7.00
39.	Central Animal House	-	0.75

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S. No.	Department	Books & Journals I	Equipment II
40.	Central Workshop	-	2.50
41.	Central Library & Campus Libraries	18.00	0.20
		36.60	38.60

ANNEXURE - II

Jadavpur University

Amount approved for building/furniture during the V Plan Period
(All figures are in lakhs of Rupees and represent only UGC Share)

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S.No.	Department/Item	Building
1.	Teachers quarters	2.50
2.	Class IV quarters	1.75
3.	Science Block	1.35
4.	Improvement and renovation of existing hostels	2.00
5.	Extension Lib. building including Museum building	2.00
6.	Campus development and improvement of water supply facilities.	2.50
	Total -	12.10

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ANNEXURE III

JADAVPUR UNIVERSITY

Amount approved for Miscellaneous Schemes during the V Plan period (All figures are in lakhs of rupees and represent UGC share.)

S.No.	Item.	Amount approved
1.	Seminars (Economics Deptt.)	0.05
2.	Field work and contingencies (Geology deptt.)	0.08
3.	Visiting Faculty	1.50
4.	Publication of Research work	1.00
5.	Use of outstation Research facilities.	1.00
6.	Extension lectures and Seminars.	1.00
7.	Extension of building and equipment for Health Centre.	0.75
	Total:	5.38

ANNEXURE IV

JADAVPUR UNIVERSITY

Staff approved during the V Plan period

S.No.	Deptt.	Posts	Specialisation
1.	English	1P	English language Teaching
2.	Comparative Literature	2L	One in Hindi and the other in Tamil
3.	Bengali	1R	Modern literature
4.	Economics	1P	Public Finance
		2R	One in Public Economics and the other in Industrial Economics.
5.	International relations	1L	Political theory
6.	Philosophy	2R	One in Indian logic and the other in Philosophy of Sciences/Moral Philosophy
7.	Library Science	1L	Open
8.	Geology	1P 1R 1L 2T.P.	Structural Geology Coal Geology Exploration Geophysics 1. Senior draftsman and 2. Photographic Asst.
9.	Chemistry	1R 4T.P.	Photo chemistry Technical Assts. for Lab.
10.	Central Instrumen/ tation Laboratory	2T.P	1. Instrumentation Engineer 1. Tech. Asstt.
11.	Development Officer	1	-
	Total	3P,7R,5L,8T.P. & 1 D.O.	

P Professor
R Reader
L Lecturer
TP Tech. Posts.
DO Development Officer.

Appendix V to item No.7

CALCUTTA UNIVERSITY

Schemes accepted by the University Grants Commission during the V Plan period, (All figures are in lakhs of rupees).

A. Non-recurring

S.No.	Item	Amount approved
1.	Spill-over	22.09
2.	Schemes approved in V Plan before Committee's visit.	3.25
3.	Books & Journals	36.60
4.	Equipment	38.60
5.	Building/Furniture	55.60
6.	Miscellaneous schemes	9.80
		165.94

B. Recurring

i) Staff: 6 Professors, 20 Readers, 10 Lecturers and 17 Tech. posts.

ii) Fellowships. Fifty junior Research fellowships of the value of Rs.400 per month at any given time to be operated as per UGC rules.

Details are given in Annexures I to IV.

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Annexure - I

CALCUTTA UNIVERSITY

Grants approved for books & Journals and Equipment during the Fifth Plan period. All figures are in lakhs of Rupees and represent UGC share. The amount includes the basic grants of Rs.7 lakhs for books and Rs.10.5 lakhs for equipment already approved by the Commission during the Fifth Plan Period.

S. No.	Department	Books & Journals I	Equipment II
1.	English	0.30	0.20
2.	Urdu	0.10	-
3.	Bengali	0.30	-
4.	Hindi	0.30	-
5.	Arabic/Persian	0.10	-
6.	Sanskrit	0.30	-
7.	Pali	0.05	-
8.	Philology	0.30	0.30
9.	Foreign Languages	0.50	-
10.	Library Science	0.30	-
11.	Education	0.50	-
12.	Economics	0.50	-
13.	History	0.50	-
14.	Ancient Indian History	0.30	-
15.	Islamic History & Culture	0.30	-
16.	Archaeology	0.30	-
17.	Museology	0.25	-

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S. No.	Department	Books & Journals I	Equipment II
18.	Philosophy	0.40	-
19.	Political Science	0.40	-
20.	Commerce	0.75	0.10
21.	Law	0.40	-
22.	Botany	1.00	2.00
23.	Zoology	1.00	3.50
24.	Physics	1.00	5.00
25.	Applied Math.	0.30	0.75
26.	Pure Mathematics	0.75	0.20
27.	Statistics	0.50	0.20
28.	Chemistry	1.00	4.50
29.	Physiology	1.00	3.00
30.	Bio-chemistry	1.00	3.00
31.	Geology	1.00	1.75
32.	Pure Psychology	0.50	0.70
33.	Applied Psychology	0.50	0.70
34.	Anthropology	0.30	0.30
35.	Geography	0.60	1.00
36.	Sociology	0.50	0.20
37.	Food & Nutrition	0.50	0.75
38.	Central Instrumentation Labs.	-	7.00
39.	Central Animal House	-	0.75

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S. No.	Department	Books & Journals I	Equipment II
40.	Central Workshop	-	2.50
41.	Central Library & Campus Libraries	18.00	0.20
		36.60	38.60

Annexure II

CALCUTTA UNIVERSITY

Grants approved for building/furniture and miscellaneous schemes during the V Plan period. All figures are in lakhs of rupees and represent UGC share.

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Sr.No.	Item	Amount approved
1.	Sociology Department (furniture)	0.10
2.	Extension of Science building	23.50
3.	Extension of Humanities/ Social Sciences building	19.00
4.	Staff Quarters for teachers	8.00
5.	Improvement of facilities in the existing hostels.	3.00
6.	Furnishing the Guest House	1.00
7.	Shed for Central Workshop	1.00
	Total :	55.60

Annexure III

CALCUTTA UNIVERSITY

Amount approved for Miscellaneous schemes during the V Plan period. All figures are in lakh of rupees and represent UGC share.

S. No.	Item	Purpose	Amount approved	
1.	English Department	Seminars etc.	0.25	
2.	Economics Department	Field work	0.10	
3.	Archaeology Department	Excavation and Field trips	0.20	
4.	Museology Department	1. Field work 2. M.A. Scholarships	0.30 0.45	
5.	Botany Department	Green House and Cold Room	2.00	
6.	Applied Maths.	Seminars etc.	0.50	
7.	Biochemistry	Seminars etc.	0.50	
8.	Geology Deptt.	1. Jeep	0.30	(on 50:50 basis)
		2. Field work & contingencies	0.30	
9.	Geography Deptt.	Jeep	0.30	(on 50:50 basis)
10.	Faculty Improvement Programme	-	2.00	
11.	Visiting Faculty		1.00	
12.	Use of out-station res. facilities	-	0.50	
13.	Seminars, Symposia & Workshops etc.	-	1.00	
14.	Contingencies for Central Workshop	-	0.10	
		Total :	9.80	

Annexure -IV

CALCUTTA UNIVERSITY

Staff approved during the Fifth Plan Period

S.No.	Department	Posts	Specialisation
1.	English	1 R	Comparative Literature
2.	Urdu	1 R	Open
3.	Bengali	1 L	Open
4.	Hindi	1 R	Open
5.	Sanskrit	1 L	Open
6.	Foreign Languages	2 L	German/Russian
7.	Education	1 R	Open
8.	Economics	1 R	Public Economics/Industrial Economics
9.	History	1 P	Economic & Social History
		1 L	Open
10.	Museology	1 R	Biological Sciences
11.	Philosophy	1 L	Open
12.	Pol. Science	1 R	Open
		1 L	Open
13.	Commerce	1 P	Accounting
		1 R	Functional areas of business/ Industrial Sociology/Industrial relations/Personnel Management & Marketing.
14.	Law	1 R	Open
15.	Botany	1 R	Molecular Radiation Biology/ Ultrastructure.
		1 T.P	Technical Assistant for Tissue culture/Radiation Lab.
16.	Zoology	2 R	1. Comparative Endocrinology. 2. Protozoology/Parasitology
		3 T.P.	Two Technical Assistants and one Animal keeper.

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S.No.	Department	Posts	Specialisation
17.	Physics	2 R	Experimental Solid State/ Practical Solid State/ Biophysics.
18.	Applied Math.	1 P	Theoretical Physics
		1 R	Cybernetics/Ocenography/ Operational research.
		1 L	Open
19.	Pure Math.	1 R	Only if an integrated course in Mathematics is started.
20.	Statistics	1 L	Open
21.	Chemistry	1 R	Solid State Chemistry/Photo Chemistry/Organo Metallic Chemistry
		2 T.P.	Technical Assistants - one for Organic and one for inorganic Chemistry.
22.	Physiology	1 T.P.	Technical Assistant
23.	Biochemistry	1 P	Nutrition.
24.	Geology	1 P	Igneous & metamorphic petrology /Micropaleantology.
25.	Pure Psychology	1 T.P.	Animal Keeper.
26.	Applied Psychology	2 T.P.	1. Photographer-cum-Artist. 2. Mechanic.
27.	Anthropology	1 R	Applied Anthropology/Physical Anthropology.
28.	Geography	1 P	Social Geography
29.	Sociology	1 R	Social Anthropology/Sociometry
		1 L	Open
30.	Food & Nutrition	1 R	Foods
31.	Central Instrumentation Lab.	4 T.P.	1. Instrumentation Engineer. 2. Three Technical Assistants.

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S.No.	Department	Posts	Specialisation
32.	Animal House	1 T.P.	Animal Keeper
33.	Central Workshop	2 T.P.	1.Supervisor 2.Mechanic

6P, 20R, 10L & 17 T.P.

P:- Professor

R:- Reader

L:- Lecturer

T.P:- Technical Posts.

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Appendix 'VI to Item No. 8

Indian Institute of Science

VTH PLAN ALLOCATION APPROVED (U.G.C. SHARE)

		(Lakhs of Rupees)	
1.	Recurring	65.00 (For Plan period)	(Annexure I)
2.	Non-recurring		
2.1	Equipment as central facilities (Committed)	106.00	(Annexure II)
2.2	Equipment as Central facilities	93.00	(Annexure III)
2.3	Equipment for individual departments	80.00	(Annexure IV)
2.4	Buildings and Campus development	108.00	(Annexure V)
		387.00	

Total Recurring	65.00
Total Non-recurring	387.00
Total Outlay on V Plan	452.00

Annexure 'I'

Indian Institute of Science

Recurring

(Figures in lakhs of rupees)

1.	Spill-over from IV Plan projects	20.00
2.	Centre for Electronics Design Technology	10.00
3.	Molecular Biophysics Unit	2.00
4.	Working expenses for interdisciplinary Projects	5.00
5.	Additional working expenses	10.00
6.	Provision for essential posts	12.00
7.	Support for continuing education	6.00
		65.00 Lakhs

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Annexure II

Equipment as central facilities
(Committed)

Non-recurring

(Figures in lakhs of Rupees)

1.	Computer expansion	22.00
2.	Computer expansion II Phase	25.00
3.	Cryogenic facilities	20.00
4.	Single crystal X-ray diffractometer	14.00
5.	Hybird computer	25.00
		106.00 Lakhs.

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Annexure III

Indian Institute of Science
Equipment as Central facilities

Non-recurring

(Figures in lakhs of Rupees)

1.	Library (Books & Equipment)	12.00
2.	Instrumentation Projects	5.00
3.	General Research equipment	25.00
4.	Solid State Electronics and Materials Science Programme	25.00
5.	Workshop facilities	20.00
6.	Graphic Arts facilities	1.00
7.	Molecular Biology and Bio-Engineering	2.00
8.	Central stores (Inventory build-up)	3.00
	Total -	93.00

Annexure IV

Indian Institute of Science
Equipment for individual departments

Non-recurring

(Figures in lakhs of Rupees)

1. Division of Physics and Mathematical Sciences:	
1.1 Applied Mathematics	0.50
1.2 Central Instruments & Services Laboratory	2.00
1.3 Centre for Theoretical Studies	0.50
1.4 Foreign Language Section	0.50
1.5 Physics	2.50
	6.00
2. Division of Chemical and Biological Sciences	
2.1 Biochemistry	3.00
2.2 Inorganic and Physical Chemistry	3.00
2.3 Microbiology & Cell Biology Laboratory	1.50
2.4 Molecular Biophysics Unit	8.00
2.5 Organic Chemistry	2.00
2.6 Central Animal Facility	0.50
	18.00
3. Division of Electrical Sciences	
3.1 Electrical Communication Engg.	5.00
3.2 Electrical Engineering	5.00
3.3 High Voltage Engineering	5.00
3.4 School of Automation	9.00
	24.00

4.	Division of Mechanical Sciences	
4.1	Aeronautical Engineering	5.00
4.2	Chemical Engineering	5.00
4.3	Civil Engineering	5.00
4.4	Industrial Management	1.00
4.5	Mechanical Engineering	7.00
4.6	Metallurgy	8.00
		31.00
5.	Health Centre	1.00
	Grand Total	80.00

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Annexure V

Indian Institute of Science
Buildings and Campus development

Non-recurring.

(Figures in lakhs of Rupees)

I.	Spill-over from IV Plan Projects	19.00
II.	For new projects as detailed below :-	
(a)	Renovation of old Buildings Biochemistry, Inorganic & Physical Chemistry, Physics Including stores.	20.00
(b)	New Buildings:	
	Central Laboratory Complex for materials and electronics	30.00
	Molecular Biophysics	8.00
	Hostel facilities for students and continuing education	15.00
(c)	Campus development:	
	Completion of periphery wall and augmentation of water and power supply facilities.	11.00
(d)	Student amenities	5.00
	Total	108.00

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Appendix VII to Item No.27

For future recruitment to the posts of Lecturers in Universities, the minimum qualifications shall be as may be determined by the University Grants Commission which are as follows:

University Lecturers

(a) A Doctor's degree or research work of an equally high standard; and

(b) consistently good academic record with 1st or high 2nd class B (in the seven point scale) Master's degree in a relevant subject or an equivalent degree of a foreign university.

Having regard to the need for developing inter-disciplinary programmes, the degrees in (a) and (b) above may be in relevant subjects.

Provided that if the Selection Committee is of the view that the research work of a candidate as evident either from his thesis or from his published work is of very high standard, it may relax any of qualifications prescribed in (b) above.

Provided further that if a candidate possessing a Doctor's degree or equivalent research work is not available or is not considered suitable, a person possessing a consistently good academic record (weightage being given to M.Phil. or equivalent degree or research work of quality) may be appointed provided he has done research work for at least two years or has practical experience in a research laboratory/organisation on the condition that he will have to obtain a Doctor's degree or give evidence of research work of equivalent high standard within five years of his appointment, failing which he will not be able to earn future increments until he fulfils these requirements.

Explanation:

1. Candidates for being elligible for recruitment to the posts of Lecturers must have a 1st or high Second Class B (in the seven point scale) at the Master's level and for determining consistently good record, average of 50-55% or B (in the seven point scale) may be expected at the two examinations prior to the Master's examination.

The following two examples would illustrate the above:

(1) A candidate who has obtained 52% marks at the Higher Secondary/Pre-University/Intermediate and 58% at the Degree Level would have an average of 55% and as such could be considered.

p.t.o.

(11) A candidate who has obtained 60% at Higher Secondary/Pre-University/Intermediate and 44% at the Degree level would have an average of 52% and as such could be considered.

CONFIDENTIAL

(22)

UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976.

Item No. 8 : To consider the Report of the Visiting Committee appointed by the U.G.C. for assessing the development needs of Indian Institute of Science, Bangalore, during the V Five Year Plan period.

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The University Grants Commission appointed a Visiting Committee with Shri K.T. Chandy as Convenor, for examining the development proposals of the Indian Institute of Science, Bangalore, during the Fifth Five Year Plan period.

The Committee visited the Institute from 19th to 21st January, 1976. The Committee held discussions with the Director, Registrar, and Deans of Faculties on the various aspects of the functioning of the Indian Institute of Science and on the underlying philosophy in the various proposals made for consideration of the Committee. The Institute authorities drew attention of the committee to the recommendations of the Review Committee appointed by the Visitor under the Chairmanship of Professor T.R. Seshadri. The Reviewing Committee recommendations have been accepted by the Government with the direction that the Council may implement them. It became apparent to the Committee that because of the limited funds, it would not be possible for the Institute for fully implement the Review Committee's recommendations in the course of a Single Plan Period. A summary of the recommendations of the Fifth Plan Visiting Committee is given below :-

There was general agreement that notwithstanding the individual sub-group recommendations, within a broad classification of allocations, substantial freedom should be available to the Institute authorities in the expenditures to be incurred, and recruitment of Staff. This has become all the more necessary since the funds likely to be available are far less than the original tentative allocation. The recommendations have been given in the form of 1st and 2nd priority. The sum total of the first priority amounts to Rs. 452 lakhs and second priority Rs. 198 lakhs.

Division of Physical and Mathematical Sciences

The Division has as its main research activities, fundamental and applied work in Mathematical and Physical Sciences. The Committee has noted with satisfaction the innovation of this Division in the M.Tech. programme in Physical Engineering which seems to have filled an important need in the country.

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Division of Chemical and Biological Sciences

The Committee was impressed with the ever good work being done by the Faculty and research scholars despite serious handicaps in regard to facilities and space.

The Division hasmajor research interests in the synthesis and preparation of compounds, crystal and molecular structure, reaction mechanisms and biological metabolism. It has also developed links with the groups on materials science, molecular biology and bio-engineering.

Division of Electrical Sciences

The Committee is happy to note the re-organisation and feels that this is a very desirable way of coordinating the teaching and research in this closely related areas. This approach should result in better resources utilisation, avoidance of redundancy in teaching effort and in eliminating overlapping equipment needs. It is expected that in the near future the gains will become visible because of the coherent and close interactive approach amongst the Faculties of the Division resulting in better teaching and research output.

The Committee has been highly impressed by the commitment of the School of Automation in giving an industrial orientation to their programme with a view to making their teaching and research relevant from the national angle. Even as a young department it has started attracting significant projects from outside agencies.

Division of Mechanical Sciences

The Committee noted with satisfaction the useful role played by the various departments which form the Mechanical Sciences Division. The Committee feels that there is much more that can be done by the Division to satisfy the country's immediate and future requirements through sponsored research and consultancy.

The Institute has contributed enormously to the growth of Science and Technology in the country. It has, over the years, supplied substantial manpower to the academic institutions, research laboratories, industry and to some extent to the administrative organs of the Government. Over the period of years, technological obsolescence has overtaken the Institute's research equipment. Many of the older buildings are in urgent need of substantial repairs. Maintenance of a high level in teaching and research in Science and Technology cannot be carried on without first-rate equipment and supporting facilities. Removal of technological obsolescence in th Institute's research facilities, provision of some new buildings and renovation of the old buildings, deserve to receive the highest priority in the utilisation of funds during the Fifth Plan period.

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The extent of technological obsolescence and the state of dilapidation of the older buildings and in view of the limited funds it is apparent that the inadequacy cannot be removed during the Fifth Plan period itself and that this task has to be taken up in stages.

The buildings housing the older departments are in urgent need of substantial repairs. There is the possibility of renovation and also obtaining additional accommodation by providing one more floor in some parts of these buildings. Such a programme will provide a measure of modernisation of the existing facilities. The renovation is recommended for the Biochemistry Department, Inorganic and Physical Chemistry Department and the Physics Department including Stores in that order. The Committee has recommended a provision of Rs. 20 lakhs for this on first priority basis with an additional Rs. 20 lakhs under the second priority.

The Committee strongly recommends provision of new buildings for research in Molecular Biophysics which has had a good start. Provision of Rs. 8 lakhs is recommended for this building during the Current plan period under first priority with another Rs. 4 lakhs on second priority.

There is a need for additional hostel facilities for accommodating more students for regular courses as well as for continuing education. For this the committee recommends a provision of Rs. 15 lakhs during the current Plan under first priority.

The campus development which includes completion of the periphery wall and augmentation of the water and power supply facilities (of which a major portion will be needed for renovating power wiring in the departments) will require a sum of Rs. 11 lakhs under first priority during the Plan period and about Rs. 5 lakhs on second priority basis. The Committee also recommends a provision of Rs. 5 lakhs for student amenities to provide for some essential needs in the Gymkhana. Accommodation for staff is getting to be a serious problem for the Institute.. The Committee recommends a sum of Rs. 17 lakhs for building staff quarters under Second priority.

The committee recalls the recommendations of the Review Committee which has stressed the importance of restoring balance between the emphasis laid on the development of research in the Divisions dealing with science and what has been given to the development of research in engineering at the Institute so that the relative neglect of research in the basic sciences which has prevailed for some time is eliminated. The re-emphasis is needed, not as an end in itself but because development in modern technologies are very strongly influenced by researches in scien sciences. Provision of sophisticated and modern scientific equipment offe powerful tools for interaction of the science departments of the Institute with engineering departments and influence the growth of science-based

technological research in the Institute. It is also expected that in this process, science departments will, over the years, shift the emphasis from pure to applied scientific research in the Institute. The Committee recommends that as far as possible emphasis may be given to obtaining sophisticated scientific equipment which will be equally useful for both science and engineering departments of the Institute.

Details of provision under buildings and campus developments are as under :-

		First Priority (Figures in lakhs of rupees)	Second Priority (Figures in lakhs of rupees)
I.	Spill-over from IV Plan Projects	19.00	
II.	For new projects as under:		
	(a) Renovation of old buildings:		
	Biochemistry, Inorganic & Physical Chemistry, Physics including Stores.	20.00	20.00
	(b) New Buildings:		
	Central Laboratory Complex for materials and electronics	30.00	30.00
	Molecular Biophysics	8.00	4.00
	Hostel facilities for students and continuing education	15.00	-
	(c) Campus development:		
	Completion of periphery wall and augmentation of water and power supply facilities	11.00	5.00
	(d) Student amenities	5.00	-
	(e) Additions to staff housing	-	17.00
	Total -	89.00	76.00

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Provisions under equipment as Centralised Facilities

The Committee considers it of highest importance to give priority to these facilities. During the Fourth Plan perioditself commitments had already been made to the extent of Rs. 106.00 lakhs as detailed below :-

		Figures in lakhs of rupees
1.	Computer expansion which is completed	Rs. 22.00
2.	Computer expansion II phase (under process)	Rs. 25.00
3.	Cryogenic facilities	Rs. 20.00
4.	Single crystal X-ray diffractometer	Rs. 14.00
5.	Hybrid computer	Rs. 25.00
	Total	Rs.106.00

The above commitments are the first charge on the provision during the current Plan period.

The Institute authorities stressed the importance of additions to the library and graphic art facilites including reprography etc. The students drew the attention of the committee to the necessity to provide multiple copies of books in the library. Taking in-to account the facilities available elsewhere in Bangalore, e.g., at the National Aeronautical Laboratory, the Committee considers that the proposals of the Institute as modest and approves an investment of Rs. 12.00 lakhs in the library on first priority and Rs. 3.00 lakhs on second priority and Rs. 1.00 lakh on first priority and Rs. 2.00 lakhs on second priority for Graphic Arts facilities.

The Committee recommends a sum of Rs. 25.00 lakhs for augmentation of Central Facilities by way of general research equipment on first priority and another Rs. 25.00 lakhs on second priority. The Committee wishes to stress the importance of having fully trained teachnicians rendering services on these centralised facilities and users' committees may be set up for deciding policy of utilisation. Where an expensive facility is required by one department to a much greater extent than the other departments, there may not be any objection in locating such a facility in that department provided a users' committee would be responsible for the mode of utilisation of the facility.

The Committee has noted with interest the strong emphasis laid down in the fields of materials science and electronics, molecular biology, bio-engineering and coordinated mechanics. An investment of Rs. 25 lakhs on 1st priority and Rs. 15 lakhs on second priority for Materials Science is recommended.

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lakhs under second priority as follows :

		Ist Priority	IInd Priority
		(Rupees in lakhs)	
1.	Division of Physics and Mathematics Sciences		
1.1.	Applied Mathematics	0.50	0.50
1.2	Central Instruments & Services Laboratory	2.00	1.00
1.3.	Centre for Theoretical Studies	0.50	-
1.4	Foreign Languages Section	0.50	0.50
1.5	Physics	2.50	2.00
		6.00	4.00
2.	Division of Chemical and Biological Sciences		
2.1	Biochemistry	3.00	-
2.2	Inorganic and Physical Chemistry	3.00	2.00
2.3	Microbiology & Cell Biology Laboratory	1.50	1.00
2.4	Molecular Biophysics Unit	8.00	-
2.5	Organic Chemistry	2.00	1.00
2.6	Central Animal Facility	0.50	-
		18.00	4.00
3.	Division of Electrical Sciences		
3.1	Electrical Communication Engineering	5.00	5.00
3.2	Electrical Engineering	5.00	3.00
3.3	High Voltage Engineering	5.00	3.00
3.4	School of Automation	9.00	1.00
		24.00	12.00

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4.	Division of Mechanical Sciences			
	4.1	Aeronautical Engineering	5.00	5.00
	4.2	Chemical Engineering	5.00	3.00
	4.3	Civil Engineering	5.00	3.00
	4.4	Industrial Management	1.00	-
	4.5	Mechanical Engineering	7.00	3.00
	4.6	Metallurgy	8.00	2.00
			31.00	16.00
5.	Health Centre		1.00	-
		Grand Total	80.00	36.00

Provision under Recurring

The Committee notes that the Institute is reasonably well provided with Faculty although some lacunae was observed in some of the departments. Emphasis should be given to applied sceiences and to develpping higher levels interaction between science and engineering departments. This may require recruitment of some additonal staff selectively. The Review Committee had recommended that the Department of Industrial Management may take initiative to increasingly orient its activities towards R&D. The Committee feels that studies related to investment decisions, such as, choice of technology, scale of operations, choice of location, project management, etc. should also become an important part of such endeavour and recommends recruitment of two or three additional staff to assit the Department of Industrial Management to reorient its current activities and give courses to the students graduating in engineering & technology.

The Committee recommends a sum of Rs. 12 lakhs in first priority and Rs. 3 lakkhs in second priority during the Plan period for filling up of essential posts and a sum of Rs. 6 lakhs for continuing education on first priority.

Thus, the provisions under Recurring are as follows :-

		Ist Priority	IInd Priority
1.	Spill-over from IV Plan projects	20.00	-
2.	Centre for Electronics Design Technology	10.00	-

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3.	Molecular Biophysics Unit	2.00	-
4.	Working expenses for inter-disciplinary projects	5.00	1.00
5.	Additional working expenses	10.00	5.00
6.	Provision for essential posts	12.00	3.00
7.	Support for continuing education	6.00	-
		65.00	9.00

GENERAL RECOMMENDATIONS

The Committee looked into one of the important recommendations of the Reviewing Committee. This is in regard to the undergraduate programme. The Reviewing Committee has recommended that the Institute authorities may take a very careful view about the continuation of the undergraduate programme. It was clear that the divided opinion that existed at that time in the Institute still continues. The Reviewing Committee recommended that if the undergraduate programmes were to continue they cannot be patterned after the existing undergraduate programmes being given elsewhere but should set a pattern of their own. With the coming of the Institutes of Technology giving strong undergraduate programmes, necessity for the Institute to transform their undergraduate programme has become even more urgent. It would appear, while in the Electronics and Electrical Engineering departments some transformation has taken place in the course content, the same cannot be said of the programme in the Metallurgy Department. The Committee therefore recommends a continuous review of the course programme in the Electronics and Electrical Engineering departments to introduce new courses to meet the changing needs of the country. It further recommends closing down the present undergraduate programme in the Metallurgy Department at any early date.

The Committee noted with deep satisfaction the manner in which some of the departments of the Institute sought research schemes from various organisation. This has given valuable additional working funds and research fellowships, for the staff to carry on scientific research. There are several agencies giving funds for research. Paucity of funds for scientific research is likely to be a continuing problem in the years to come. The external agencies, by and large, tend to give funds to support research which is in some sense of national relevance. In order that the research in the Institute may be even purposeful and that more working funds may be obtained, it is recommended that the various departments of the Institute may more aggressively seek support from external agencies for scientific research. The Committee also suggests that the Institute authorities take a good look into the research activities of the various Divisions to see if they are spread a little too thin in some areas without adequate support.

P.T.O.

Consequent to the creation of the Divisions, the Committee noted with interest the efforts to evolve common courses among the various departments belonging to the same Division. The Committee fully supports this venture which will reduce the load on the Faculty in the teaching programme and enable them to spend more time on fruitful research and offer more electives.

The Committee is really happy to record its appreciation of the discussions it had with the student representatives. The motivation with which the students pursue their higher studies along with extra curricular activities is indeed a tribute to the Institute authorities.

The Committee recommends the provision of a sum of Rs. 5 lakhs for students' amenties for providing cine project facilities at the Gymkhana and improvement in the foot-ball, volley-ball, hockey and play grounds, swimming pool, health centre, etc. There is an urgent necessity for additional hostel accommodation for housing the regular students and for continuing education participants. A non-recurring provision of Rs. 15 lakhs is recommended under first priority as indicated under provision for buildings.

The Committee was happy to note the creation of Alumni Association. A token grant of Rs. 5,000/- as non-recurring for the Allumni Association has been recommended.

FINANCIAL IMPLICATIONS

The Committee recommends a total outlay of Rs. 650 lakhs for the development of teaching and research at the Indian Institute of Science, Bangalore. This includes the spill-over from the Fourth Plan as well as grants already approved by the Commission after 31.3.1974. The total outlay consists of Rs. 452 lakhs under First Priority and Rs. 198 lakhs under Second Priority, as per details given below:

		I Priority	II Priority
		(Figures in lakhs of Rs.)	
1.	Recurring	65.00	9.00
2.	Non-Recurring		
2.1	Equipment as central facilities (committed)	106.00	-
2.2	Equipment as Central facilities (recommended)	93.00	77.00
2.3	Equipment for individual departments (recommended)	80.00	36.00
2.4	Buildings and Campus development (includes spill-over projects from IV Plan)	108.00	76.00
		387.00	189.00
	Total Recurring	65.00	9.00

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Total Non-Recurring	387.00	189.00
Total Outlay on V Plan (1st Priority + Second Priority)	452.00 +	198.00

= Rs. 650.00 lakhs

The Report of the Visiting Committee is attached (Annexure).

The matter is placed before the Commission for consideration.

JS (II)

REPORT OF THE FIFTH PLAN VISITING COMMITTEE OF INDIAN INSTITUTE OF SCIENCE, BANGALORE.

UNIVERSITY GRANTS COMMISSION
NEW DELHI

C O N T E N T S

UNIVERSITY GRANTS COMMISSION

REPORT OF THE VISITING COMMITTEE PERTAINING TO DEVELOPMENT OF TEACHING AND RESEARCH IN THE FACULTIES OF ENGINEERING/ TECHNOLOGY AND IN SCIENCES DURING THE FIFTH FIVE YEAR PLAN AT THE INDIAN INSTITUTE OF SCIENCE, BANGALORE (19 - 21 JANUARY 1976).

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PART - I

INTRODUCTION

The University Grants Commission constituted a Visiting Committee with the following members for examining and assessing the developmental programmes of the Indian Institute of Science, Bangalore, pertaining to the Faculties of Engineering/Technology and Sciences during the Fifth Five Year Plan :

Convener: Shri K.T. Chandy
Chairman
Kerala State Industrial Development
Corporation Ltd.
Vellayambalam
Trivandrum-1

DIVISION - PHYSICAL & MATHEMATICAL SCIENCES

1. Professor Chanchal Mazumdar
Department of Pure Physics
Calcutta University
Calcutta.

2. Dr. P.K. Katti
Officer on Special Duty
(Incharge Instrument Development Division)
Department of Science & Technology
New Mehrauli Road
New Delhi-110057.

3. Professor M.P. Singh
Department of Mathematics
Indian Institute of Technology
Delhi.

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DIVISION - CHEMICAL & BIOLOGICAL SCIENCES

1. Professor R.C. Mehrotra
Vice-Chancellor
Delhi University
Delhi.

2. Professor B.K. Bachhawat
Department of Biochemistry
Christian Medical College & Hospital
Vellore.

3. Professor V. Ramakrishna
Chief Controller Research & Development
Defence Research and Development Organisation
Ministry of Defence
New Delhi.

4. Professor L.S. Ramaswami
Primate Project Director
Institute for Research in Reproduction
(Indian Council of Medical Research)
Jehangir Merwanji Street
Parel, Bombay-400012.

DIVISION - ELECTRICAL SCIENCES

1. Professor N.C. Mathur
Department of Electrical Engineering
Indian Institute of Technology
Kanpur.

2. Professor I.J. Nagrath
Department of Electrical Engineering
Birla Institute of Technology & Science
Pilani.

3. Professor B. Nag
Computer Science
Jadavpur University
Calcutta.

DIVISION - MECHANICAL SCIENCES

1. Professor T.R. Anantharaman
Department of Metallurgy
Institute of Technology
Banaras Hindu University
Varanasi.

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MECHANICAL SCIENCES CONTD....

2. Dr. G.S. Laddha
Director
A.C. College of Technology
Madras.

3. Professor M.C. Gupta
Department of Thermodynamics &
Combustion Engineering
Indian Institute of Technology
Madras.

4. Dr. S.R. Valluri
Director
National Aeronautical Laboratory
Bangalore.

5. Professor S. Narasimhan
Department of Civil Engineering
Indian Institute of Technology
Bombay.

Officer of the Commission

Dr. S.K. Dasgupta
Joint Secretary

The Committee visited the Indian Institute of Science, Bangalore from 19th to 21st January, 1976.

The Indian Institute of Science, was established in 1909 as a new institution of higher learning devoted to research and teaching in Science and Technology. Over the past 65 years since its establishment, the Institute has evolved a distinct All-India character in research and in postgraduate teaching drawing its students and faculty from all parts of the country. The Institute has struck a balance in the correlation of Science, Technology and Industry with the three-fold characteristics :

1. Definition of problems ;
2. Unfolding of new knowledge to obtain solutions; and
3. Application of the results.

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The departments in the Science Faculty place a major emphasis on research, but, they have also now formal Ph.D. training programme besides their involvements in teaching relevant to the needs of the Engineering departments.

The Engineering departments train postgraduate students at the Master's and Ph.D. levels and also undertak research and development projects. The Institute also runs three courses at the B.E. level e.g., Electrical Technology Electrical Communication Engineering and Metallurgy. These courses are distinct from the Engineering degree programme elsewhere as they are open to Graduates in Science and provide them with a bridge to enter Technology in the Engin ing Sciences. There are also two postgraduate courses, e.g in the Department of Industrial Management and in Molecular Bio-physics Unit.

The Visitor of the Institute has been appointing periodically high power Reviewing Committees to review the work of the Institute and advise on its future development. A succession of such Reviewing Committee have assisted the development of the Institute, both in regard to creation of an atmosphere where the sprit of free enquiry so necessary to intellectual activity has been sustained and in giving guidance whereby the work of the Institute has maintained close relevance to national development.

The latest major review of work of the Institute took place during the middle of the Fourth Plan period. The composition of the Reviewing Committee was as under:-

Professor T.R. Seshadri, F.R.S. — Chairman
Emeritus Professor
Department of Chemistry
University of Delhi, DELHI.

Dr. B.K. Bachhawat — Member
Professor of Biochemistry and Director
Neurochemistry Laboratory
Department of Neurological Sciences
Christian Medical College and Hospital
VELLORE 4.

Dr. A.K. Kamal — Member
Professor and Head
Electronics & Communication
Engineering Department
Roorkee University, Roorkee, U.P.

contd...p.5.

Dr. G.S. Laddha Director A.C. College of Technology Madras University, Guindy, MADRAS 25	Member
Prof. K.B. Menon Head of the Electrical Engineering Department Indian Institute of Technology, Kharagpur, P.O. Kharagpur Technology, KHARAGPUR	Member
Dr. S.R. Valluri Director National Aeronautical Laboratory P.B. No. 1779, Kodihalli, BANGALORE 17	Member
Dr. A.R. Verma Director National Physical Laboratory Hillside Road, NEW DELHI 12	Member
Dr. W.H. Pickering Director Jet Propulsion Laboratory California Institute of Technology Pasadena, California, U.S.A.	Adviser
Prof. M.J. Lighthill, F.R.S. Department of Applied Mathematics & Theoretical Physics University of Cambridge Silver Street, Cambridge, ENGLAND	Adviser
Prof. M.M. Shemyakin, Sc. D. Member, USSR Academy of Sciences Director, Institute for Chemistry of Natural Products USSR Academy of Sciences Ul, Vavilova 32, Moscow, USSR	Adviser
Shri G.N. Vaswani Deputy Educational Adviser (Tech.) Ministry of Education & Social Welfare Government of India, NEW DELHI	Secretary

The terms of reference of the Committee were to review the working of the Institute in all its aspects as a centre of advanced studies and research in Science, Engineering and Technology and advise on the broad lines of develop-

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ment of the Institute. A summary of the major recommendations of the Reviewing Committee is as below:

(i) A substantial input for maintenance and modernising equipment and overcoming the obsolescence, which has crept in during the past. It is imperative that the amount of foreign exchange needed for this be treated as an integral part of this input. Simultaneously, there must be an increase in the technical resources of the Institute to design and fabricate research equipment;

(ii) An augmentation of the working expenses to be effected with a sense of urgency for providing the maximum support for the scientific and technological work;

(iii) A functional regrouping of the Institute's disciplines to bring the various departments together in a more effective manner and to encourage greater interactions between various departments of the individual divisions. It would appear that the regrouping would call for creation of about five divisions;

(iv) A planned shift of emphasis towards the physical and chemical sciences to bring about a better balance between the engineering and science discipline and providing a more desirable science-base to the research efforts in the engineering disciplines;

(v) Reorientations in its teaching and research activities in relation to Ph.D. programmes, Master's and Bachelor's degree courses;

(vi) Undertaking certain inter-disciplinary projects, basic competence for which largely exists in the various departments of the Institute and which are of value to the nation as a whole;

(vii) Organising and strengthening the central technical services, including the acquisition of sophisticated equipment for use by more than one department as a central facility;

(viii) Intensifying the programme of visiting scientists and increasing inter-institutional collaboration;

(ix) A strong point of this Institute has been its all-India character. Every effort should therefore, be made to maintain this character specially by way of staff and students.

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The Reviewing Committee, however, mentioned that the recommendations are to be understood as indicating the broad lines for the future development of the Institute. In an established and live institution with a long record of useful work, it is appropriate that only broad indications for its future development are given, leaving it to the institutional processes to implement these with reference to details but keeping in view the spirit of the recommendations".

Keeping in view the above recommendations of the Reviewing Committee, the Council envisaged a three-fold function of the Institute during the coming years as indicated below:

(a) Education and Research : Organisation of advanced instruction and pursuit of research as a continuous process for ensuring the supply of trained scientific manpower at the highest level to meet the needs of the country. The Institute has been engaged in this function throughout the course of its history of over six decades. It has to continue this function and in developing it further, introduce newer areas of activity called-forth by national and international developments in Science and Technology.

(b) Forge strong and active links with other institutions, the Institutes of Technology and the Universities which form components of the total higher education in the country, and also with the National Laboratories, R & D organisations and Scientific Services in the country.

(c) Function as a Centre for Continuing Higher Educati in areas of Science and Technology of direct application to National development.

In pursuance of the recommendations relating to the organisation of the work of the Institute into major divisions, the Institute departments have already been grouped into the following four divisions:

(a) Division of Physics and Mathematical Sciences:

Applied Mathematics
Central Instruments and Services Laboratory
Centre for Theoretical Studies
Foreign Languages
Physics

contd...p.8.

(b) Division of Chemical and Biological Sciences:

Biochemistry
Inorganic and Physical Chemistry
Microbiology & Cell Laboratory
Molecular Bio-physics Unit
Organic Chemistry

(c) Division of Electrical Sciences:

Electrical Communication Engineering
Electrical Engineering
High Voltage Engineering
School of Automation

(d) Division of Mechanical Sciences:

Aeronautical Engineering
Chemical Engineering
Civil Engineering
Industrial Management
Mechanical Engineering
Metallurgy

In addition, there will be planned emphasis on defined inter-disciplinary areas for which support will be provided from the plan finances. These are :

1. Materials Science and Electronics
2. Molecular Biology
3. Bioengineering
4. Coordinated Mechanics

A major central facility contemplated by the Institute during the Fifth Plan period is to set-up a Central Laboratory for Material Sciences and Electronics and strengthening of the fabrication facilities.

A tentative allocation of Rs.6.5 crores has been made for the development of the Institute during the Fifth Five Year Plan classifying the projections under three priorities to represent the first 50 per cent, the next 25 per cent and the remaining 25 per cent.

The activities of the Institute during the Fifth Five Year Plan period have been planned within the framework of the major recommendations of the Reviewing Committee and the views of the Council thereon as approved by the Visitor.

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The recommendations of the Reviewing Committee and the orders of the Visitor thereon relate to the total functioning of the Institute for which grants are derived from non-plan and plan sources. At a functional level, therefore, there is a relationship between the grants under non-plan i.e., the Block Grant of the Institute and the grants under plan finances.

The Government of India has approved of the following non-plan (Block Grant) to the Institute for the five years, 1974-75 to 1978-79:

Year	Block Grants (Rs. in lakhs)
1974-75	210.33
1975-76	209.66
1976-77	219.96
1977-78	228.69
1978-79	236.88
Total for 5 years	1,105.52

The plan allocations of Rs.6.5 crores have been worked out by the Institute keeping the total picture in view as summarised below:

	Rs. in lakhs		
I. Non-recurring		568.00	
(a) For equipment of specialised nature as central facilities at the Institute	276.00		
Augmentation of equipment in departments/ laboratories	115.00		
		391.00	
(b) For buildings and campus development including essential student facilities like hostels		177.00	568.00
II. Recurring for the 5-year period		82.00	
Grand Total		650.00	

contd...p.10.

The break-ups of the Non-Recurring and Recurring expenditure amounting to Rs.6.50 crores under the Fifth Plan have been indicated at Appendix I, II, III & IV.

IMPLEMENTATION OF FOURTH PLAN PROGRAMMES

During the Fourth Plan Period, the Commission approved of an expenditure of Rs.402.05 crores, out of which the Institute utilised an amount of Rs.376.17 crores upto 31.3.1974 The details of the expenditure, approved and utilised are given in Appendix V.

STAFF POSITION AS ON 1.4.1974

The staff in position as on 1.4.1974 is indicated below:

Departments/ Sections	Profs.	Asst. Profs.	Lectrs.	Others Tech. Asst./ Res.Asst.	Total
1.	2.	3.	4.	5.	6.
Science Faculty					
Applied Maths.	3	6	6	1	16
Biochemistry	5	10	4	3	22
Centre for Theoretical Studies	1	2	-	-	3
Foreign Languages	1	2	5	2	10
Inorganic & Physical Chemistry	6	5	5	6	22
Molecular Biophysics Unit	3	3	1	-	7
Microbiology & Cell Biology Laboratory	1	1	3	1	6
Organic Chemistry	4	3	-	6	13
Physics	7	2	1	2	12
Total	31	34	25	21	111

contd...p.11.

Engineering Faculty					
Aeronautical Engg.	9	10	13	11	43
Central Instruments & Services Laboratory	2	2	8	12	24
Chemical Engg.	3	6	6	2	17
Civil Engg.	5	8	6	5	24
Electrical Communication Engineering	8	7	7	-	22
Electrical Engineering	8	4	3	3	18
High Voltage Engineering	2	6	6	6	20
Industrial Management	1	5	1	3	10
Mechanical Engineering	12	14	6	15	47
Metallurgy	3	7	7	1	18
School of Automation	3	8	1	6	18
Total	56	77	64	64	261
Grand Total	87	111	89	85	372

STUDENT ENROLMENT

The enrolment of students in the Faculties of Science and Engineering leading to Ph.D., M.E./M.Tech. and Diploma as on 1.4.1966 and 1.4.1974 is indicated below:

Department/ Sections	Research		M.E./ M.Tech.		Diploma
	1.4.1966	1.4.1974	1.4.1966	1.4.1974	1.4.1974
Science Faculty					
Applied Maths.	27	24	-	-	-
Biochemistry	40	48	-	-	-

contd...p.12.

Foreign Languages	-	I	-	-	-
Inorganic and Physical Chemistry	27	35	-	-	-
Molecular Biophysics Unit	-	12	-	-	-
Microbiology & Cell Biology Lab.	16	19	-	-	-
Organic Chemistry	25	29	-	-	-
Physics	26	34	-	21	-
Total	161	192	-	21	5
Engineering Faculty:					
Aeronautical Engg.	15	15	56	64	-
Chemical Engg.	24	19	21	23	-
Civil Engg.	18	24	60	26	-
Electrical Comm. Engineering	8	17	30	39	4
Electrical Engg.	3	8	40	31	-
High Voltage Engineering	1	8	18	17	-
Industrial Management	11	7	-	-	10
Mechanical Engg.	8	27	86	94	-
Metallurgy	2	18	18	20	-
School of Automation	-	17	-	27	-
Total	90	160	329	341	14
GRAND TOTAL	251	352	329	362	19

RECEIPT AND EXPENDITURE UNDER FOURTH PLAN

Statements indicating the receipts and expenditure under Recurring for the period 1.4.1966 to 31.3.1974 are given at Appendix VI & VII.

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PROGRAMMES FOR DEVELOPMENT UNDER FIFTH PLAN AS PROPOSED BY THE INSTITUTE

INTERDISCIPLINARY PROJECTS - PRESENT PROGRAMMES AND FUTURE TRENDS

In the materials science area, attention has been focused on the preparation of single crystal materials with a distinct bias on industrial and device-oriented applications. The future programmes aim at viable industrial production of fumed silica and sodium dichromate and preparation of Zinc Oxide crystals for transducer and optoelectronic devices and of yttrium Iron Garnet for microwave devices. A project is also underway for the production of graphite-dispersed aluminium base composites by a liquid metallurgy technique. The Group is also engaged in studies on technological forecasting. Studies are underway on characterization of materials by X-ray, thermal analysis, mass-spectrometric and other techniques as well as on property-measurements on these materials by newer techniques involving magnetic resonance, ferro-electricity etc.

The solid state electronics group is concentrating its efforts on solid state devices and on property-measurements relevant to these efforts. Y.I.G. based microwave devices, space-change based devices, thin film distributed element delay lines, and electro-optic light modulators are being studied.

The Group on Bio-engineering is engaged in a study of the following problems:

(a) Membrane studies, dipole mechanism of the nervous system, characterization of anthithrombogenic surfaces etc.

(b) Blood and ion transport phenomena.

(c) Bio-instrumentation involving digital display of skin temperature, blood pressure, heart-rate.

(d) Data processing of bio-signals.

The Group on Molecular Biology plans to coordinate research and training in the following major research areas:

(i) Isolation of receptors for pencillin by techniques of specific affinity chromatography etc.

(ii) Studies on inhibition of antigen - antibody inter-action and purification of antibodies.

contd...p.14.

(iii) Study of non-bonded interactions in biological systems.

(iv) Nuclear magnetic resonance studies on model peptide systems having a bearing on the conformational and chemical bonding aspects of peptide units.

The co-ordinated mechanics programme has laid considerable emphasis on the study of Random vibrations with reference to structures and systems of importance in Aeronautics, rockets and missiles, etc. Seminars and projects are a common feature of these inter-disciplinary programmes which also accommodate external registrants for Ph.D.

The Institute has extended encouragement to several emerging research groups with strong inter-disciplinary base, such as, Earth Sciences, Plasma Physics; Hardware-oriented Research Programmes, Molecular and Physico Chemical aspects of Enzymology and High Energy Solid Propellents.

(a) Earth Sciences

The Earth Sciences group of the Institute has been working on the following areas:

(a) Geochronology of the Archaen formations of Karnataka State - various episodes of emplacement and metamorphism over the wide time interval 3300-800 Million years have been delineated, relevant to the study of mineral deposition and mobile belts.

(b) Trace elements geochemistry and distribution of trace elements in mineral phases and study of sulfide deposits, gold mineralization etc.

The future programme envisages the study in depth of these and the introduction of isotope geochemical techniques.

The work on metereology relevant to the topics, geophysical fluid dynamics and solar - terrestrial relationships and the application of statistical methods to geophysics, has also been substantial.

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(b) Plasma Physics

The work on experimental plasma physics has been concerned with plasma diagnostics using electrical probe and mass spectrometric techniques leading to results on electron density and temperature distribution profiles and ion energy characteristics. The future programme envisages the study of these by supplementary optical spectrographic techniques, especially to experimental study of certain plasma instabilities. This has relevance to vacuum arc and breakdown studies and a distinct bearing on the theoretical work that is concerned with waves and instabilities and various collective modes of plasma behaviour.

(c) Hardware oriented Research Programmes

The main purpose of the hardware oriented programmes is to develop capabilities in instrumentation and techniques that ultimately form the backbone of the country's technological development. Programmes on the development of sophisticated instrumentation for analytical and materials property measurements are already underway. The programme envisages to cover all major fields of instrumentation e.g. vacuum; electronics; optical and major techniques of analytical characterization and property measurements. Procedures have also been laid down for appropriate thesis evaluation in these areas.

(d) Molecular and Physicochemical Aspects of Enzymology

One of the major objectives of this group is to elucidate the molecular mechanisms of enzymo action and the structure-function relationship of regulatory enzymes. Collaborative work with the Molecular Bio-physics Unit in the Department of Biochemistry and Organic Chemistry has shown that the nuclectide pryophosphatase undergoes dimerization on the addition of adenosine 5' - monophos- phate (AMP) and has resulted in the crystallization of the native and the AMP - modified enzymes. The Institute has acquired an automatic x-ray diffractometer for crystal analysis which will enable detailed investigations of the enzyme crystal isolated. Studies are in progress on the bioutilization of several organic compounds, such as, fungicides, pesticides etc. and the chemical events leading to the bio-degradation of these compounds which play a vital role in maintaining the ecological balance in Nature.

contd...p.16.

(e) High Energy Solid Propellents

The objective of this group is to study the solid propellents in a collaborative effort with the Departments of Inorganic and Physical Chemistry, Aeronautical Engineering and Metallurgy. The group has succeeded in increasing substantially the burning rate of solid composite rocket propellents by oxidizer modification. Facilities for the production of micron and sub-micron size aluminium particles have been completed. These activities are supported by the Indian Space Research Organisation and the Ministry of Defence.

I. INSTITUTE'S PROPOSALS FOR DEVELOPMENT OF THE DIVISION OF PHYSICS & MATHEMATICAL SCIENCES UNDER FIFTH PLAN

The Division consists of Departments of Physics, Applied Mathematics, Centre of Theoretical Studies, Central Instrumentation and Services Laboratory, Foreign Languages Section and Computer Centre. The proposals of the individual departments are as below:

DEPARTMENT OF PHYSICS

During the Fourth Plan, the Department of Physics continued its work on Raman, NMR and EPR Spectroscopy, X-ray crystallography and Solid State studies on Semiconductors, Magnetic, Ferroelectric, Optical, Geological and Biological materials. Theoretical Physics was included as a new area under the Fourth Plan.

During the Fourth Plan period, the department has made appreciable contribution in solid state physics and in the fabrication of equipment such as Mass Spectrometer, NMR and ESR.

Under the Fifth Plan, the department proposes to modernise various experimental facilities and to expand activities of the theoretical group so as to promote a close collaboration with other groups. It will be possible for the department to undertake studies on the properties of various kinds of materials, with the acquisition of low temperature facilities (in the liquid helium range) and the anticipated establishment of the Materials Science Laboratory and the Central Instrument Complex in the Institute, special emphasis being assigned to the studies on (a) Superconductivity (b) Phase transition in Solids and liquids (c) Amorphous Systems (d) Biomolecules and (e) Materials under different pressures and temperatures.

contd...p.17.

The present staff strength of the Department consists of 7 Professors, 2 Assistant Professors, 1 Lecturer and 2 Others, and 37 students are working for their Ph.D. (as on 31.3.1974). The major areas of research in the department pertain to: (a) Mass spectrometry and applications (b) Magnetic resonance (c) X-ray crystallography (d) Thermal phenomena (e) Ferroelectric and dielectric phenomena (f) Lasers and Spectroscopy (g) Semi-conductors (h) Theoretical physics. Under each of these major areas 3 to 7 scholars are pursuing their research for Ph.D. under the supervision of the concerned Professor who has specialised in that particular area. Besides this research by scholars in the major areas, the department has also undertaken research work in (a) Cryogenic facilities (b) Crystal growth facilities. Seven of the staff members of the department have worked in other institutions in India or abroad as indicated below:

Name of the staff member	Institution	Subject of Research
1. Prof. K.P. Sinha	Bell Telephone Laboratories New Jersey, USA	Theoretical Physics
2. Prof. R. Srinivasan	University of Vancouver, Canada.	Magnetic Resonance
3. Dr. J. Ramakrishna	University of Oxford and Michigan State University.	Magnetic Resonance
4. Prof. M.A. Viswamitra	University of Oxford, Alberta University, Edminton, Canada and Buffallow Centre of Crystallography, USA	X-ray crystallography
5. Dr. S.V. Subramanyam	Clarendon Laboratory, Oxford.	Low Temperature Physics
6. Prof. P.S. Narayanan	West Germany	Lasers
7. Dr. C.K. Subramanian	Uppsala University, Sweden.	Lasers

contd...p.18.

The department has taken up 16 research schemes as financed by different agencies (CSIR 9 projects; Defence 1 project; PL 480 1 project; Department of Atomic Energy 5 projects). The topics of the projects include Mass spectrometry and applications, Crystal field effects, X-ray crystallography at high and low temperature, Spectroscopic and opitical studies of ferroelectric materials, Recombination processes in semiconductors, Thermal and elastic phenomena near phase transitions, Construction of high temperature single crystal Weisenberg camera and X-ray analysis of crystal upto 1200°C, Geochronology and trace element geochemistry of precambrian rocks of India, Nuclear quadrupole resonance in solids, (financed by CSIR); High field effects in semiconductor(financed by Defence); Development of high pressure techniques and applications (financed under PL 480); Magnetic Resonance studies in crystals, Electron spin resonance, Calorimetry at low temperature, Mass spectrometry and application to solid analysis, Electron spin resonance in solids (financed by the Department of Atomic Energy). The amount sanctioned by the different agencies range between Rs.2,250 to Rs.1,97,600.

Nine scholars have been working with senior research fellowship under CSIR and nine junior fellowships have been awarded by the CSIR, four by UGC, two by Department of Atomic Energy and one by NCERT.

Students have been enrolled in the first year M.Tech. studies and nine are in second year M.Tech.

The department has a small sub-library with 1000 books. The workshop attached to the department has a staff strength of 13 of which 8 are Mechanics (including one glass blower), the rest being laboratory helpers. A small glass blowing facility alsc exists in the department. The major research equipment acquired by the department include Liquid Helium facility (being set-up), Prism Spectrographs, Liquid Helium Plant, Liquid Nitrogen Plant, Micro-densitometer, Perkin Elmer Single Beam IR Spectrometer. Facilities available in other institutions in India, such as BARC, are being utilised by the research/teaching staff of the department. Personnel from BARC and NGRI received training and assistance in Mass spectrometry and Spectrometry of rocks and training has also been given by the department to teachers of various universities in Spectroscopy, NMR, etc. The analytical research facilities at the Central Instruments Laboratory of the Institute are being regularly used by the department by way of collaboration.

contd...p.19.

The main strength of the department has been in the area of fabricating equipment required for its research programmes. The most important of them are listed below:

	Equipment Constructed	Research Use
1.	Nier type mass spectrometers	Geochronology, Solid State Diffusion, Ion Source Studies.
2.	NMR, ESR and NQR Spectrometers	Magnetic and Hyper-fince Interactions in Solids.
3.	Weissenberg Camera, High Temperature Single Crystal Diffractometer	X-ray structure analysis
4.	Thermostats withmilli-degree resolution; ultrasonic pulse set up	Studies on Critical Phenomena
5.	He-Ne and Argon Ion Lasers	Brillouin scattering
6.	Crystal pullers, Zone refining set up, semiconductor apparatus	Semiconductor preparation and property measurement

INTEREST TAKEN IN CONDUCTING RESEARCH SEMINARS OR SUMMER SCHOOLS

Research seminars are regularly held in the department and summer schools are a regular feature. The main conferences held in the past few years are: (a) Symposium on Lattice Dynamics (1968), (b) The Indo-Soviet Conference on Solid State Physics, (1972), (c) The DAE Symposium on Nuclear and Solid State Physics (1973) and (d) The UGC Summer Institute in Theoretical Physics (1974).

STEPS TAKEN TO IMPROVE TEACHING & EXAMINATION

The department has been running for the past five years, a teaching course - M.Tech. in Physical Engineering, a course of 2 years duration for M.Sc.'s and B.E.'s. The course has a strong bias towards materials science and instrumentation and aims at creating Engineer-Scientists oriented towards R & D programmes of an applied nature.

contd...p.20.

interdisciplinary projects and a curriculum based on the Unit System have been developed for this course, which has an intake of 10-12 students per year.

The department appears to have experienced some difficulties in carrying out the various research activities due to non-availability of funds and foreign exchange and non availability of fabrication and maintenance facilities (special materials and minor special components and accessories).

During the period 1965-73, the department has contributed to about 348 research publications in various scientific journals in India and abroad.

Under the Fourth Five Year Plan, the following allocation under Block and Plan had been approved for research:

Recurring

Posts approved & filled up -- 1 Professor, 2 Assistant Professor/ Readers

Non-Recurring

Year	Block Rs	Plan Rs	Total Rs
1966-67	47,926	-	47,926
1967-68	45,010	-	45,010
1968-69	85,107	3,023	88,130
1969-70	75,910	2,288	78,208
1970-71	1,19,755	2,952	1,22,707
1971-72	91,800	5,035	96,835
1972-73	1,01,743	5,054	1,06,797
1973-74	97,457	5,993	1,03,450
	6,64,718	24,345	6,89,063

Fifth Plan development programmes of the department

The department's plan for research development under the Fifth Plan cover such areas as ion bombardment of solids, secondary electron emission, range measurements of implanted ions and surface properties of ion implemented materials and diffusion in metals, alloys etc. by the group on mass spectroscopy.

contd...p.21.

The group on magnetic resonance plans to add pulsed NMR, ENDOR, Dynamic nuclear polarisation and magnetic relaxation to the existing facilities of NMR, ESR and NQR and the future programme would cover newer areas like, biomolecules, and liquids besides the existing ones.

The group on X-ray crystallography proposes to work mainly on biomolecules and on high temperature crystallography.

The group on critical point phenomena will be engaged in the study of thermal division including phase transitions.

The group on dielectrics and ferroelectrics would study ferroelectric phase transitions, domain structure, electric and piezoelectric crystals.

The group on Lasers would fabricate He-Cd and Argon lasers and study phenomenoa like Brillouin scattering, Raman scattering and electro-optics effects in non-linear crystals.

The group on semiconductors would be engaged in the study of transport properties, recombination phenomena with special reference to deep level impurities and pressure effects.

The group on theoretical physics would concentrate on fundamental problems like electron transport and localisation in disordered systems, electron transport and exciton tunnelling phenomena and interactions involving exitations in solids.

The department will also participate in other inter-disciplinary areas like earth sciences, molecular biology, co-ordinated mechanics, solid state electronics and molecular structure etc., The department would continue to take active interest in teaching courses for M.Tech., B.E., M.E. and Ph.D. students.

The department wishes to reiterate its proposal for the establishment of an Advanced Centre for Solid State Physics in view of its study in depth of the structure - properties of solid state materials with a view to elucidation of structure - property relationships. This would help the department to achieve its objective in the preparation of suitable materials, components and instrumentation relevant to national needs.

contd...p.22.

DEPARTMENT OF APPLIED MATHEMATICS

The Department has a total staff strength of 16 (3 Professors, 6 Assistant Professors, 6 Lecturers and 1 Other) and has 15 research scholars on the rolls as on 1.4.1974. The major areas of research in the department consist of : (a) Computer and Management Science (b) Elasticity (c) Fluid Mechanics and non-linear Waves (d) Mathematical Physics (e) Operator Theory (f) Plasma Physics (g) Probability Theory (h) Pure Mathematics. Three Professors of the department have specialisation in Computer and Management Sciences, Mathematical Physics and Probability Theory. Some of the teachers of the department have worked in institutions within the country and abroad under various assignments of teaching/research in the areas of Computer Science, Probability Theory, Solid State Physics, Fluid Mechanics, Plasma Physics, Non-Linear Waves, Elasticity etc. at such institutes as Indian Statistical Institute, Calcutta, University of Chicago, Weizmann Institute of Science, Israel, Standford University, Universityof Wisconsin, National Chemical Laboratory, Poona, Bell Laboratories, New Jersey, Technical University, Budapest, University College Cardiff, U.K., Harward University, USA, University of Toronto, Canada, Cornell University, USA, University of Leeds, UK, University of Freiberg, West Germany, IIT Kanpur, Delhi, etc. Besides guiding research scholars towards Ph.D., the department has undertaken research schemes on Blast Waves and under water explosion and Transonic Flow, financed by the Ministry of Defence to the extent of Rs.21,920/-

The department subscribes to about 100 journals and the departmental library contains about 900 books. The department has been using earlier the computational facilities at the National Aeronautical Laboratory, Hindustan Aircraft Ltd., TIFR, Bombay, before the installation of IMB 360-44 computer at the Institute. Many short-term workers have been using the facilities available in the department both in the library as well as consultation with the faculty members.

The department has introduced level courses in various areas in Mathematics and its applications to prepare the students for their Ph.D. programme. The department of Applied Mathematics have been experiencing some difficulties for lack of secretarial facilities and foreign exchange for publication and reprints. Between the years 1968-73, the department has contributed to about 135 papers for publication in scientific journals in India and abroad covering various aspects of areas of specialisation.

contd...p.23.

Under the Fourth Five Year Plan, provision for the recurring and non-recurring grants had been made, as given below:

Recurring:

	No. of Posts	
	Posts sanctioned	Posts filled up
Asst. Profs.	4	3
Lecturers	3	2

Non-Recurring

Year	Block	Plan	Total
	Rs.	Rs.	Rs.
1966-67	15,066	-	15,066
1967-68	5,258	-	5,258
1968-69	5,258	-	6,949
1969-70	14,253	227	14,480
1970-71	10,211	-	10,211
1971-72	15,302	2,044	17,347
1972-73	14,149	733	14,882
1973-74	17,108	992	18,100
Total:	98,297	3,996	1,02,293

PROGRAMME PROPOSED BY THE DEPARTMENT FOR DEVELOPMENT UNDER FIFTH PLAN

The interest of the department covers areas like Computer Science, Mathematical Physics, Probability Theory, Biomechanics, Non-linear Waves and Partial differential Equations and Transonic Flow. The department is planning to establish a Centre for applications in mathematics in collaboration with the TIFR, Bombay, and for that purpose the following additional personnel would be needed:

Professors	....	2 (Fluid Mechanics, Plasma Physics)
Assistant Professors	....	2 (Numerical Analysis, Fluid Mechanics, Elasticity.)
Lecturers	....	3 (Pure Mathematics, Computer Science)

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The department is keen to participate under the various Faculty Improvement Programmes of the University Grants Commission providing facilities for external registration for Ph.D. in respect of teachers from colleges.

The department's programme includes setting up of a Space Physics Group to attract more research workers in Plasma Physics. For this purpose, foreign exchange for journals and also funds for visiting professorship would be needed.

Centre for Theoretical Studies

The major areas of research at the Centre covers Physical Sciences, Life Science, Geophysical Fluid Dynamics. The staffing of the different areas are as below:

a) Physical Sciences

Director	Professor T.C.G. Sudarshan
Professors	Professor K.P. Sinha
	Professor A.R. Rajagopal
	Professor N. Mukunda

b) Life Science

Associate Professor	Dr. B.R. Seshachar
Visiting Professor	Professor H. Sharathchandra
Assistant Professor	Dr. M.D. Gadgil

c) c) Geophysical Fluid Dynamics

Professor	Professor R. Narasimha
Assistant Professor	D.S. Gadgil

Some members of the staff of the Centre have worked in institutions within the country and abroad on teaching/ research assignments in areas like Elementary Particles Physics, Condensed Matter Physics, Many Body Problems, Human Chromosomes, Applied Mathematics, Problems in Tropical Metereology etc. at the University of Taxas, Austin, USA, Bell Telephone Laboratory, USA, University of California, Princeton & Syracuse Universities, Harward University, University of Brussels, Massachessts Institute of Technology, Poona University, TIFR Bombay etc.

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contd...p.25.

Besides guiding research of scholars in the areas of specialisation at the Centre, the Centre has undertaken research projects on Wildlife Ecology (financed by World Wildlife Fund) and Human Chromosome anomalies (financed by World Health Organization).

The Centre has been depending entirely on the main library facilities of the Institute for books journals. The Centre has no Workshop/ nor any instrumentation/ glass bloding facilities or major research equipment, and does not have any plan to acquire any of these. The Centre has been running on extremely active Visitor's programme. During May-July 1973, a Summer Visitor's programme was arranged and about half a dozen of young research workers from various universities worked at the Centre for period of 3-6 weeks. About 11 research workers had spent substantial periods in residence upto the end of March 1973. Besides these long-term visits, the Centre received 9 other distinguished scientists from other institutions in India and abroad on short-term basis. The Visitor's programme covers assignment not only at the centre but visits to other sister departments like the Department of Physics, Aeronautical Engineering Microbiology and Pharmacology. The Centre has got facilities of Computer, Microscopy and Biochemical facilities in the Microbiology and Pharmacology laboratories of the Institute and in the Department of Biochemistry. Fluid Dynamics Laboratory facilities are utilised from the Department of Aeronautical Engineering.

Since its inception in July 1972, the Centre has been organizing seminars of high academic quality in various fields such in Unsolved Problems in Physics(1972), Science and Society (1973), Theoretical Physics, Statistical Physics, The Mind: Pathways to its Understanding (1974). The Centre also organised a seminar on Mammalian Ecology in December 1974 and had a programme of organizing a two-week workshop on Geophysical Fluid Dynamics (1974-75). All these seminars/workshops attracted distinguished physicists and other specialists from India and abroad. The Centre does not have any student but the members of the staff actively participate in the teaching in other sister departments such as Physics, Microbiology and Pharmacology.

The Centre has been experiencing difficulties in carrying out research activities for lack of timely intimation of funds and lack of standard journals and books.

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Under the Fourth Five Year Plan, the following Recurring (teaching staff) and non-recurring had been approved:

Recurring

No. of posts approved and filled up ... 4 Professors, 2 Assistant Professor

Year	Block Rs.	Plan Rs.	Total Rs.
1972-73	6,657	-	6,657
1973-74	16,612	-	16,612
Total:	23,269	-	23,269

PROPOSED PROGRAMMES FOR DEVELOPMENT UNDER V PLAN

The major components of the Centre's activities include: research work by its core staff, the year-round Visitor's programme (short-term courses) and organization of seminars on subject of fundamental nature. Besides the major research interest of the staff (Physical Science, Life Science and Geophysical Fluid Dynamics), the Centre proposes to work on problems of interdisciplinary nature, helping to bring together the expertise and attitude of workers in diverse fields such as Physics and Biology and pave the way for the articulation and solution of problems which either workers individually would not be able to tackle. The working together in one centre with people of different backgrounds would foster unity of theoretical problems at fundamental level.

The Centre's Visitor's programmes provides an opportunity as "recharing station" for people in universities and other institutions to take a break from their normal routine and to work uninterruptedly on research problems with workers in fields other than their own, even though for a short while. All these activities centre round the sharing of facilities and expertise available in sister departments at the Institute. Between 1972-74, the Centre has contributed to 21 research publications in various scientific journals in India and abroad.

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CENTRAL INSTRUMENTS AND SERVICES LABORATORY

The activities connected with the instrument technology is very limited in the universities and research institutions with the result that fully qualified scientific personnel are not readily available. In order to over come this difficulty the Indian Institute of Science, Bangalore, set-up a Department of Central Instruments and Services Laboratory, where scientific workers in various branches of science, namely, physics, Electronics, M.E., Chemistry could be trained in the Instrumentation relevant to their respective nature of work. The programme at the Centre is hardware oriented.

The staff position as on 1.4.1974 at the CISL consisted of 2 Professors, 2 Assistant Professors, 8 Lecturers and 12 Others. The major areas of research provided at the Services Laboratory are:

a) Analytical Research Services of the following Instruments :

i) Carl Zeiss Jena N.R.-10 Spectrophotometer

ii) Unican SP-700 UV visible near infrared Spectro-photometer

iii) AEI MS-702 Mass Spectrometer for Solids, Liquids and Gasses

iv) J-20 Spectropolarimeter

v) IBM 360/44 Computer

vi) AEI MS 7/MS 10 Mass Spectrometers

vii) Mass Bauer Spectrometer, ECIL -GRS-20B

viii) ECIL Gas Glow Counter, Geiger Counting System GCS 10A

ix) Edwards 19" Vacuum Coating Plant

x) Tektronix Oscilloscope 549

b) Repairing and Servicing of Instruments/Equipment:

i) Electronic Instruments

ii) Electromechanical equipment

iii) Optical Instruments

iv) Vacuum Instruments/Equipment

c) Research and Development - Instrumentation:

Thin Films, Lasers, Vacuum Systems, Applied Optics, Holography.

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Electronics - Measuring instruments, analog and digital electronics

Photoelectric Sensors and Devices, Mass Spectrometer

Some of the members of the staff at the Centre have had the benefit of working in various institutions within the country and abroad under some specific research projects pertaining to Instrumentation and Servicing such as at NPL, Teddington, England, State University of New York, University of Western Ontario, Canada, Stevens Institute of Technology, New Jersey, CSIRO Division of Physics, Australia, University of Bristol, Universities in West Germany and IIT Delhi on specific programmes like Design & Fabrication of optomechanical instruments, electron microscopic studies, computer science, applied optics, etc.

Ten scholars have been working at the CISL on various problems pertaining to Instrumentation and Servicing with fellowship awards.

The Centre runs a workshop pertaining to Drilling, Engraving, Grinding, Milling, Welding etc. with a staff strength of 10 mechanics including project staff. The Centre possesses a departmental library with 345 books. Journals etc. and other books pertaining to Instrumentation and Servicing are available from the main central library and other departmental libraries of the Institute.

The Central Glass blowing service caters the needs of the entire Institute with a staff of 4 glass blowers and equipment comprising of glass blowers, lathe and oven. The glass blowing section has developed expertise in special jobs like double surface condensers, Dewar Flasks, distillation apparatus, reaction vessels, colorimeters, rotary flow meters, sintered glass filters, ground glass joints, stopcocks, high vacuum seals, glass to metal seals etc. The facilities of the laboratory have been extensively used by Government, Research and Industrial organisation all over the country. Nearly 120 institutions have taken advantage of the facilities created at the Central Instruments and Services Laboratory.

Vacuum Section : The facilities available in the Vacuum Section of the Centre for servicing and reparing of vacuum pumps, Pirani and Penning Gauge calibrations, various types of optical coatings in Vacuum and Laser mirrors have been utilised by a large number of organi-

contd...p.29.

sation such as the IITs, Instrument Research and Development Establishment, Dehra Dun, Solid State Physics Laboratory, Delhi, Cochin University, Osmania University, Banaras Hindu University, Gauhati University, University of Agricultural Sciences, Bangalore, Madurai University, Institute of Armament Technology, Poona, BARC, Bombay, Electronics Corporation, Hyderabad, Survey of India, National Aeronautical Laboratory, Bangalore, Indian Space Research Organisation, Bengalore etc.

Research Services : The Research Services provided facilities for analysing more than 1000 samples, utilising the Infra-Red and Ultra Violet Spectrophotometer, Mass Spectrometers and Varian T-60 NMR Spectrometer for a large number of organisations in the country such as Central College, Bangalore, Christian Medical College, Vellore, Central Food Technological Research Institute, Mysore, Universities of Mysore, Meerut, Poona, Andhra, Rajasthan, Karnatak, Nagpur, Panjab, Vikram, Madras, BITS, Pilani and Geologidal Survey of India, National Aeronatutical Laboratory, Bangalore, IITs, BARC, Bombay, Bharat Electronics Ltd., Bangalore, Bengal Lamp Works, Bangalore, Raman Research Institute, Bangalore etc.

Electronic Section : The Electronic Section assisted various organisations in the fabrication, design and development of a large number of electronic instruments by such users as Indian National Scientific Documentation Centre, Bangalore, Central Power Research Institute, Bangalore, Technolab Instruments Co., Bangalore, Central Water & Power Commission, Bangalore, Osmania University, Bangalore University, Forest Research Laboratory, Bangalore, Department of Mines & Geology, Bangalore, Central Food Technological Research Institute, Mysore, Defence Food Research Laboratory, Mysore etc.

Optical Section : The Optical Section of the Laboratory provides workshop facilities with precision optical measuring equipment, design and fabrication of prisms, laser mirrors, Brewster Windows, Fused quarts flats, Ferrite core discs etc. by such users as Hindustan Photo Films Ltd., Coty, Solid State Physics Laboratory, Delhi, IITs, Indian Association for the Cultivation of Science, Calcutta, NAL, Delhi, Indian Telephone Industries, Bangalore, Space Application Centre, Ahmedabad and Universities.

Computer Centre : The computer centre has provided training and hardware facilities to such user organisations as Hindustan Aeronautics Limited, National

contd...p.30.

Aeronautical Laboratory, Space Science & Technology Centre, Central Power Research Institute, IITs, Indian Telephone Industries, universities, Bharat Electronics, Raman Research Institute, Batonics Corporation, State Electricity Boards, Geological Survey of India etc.

The Centre has provided effective support in the training of various aspects of instrumentation, fabrication, repair and servicing facilities to a large number of institutions/organisations and the centre's contribution in the repair and maintenance of imported sophisticated equipment compares well with the Central Scientific Instrumentation Organisation of the CSIR located at Chandigarh and the servicing facilities offered by the centre are being increasingly appreciated by the teaching/research institutions of the country.

The Centre has taken up 26 research projects as financed by UGC (13 schemes), Ministry of Defence (6 schemes), CSIR (1 scheme), Hindustan High Vacuum Company, Hindustan Aeronautics, Toshniwal Bros (6 schemes) with provision of funds totalling Rs.11,33,950 during the period 1967 to 1974. All these schemes pertain to R&D programmes.

Under the Fourth Five Year Plan, the Commission approved of the creation of a post of Professor at the Centre which has been filled up. The allocation of funds for research at the CISL for the period 1966-67 to 1973-74 is as below:

Year	Block Rs.	Plan Rs.	Total Rs.
1966-67	37,729	-	37,729
1967-68	73,659	-	73,659
1968-69	78,660	3,918	82,578
1969-70	39,081	2,578	41,659
1970-71	66,019	9,961	75,980
1971-72	54,337	29,929	84,266
1972-73	49,927	18,675	68,602
1973-74	62,278	19,722	82,000
Total:	4,61,690	84,783	5,46,473

Special mention may be made of the equipment and gadgets fabricated by the Centre, such as, Helium-Neon Laser, Modulated Beam Photometer, Diffusion Pumps (all in its Vaccum Laboratory); Angstrometer, Twyman-Green

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Interferometer, Ellipsometer, Reflectometers, Overhead Projector, Frequency Lens all under its Optics Laboratory; Lenses, Photomultiplier A.F., Nano-ammeter, Power Supply, Interval Timer, Digital Clock, Digital Thermometer, Logic Tester, all under its Electronics laboratory.

The Centre organised short-term courses and symposium in Electron Microscopy, Instrument Design, High Vacuum Technology, Lasers, Solid Thin Films, Fortran IV programming and Computer Oriented Numerical Techniques, Algorithm Techniques and Programmes etc. during the period 1966-73.

Besides its normal activities in Instrumentation, the Centre contributed to 114 research publications in various scientific journals in India and abroad during the period 1966-73.

PROPOSED PROGRAMMES FOR DEVELOPMENT UNDER V PLAN

Emphasis has been laid on fabrication, clibration and standardisation with regard to Optics Technology, Vacuum, Thin Films and Lasers in the Fifth Five Year Plan for which adequate provision for equipment would be needed. This would ensure enhanced capability for design, fabrication and servicing of electronic equipment and creation of an electronic design office and acquisition of necessary equipment along with the creation of mechanical design office and workshop with adequate provision of sophisticated research equipment.

It may be mentioned that the CIGL has been identified by the Commission for developing a link with a sister university in UK under Indo-British University Collaboration programme to pursue well defined and mutually acceptable collaborative programmes in Instrumentation. It is likely that some sophisticated items of equipment essential in pursuit of the agreed research project, may be provided by the Overseas Development Administration , UK.

All these programmes, the Centre feels, would be possible by strengthening the senior scientific and supporting staff at the CIGL. The staff position as on 31.3.1974 consisted of 2 Professors, 2 Assistant Professors, 8 Lecturers and 12 Others.

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DEPARTMENT OF FOREIGN LANGUAGES

The staff in the Department of Foreign Languages as on 31.3.1974 consisted of 1 Professor, 2 Assistant Professors, 5 Lecturers and 2 Others. The major areas of activity of the Department are:

a) The use of English in science and engineering

b) Problems and principles of designing suitable teaching materials and standardizing proficiency tests for B.E., M.E., and Ph.D. students.

c) Psycholinguistics

d) Statistical stylistics

e) Contrastive study of languages from the point of view of scientific and technical translation.

Three research scholars have been working in the department, out of which two are on UGC Junior Fellowships. A number of staff members of the department have worked in institutions within the country and abroad on research assignments at School of English, University of Leeds, Department of Applied Linguistics, University of Edinburgh, University of Reading. The department possesses 1400 books and audio visual aids in its workshop. The research workers (including staff) in the department have made frequent use of the facilities available in different institutions in the country, such as, American Research Centre, Hyderabad, the British Council Library, Bangalore, Bangalore University Library, the library of the Central Institute of English and Foreign Languages, Hyderabad, and technical assistance available in INSDOC has been utilised by the department. Ph.D. workers registered in other universities have made use of the facilities available at the Department of Foreign Languages, Indian Institute of Science, Bangalore, alongwith other facilities in pursuit of their specific research projects. The department organised seminars on Technical Translations and Technical Communication. The department has taken the following steps for the improvement of the teaching of English at the Institute:

i) At the beginning of the term, the department gives a diagnostic test to each student registered for the course, so that when teaching the department can have their actual needs in view.

ii) Students are given a large number of home and

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class assignments and discuss these assignments. This is done to ensure that every student gets individual attention.

The department has been provided with a non-recurring grant of Rs.5,000/- for research. Besides this, the department has been provided with a Block Grant of Rs.35,870/- during the period 1966-67 to 1973-74.

Inspite of inadequacy in funds, the department has made 8 publications in scientific journals upto to 1974.

PROPOSED PLAN FOR DEVELOPMENT UNDER THE FIFTH PLAN

The plan for development under the Fifth Plan covers the following programmes:

i) To prepare an inventory of the linguistic features characteristic to scientific writings. The inventory will be based on a frequency count of the syntactic, lexical and semantic features of books and research papers.

ii) To write suitable textbooks for the teaching of scientific English to students of science and engineering. The books intended to be written by the department will have needs of the Indian students in view.

iii) To study whether language used by a person can be taken to be a significant clue to his personality.

iv) To study how the human mind organises language difficulty in different situations.

v) To study the extent to which different languages (concerned with technical translations) differ from one another.

To achieve that objective, the department has asked for the provision of 2 Senior Research Fellows, 3 Research Assistants, Electronic Desk Calculator and recurring grant of Rs.5,000/- per annum for computation etc.

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II. DIVISION OF CHEMICAL AND BIOLOGICAL SCIENCES

The Division covers the Departments of (1)Biochemistry, (2)Inorganic Chemistry and Physical Chemistry,(3)Microbiology and Pharmacology, (4)Molecular Biophysics Unit and (5)Organic Chemistry. The Division has been provided with Central Animal Facilities. The staff position as on 1.4.1974 in the various departments of this Division is as below:

Department	Staff in Position as on 1.4.1974				
	Prof.	Asstt Prof.	Lect.	Tech. Asstt.	Non Tech. Staff
Biochemistry	1	3	-	-	-
Inorganic Chemistry & Physical Chemistry	1	2	2	4	2
Microbiology and Pharmacology	-	1	2	1	-
Molecular Biophysics Unit	-	-	-	-	1
Organic Chemistry	1	2	-	3	5
Central Animal Facility	-	-	-	1	5

The Department of Inorganic and Physical Chemistry has been recognised by the UGC as a Centre for Special Assistance for intensification of some of its activities in Inorganic and mineral chemistry, Electro chemistry, Molecular structure, Polymer chemistry and High energy solids and a few other areas

The Department of Biochemistry has been functioning as a Centre of Advanced Study in Biochemistry. Eighteen groups have been identified in the Division on the basis of areas of specialisation and 37 schemes are being implemented with financial support from different agencies. In addition to research and development programmes, the academic staff in the Division are also actively engaged in the training and teaching programmes in the Institute.

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SIRY The major areas of research in the department cover (1)Proteins and Enzymology, (2)Lipids, (3)Plant Biochemistry and Cellular Biology, (4)Endocrinology and (5)Nucleic Acids and Molecular Biology with one or two Professors and Assistant Professors incharge of each connected with their respective fields of specialization. Eleven scholars have been working in the department in various areas with senior fellowships and

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74 junior research fellows have been enrolled for research in various areas in the Department of Biochemistry. The Professors and other academic staff members of the department have been associated as visiting fellows in institutions in India and abroad in pursuit of research such as, Absorption of lipids, Plant Neurotoxins, Metabolism of vitamin A, Reproductive Physiology, Gonodotropin, Immunochemistry, Enzyme Reaction, Hormones and cellular metabolism, Metholdology of nucleic acid etc. at institutions like Birmingham University, National University of Canberra, Columbia University, MIT, USA, Medical Research Centre, University of Okhlohoma, USA, Albert Einstein College of Medicine, USA, Yale University, St. Mary's Hospital Medical School, London, Harward Medical School, Boston, Weizmann Institute of Research, Israel, University of Nagoya, Japan, All India Institute of Medical Sciences, New Delhi, University of Sheffield, U.K. MRC Laboratory of Molecular Biology, Cambridge, etc.

The department does not possess a sub-library. The research workers and staff use the main library which has a collection of over 1,75,000 volumes of books, periodicals and reports. The library serves the needs of the staff and students of the Institute. Over 1900 current periodicals are being subscribed. The department has its own a small workshop with mechanics, carpenter, besides the facilities available in the mechanical engineering workshop of the Institute. The department uses the facility available at the CISL of the Institute. Some of the major equipment available with the department includes Mass Electrophoresis apparatus, Warburg Thermostatic Water Bath, Refrigerated Centrifuge Type K 60/s, DU Spectrophotometer, Fraction Collector, Super Speed Centrifuge, KM Oxygraph, Automatic Amino Analyser, 10 VAC 60 Ultracentrifuge, Beckman 'F' Model Analytical Ultracentrifuge, Hilger Watt Microptic Polarimeter, Decompression Chamber, Beckmand Liquid Scintillation Counter, Perkin Elmer Gas Liquid Chromatography equipment etc. Use of these equipment has been made in pursuit of various research activities of the department. The equipment possessed by the department have been valued at Rs.30 lakhs, the servicing, spares and maintenance of which count for about Rs.2 lakhs per annum.

The staff of the department have been utilising facilities available in other institutions on short visits at institutions like, TIFR Bombay, Neurochemistry Laboratory, Christian Medical College & Hospital , Vellore etc. The facilities available at the department are being used by other institutions such as the Universities of Karnatak, Madras, Poona, Bangalore, Sri Venkateswara,

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All India Institute of Medical Sciences, New Delhi, VP Chest Institute, Delhi, Dental College, Bangalore, National Dairy Research Institute, Bangalore, Home Science College, Bombay, Cancer Research Institute, Bombay, Tata Memorial Centre, Bombay, etc. Some of the major equipment acquired by the department are:

1. Nuclear Magnetic Resonance Spectrometer
2. Infra-red Spectroscopy
3. Mass Spectroscopy
4. Computer
5. Optical Rotatory Dispersion

The Department has fabricated equipment for use by its research scholars and others in pursuit of specific research projects:

1. Stabilized power supply units with cooling plate for Electrophoresis.
2. Automatic Fraction Collector.
3. Magnetic Stirrer with speed control.
4. Vortex Mixer.
5. Thin layer chromatographic equipment.
6. Metering pumps.

The department has been organising seminars/ summer schools/colloquia in various aspects of Current Trends in Biochemical teaching and research during the period 1969-70 to 1973-74 with participants from all over the country.

Once in every three months, a symposium is held under the auspices of the Biochemical Society, where four Ph.D. students present their work for open discussion. Students on completion of their Ph.D. work are required to present their results of study at a colloquia before submitting their theses. Lectures are arranged by the staff members of the department in the beginning of the year for the benefit of scholars registered for their Ph.D. These lectures are intended to familiarise the research scholars in subjects like Organic Chemistry, Physical Chemistry, Mathematics and Biology to overcome deficiencies in them for which the scholars earn credits. Periodic tests and quizzes

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are arranged after series of lectures with the provision of periodic tutorials. Regular terminal and final examinations are arranged and the students are required to obtain a minimum Grade Point Average of 2.5.

Between the period 1965-73, the department contributed to about 305 publications in scientific journals in the country and abroad. Between the period 1965-66 to 1973-74, the department undertook specific research schemes with funds provided by agencies like ICMR, CSIR, DAE, Defence, PL 480, Ford Foundation, NIH, INSA, the number of such schemes during 1973-74 being 14, with funds ranging from 3,400 to Rs.1,13,706 for a project. Some of the major areas of research project, cover, Chemical Biochemical and Nutritional Studies on Vitamin A and Carotenoids, Gene Expression and Control in Bacterophage infection, Lipid Metabolism in Developing Brain, Physiology and Biochemistry of Reproduction, Plant Viruses etc.

Under the Fourth Five Year Plan, the Commission sanctioned 1 Professor and 3 Assistant Professors all of which have been filled up. The allocation of funds under Plan and Non Plan for the period 1966-67 to 1973-74 for research is indicated below:

Year	Block	Plan	Total
1966-67	52,157	-	52,157
1967-68	53,947	-	53,947
1968-69	62,428	4,779	67,207
1969-70	62,689	4,682	67,371
1970-71	85,709	5,147	90,856
1971-72	69,050	7,084	76,134
1972-73	73,906	5,726	79,632
1973-74	74,507	6,493	81,000

The Commission also provided a non recurring grant of Rs.3.50 lakhs- Rs.1.00 lakh for building and Rs.2.5 lakhs for equipment under the Fourth Plan.

The department has been experiencing some difficulties in carrying out its research activities due to non-availability of funds of technical assistance for fabrication and maintenance, non-availability of foreign exchange, non-availability of reliable Indian equipment.

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DEPARTMENT OF INORGANIC & PHYSICAL CHEMISTRY

The Department made significant contribution in the fields of co-ordination chemistry, electro-chemistry, polarography, sulphur chemistry, molecular and crystal structure determination, surface chemistry, catalysis, high polymers and mineral beneficiation during the Fourth Five Year Plan. A beginning has been made in modern Geo-chemistry, Crystal growth, quantum chemistry and High energy solids. Research and development work in the department has led to the establishment of an industrial unit for the manufacture of silicon based materials such as silicon tetra chloride, ethylsilicate etc. A binational project on phosphazenes has been undertaken in collaboration with Birkbeck College, London. The department has been recognised as a centre for special assistance by the University Grants Commission.

The staff in position as on 31.3.1974 consisted of 6 Professors, 5 Assistant Professors, 5 Lecturers and 6 others.

The major areas of research in the department pertain to the following:

1. Electrochemistry
2. Molecular Structure
3. Polymer Chemistry
4. High Energy Solids
5. Inorganic and Mineral Chemistry

Each of these areas has been providing facilities for research under the supervision of specialists in the respective areas. A number of faculty members have been associated with teaching and research in other institutio in the country and abroad, such as, Birkbeck College, University of London(Chemistry of Phosphazenes); Royal Institute of Technology, Stockholm(Co-ordination compound of sulphur & selinium donor ligands); Department of Chemistry, University of Pennsylvania, USA(Electro-chemistry), Department of Chemistry, The Israel Institute of Technology, Haifa and the Weizmann Institute, Rehvoth and Tel Aviv(Electro-chemistry); California Institute of Technology Pasadena, California(Nucleic acid); Explosives and Propellent Laboratory Picatiny Arsenal Dover, New Jersey, U.S.A.(Explosives and Propellent); Research Institute for Advanced Studies, Baltimore, Maryland, U.S.A (Solid state chemistry of high energy solids); Mathematical Institute, Oxford(Quantum Chemistry); Loyola University, Chicago, USA(Theory of Excimers); Wayne State University, Michigan, USA(Chemical bonding); University of Sussex, U.K.(N.M.R., mass spectral and photoelectron

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spectroscopic studies on boron-nitrogen compounds); Federal Institute of Technology, Zurich, Switzerland (X-ray crystallography of transition metal complexes); Phillips Research Laboratory, West Germany(Crystal growth); Institute of Organic and Biochemistry, Czechoslovac Academy of Sciences, Prague(Physico-chemical study of nucleic acid) etc.

The department has undertaken a number of research schemes financed by different agencies such as, CSIR, BEL, Bangalore, Defence, Atomic Energy, etc. with provision of funds for each scheme ranging between Rs.6,854 to Rs.3,42,000(for a period of three years). Thirty-five scholars have been working for their Ph.D. with fellowship from agencies like CSIR, UGC, NCERT, I.I.Sc. Bangalore with scholarships ranging between Rs.250/-to Rs.400/-p.m. Besides this, 8 non staff members have been working in the Department as Pool Officer (1), Research Associate (2)and Senior Fellows(5).

The Departmental library possesses 686 number of books and the workshop provides facilities of Latho, Drilling and Shearing with a number of mechanics attached to each. The department also possesses one glass blower. The department has utilised the facilities available in other Institutes in pursuit of their research, such as, BARC Bombay, Central Drug Research Institute, Lucknow, M.S. University of Baroda, Ciba Research Centre, Bombay, IIT Madras, Govt. Porcelain Factory, Bangalore, Vikram Sarabhai Space Centre, Thumba etc.

The major equipment in the department consists of (i)NMR Spectrometer, (ii)Spectrophotometers covering the range from Infrared to Ultraviolet, (iii)Mass Spectrometer, (iv)Radiochemical measurements,(v)Ultracentrifuge, (vi)Optical-rotatory dispersion apparatus, (vii)Electron spin resonance unit. Research workers from other institutions in India have utilised the facilities available in the department during the last few years, such as, Universities of Karnataka, Kerala, Saugar, Rajasthan, Bangalore, MS University of Baroda etc. for purposes of Physico-chemical studies on metal complexes, Hydro-thermal synthesis, x-ray and i.r. electronic spectral measurements, Chemical analyses of rocks and minerals, Polarography etc.

The department has to its credit fabrication of equipment such as, Electron diffraction camera, Weissenberg moving film camera, Capillary electrometer, Dielectric constant apparatus, Magnetic susceptibility balance, Thermogravimetry and differential thermal analysis, Ultrasonic velocity determination, Polarographs,

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etc. During the period 1967-73, the department organises short-term courses, in Coordination Chemistry, Interpretation of Infrared Spectra and Chemical Spectroscopy. Upto 1973-74 students admitted to the Department of Inorganic and Physical Chemistry were offered advanced courses in Physical and Inorganic Chemistry. At present students are given choice to take up courses of their interest anywhere in the Institute. Satisfactory performance in all these courses is a pre-requisite for the Ph.D. degree of the Institute.

During the period 1965-74, the department has contributed to 325 research publications, monographs and books in scientific journals in India and abroad.

During the Fourth Plan, the Commission approved of the creation of posts of 1 Professor, 2 Assistant Professors, 2 Lecturers and 4 Others all of which have since been filled up. The allocation of funds for research in the department during 1966-67 to 1973-74 under Block and Plan provision is as below:

Year	Block	Plan	Total
1966-67	56,023	-	56,023
1967-68	56,749	-	56,749
1968-69	64,456	2,995	67,451
1969-70	62,283	3,000	65,283
1970-71	66,650	2,424	69,074
1971-72	48,274	5,538	53,812
1972-73	69,164	2,843	72,007
1973-74	72,724	4,976	77,700

Non-availability of foreign exchange, technical assistance for fabrication and maintenance, lack of workshop, lack of funds etc. have been some of the difficulties which the department has been experiencing in the implementation of its various programmes.

Proposed programme of development during the Fifth Plan

The department has identified five groups, e.g.(1) Electro-chemistry, (2) Molecular Structures, (3) High Energy Solids, (4) Polymers and (5) Inorganic and Mineral Chemistry, as areas for development under the Fifth Plan based on the recommendations of the Reviewing Committees. The following major areas have also been taken up for development during the Fifth Plan period:

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(a) Energy conversion, (b) Electrochemical and other instrumental methods, (c) Theoretical chemistry, (d) Solid propellants, (e) Polymeric stabilization, (f) Fluorine Chemistry and Bio-inorganic Chemistry.

The following projects have been proposed to be either terminated or tappered off gradually- Electrodeposition, Technical gas reactions and catalysis, Sulphur chemistry and Mineral beneficiation.

The departmental programme also envisages project activities like Ion selective electrodes, Explosive sensitising, Space polymers and Phosphazene chemistry. The department has also identified inter-disciplinary areas for collaboration with other departments/groups in the Institute such as, Metallurgy, Molecular structure group, Aeronautics and Metallurgy, Molecular Biology group, Civil and hydraulic engineering, Earth science group and Materials science group in areas like Fused electrolytes, Structure of molecules, Solid propellants, Biopolymers systems, Concrete polymers, Geochemistry, Crystal growth. All these programmes have been proposed to be helped by floating staff in addition to the available staff members which have to be strengthened by creating new faculty positions.

The areas identified for research during the Fifth Plan period include, Electrochemistry (covering energy conversion and electro synthesis); Molecular structures (both theoretical and experimental); Solid state chemistry of high energy; High Polymers, Inorganic and Mineral Chemistry.

To achieve the objectives of teaching and research, the department has proposed for the provision of the following Recurring and Non-Recurring facilities:

Non-Recurring	Building	Equipment	Books & Journals
	(Figures in lakhs of rupees)		
	2.50	5.00	1.00

Recurring 60,000 p.a. (1 Professor, 2 Readers, 3 Senior Research Fellows and 4 Junior Research Fellows)

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DEPARTMENT OF MICROBIOLOGY &

The staff of the department consists of 2 Professors, 1 Assistant Professor, 3 Lecturers and 3 Technical Assistants/Research Assistants. The major areas of research in the department pertain to Microbial Metabolism & Genetics.

During the Fourth Plan period, the department has made contributions to Insect and Soil Microbiology- notably in relation to the silk worm, Microbial fermentations, Cancer and Tuberculosis, Pathogenic fungi and the Pharmacology of natural products and synthetic compounds. All this work has been done in close collaboration with the Department of Organic Chemistry. The department has been concentrating on the studies of Genetics and Physiology and bacterial viruses and aspects of molecular biology. The work on classical pharmacology has been phased out. The department is now designated as Microbiology and Cell Biology Laboratory. On the basis of work done two major groups have been established e.g. in Microbial Metabolism and in Genetics.

Sixteen scholars have been working in the Laboratory on specific research projects for their Ph.D. with junior/senior fellowships and scholarships as awarded by the UGC(6); CSIR (5); DAE(2); and I.I.Sc.(8). One of the follows has been working as Pool Officer. Some of the members of the staff of the department have worked in institutions within the country and abroad on specific research programmes such as, Molecular Biology of Bacteria, Nitrogen Fixation etc. at Yale University, University of California, University of Michigan, University Wisconsin and University of Edinburgh during the period 1962-74. The members of the staff of the department have also undertaken research schemes as financed by the Department of Atomic Energy (2); Indian Council of Medical Research(2); Indian National Science Academy (1); Coir Board (1) Naval Research, USA (1) on problems like Protein synthesis, Environmental carcinogens, Nicotinic acid bio-synthesis and regulation of mycobacteria, Human Mycoses, Metabolism in Phenolic compounds, Coconut husk etc. with provision of funds for each varying between Rs.19,081 to Rs.3,61,740.

The departmental library contains about 500 books and the general library possesses over 1,68,000 books and subscribing to a number of journals of science and technology. A small workshop of the department is manned by one mechanic and the services of Central Instruments and Services Laboratory of the Institute are being utilised.

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Major equipments in the laboratory are: ultracentrifuge, liquid scintillation counter; automatically controlled fermenter, built-in incubators, high-speed refrigerated centrifuges, sonic oscillators, fraction collector etc. The Department has been experiencing some difficulty for lack of foreign exchange in obtaining the spares for those major equipment which are not available in India. The other major equipment available in sister departments of the Institute such as, spectrophotometer, Beckman analytical ultracentrifuge, aminoacid analyzer, NMR equipment, IR equipment, Computer etc. are being fully utilised for purposes of studies and research in the two major areas of the laboratory(Microbial Metabolism & Genetics). The Laboratory has to its credit fabrication of such equipment as Ultra-violet water purifier and the CSIR has recommended to the Government of India to withdraw import proposal to manufacture this item under foreign collaboration.

The department has organised seven seminars/summer institutes during the period 1968-74, on Physiology and General of Bacterial Viruses sponsored by UNESCO, ICSO, TIFR, BARC, U.G.C.; Physiology and General Bacterial Viruses, Applied Microbiology, etc. The programmes pertain to teaching, research and examination etc. are thoroughly examined by faculties and the Senate before their implementation.

The department has contributed to 216 research publications/monographs in various scientific journals in India and abroad during the period 1966-74.

Under Fourth Plan, creation of the posts of 1 Asstt.Professor, 2 Lecturers and 1 Research Assistant was approved and the posts have since been filled up during the Plan period. The allocation of funds for research in Microbiology and Pharmacology Laboratory during the period 1966-67 to 1973-74 under Block and Plan provision is as below:

Year	Block Rs	Plan Rs	Total Rs
1966-67	45,735	2,000	47,735
1967-68	48,864	3,000	51,864
1968-69	51,392	1,905	53,297
1969-70	57,004	1,905	58,909
1970-71	66,285	1,500	67,785
1971-72	46,263	2,000	48,263
1972-73	53,220	2,003	55,223
1973-74	52,238	2,162	54,400

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The department is stated to be handicapped for non-availability of adequate funds, foreign exchange for spares etc.

Proposed programme of development under the Fifth Plan

The Department proposes to concentrate on the following major areas during the Fifth Plan:

1. Genetics and molecular biology of bacterial and bacteriophages.

Studies on various aspects of genetic coding and protein synthesis, development of drug resistance would be undertaken as a major thrust with a view to illucidating genetic make up of mycobacterial and the mechanism of development of drug resistance.

2. Biological Nitrogen-Fixation

Studies on fixation of atmospheric nitrogen at different levels of organism of life i.e. in the environment, soil and plant surfaces, cells, cell-free systems and also the several sub-cellular systems have been proposed to be undertaken.

3. Microbial ecology and soil metabolism

The ecology of microorganisms would constitute a major area of investigation. The persistance and degradation of pesticides and detergents in soil, sewage and water, the physiology of pesticidal action and the extent to which the microorganisms can be manipulated to keep the human environment healthy will be studied. The microbial activities, soil phenomena and microbial production of amino acids and proteins will constitute an added interest to the laboratory in Applied Microbiology.

4. Pathogenic microorganisms

A comprehensive study in the areas of aetiology of fungal diseases, their physiology, biochemistry, host-parasite inter-actions, immunology and fungi in allergy has already been taken up, with funds provided by the office of Naval Research, USA.

Studies on the causes, possible cure and prevention of diseases of silkworm have been proposed to be taken up during the Fifth Plan.

5. Cell Biology

Immunology, oncogenesis and biochemistry of cancer,

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cells, behaviour of cells in culture and cell transformation, regulation synthesis of fibroin, differential in silkworm are some of the areas proposed to be undertaken by the department. With provision of adequate funds the department has proposed to develop tissue culture to isolate and study biological and biochemical aspects of a number of animal viruses that cause diseases of animals and man. This may contribute to the understanding of the Anthropology.

The relationship between genetically inherited diseases and the chromosomal abberrations is also proposed to be taken up as an important sociological problem of the country.

6. Applied Microbiology

Conversion of gypsum to sulphur, development of equipment for the senitization of water for drinking and other industrial purposes, bacterial leaching of ores, indigenisation of equipment for use by bacteriologists and teaching aids, microbial production of amino acids, biochemicals etc. would constitute major activities in Applied Microbiology.

The department has been taking care to prevent inbreeding and for free utilization of physical facilities available in sister departments and making available their own resources for use by others.

Research in fundamental and applied aspects of Microbiology in the field of agriculture, medicine and industrial ihstrumentations have been given prominence in the Microbiology and Pharmacology Laboratory of the Institute.

LECULAR
OPHYSICS
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The Unit was established in 1972(with Prof.G.N. Ramachandran as Head) as an inter-disciplinary activity with the Departments of Physics, Organic Chemistry, Applied Mathematics, Computer Centre and Biochemistry. The present staff positions include, 4 Professors, 5 Assistant Professors and 1 Lecturer. The major areas of research in the Unit pertain to :

a) Biopolymer Conformation
i) Theory of protein conformation
ii) Theory of nucleic acid conformation
iii) Theory of polysaccharide conformation
b) Structure of Collagen and connective tissue biochemistry
c) Structure of cyclic peptides, such as antibiotics and membrane peptides.

d) Helix-coil transition of biopolymer in solution
e) Experimental studies on biopolymer conformation

i) Solution studies
ii) Optical rotatory dispersion, and circular dichroism
iii) Nuclear magnetic resonance spectroscopy
f) X-ray crystallographic studies

i) Single crystal studies on peptides, nucleosides, nucleotides and mono-and di-sachharides and antibiotics.

ii) Fibre diffraction studies on synthetic polypeptides analogous to collagen, synthetic polynucleotides analogous to DNA and RNA and synthetic poly-saccharides-strach and cellulose derivatives.

g) Chemical notation system

h) Three-dimensional reconstruction of images. The special areas of research include, Biopolymer Conformation Structure of Collagen and connective tissue biochemistry, Structure of cyclic peptides, such as antibiotics and membrane peptides, Helix-coil transition of biopolymers in solution, Experimental studies on biopolymer conformation, X-ray crystallographic studies, Chemical notation system and Three dimensional reconstruction of images, are under the supervision of Professor G.N. Ramachandran alongwith others. Experimental studies on biopolymer conformation are being conducted under the supervision of Professor V.S.R. Rao and others. The other areas include Structure of cyclic peptides, Helix-coil transition of biopolymers in solution. Seventeen scholars have been working at the Molecular Biophysics Unit in different areas of specialisation with fellowships awarded by CSIR(1); NIH(3); NCERT (2); UGC (2); I.I.Sc. (2); for their Ph.D. or post-doctoral work. The Unit has also undertaken Studies on Biopolymer Chain conformation with funds provided by the National Institute of Health, USA(Rs.3,93,280) for a period of three years. Some of the members of the staff of the Unit have worked in institutions within the country and abroad on teaching and research assignments such as, Biomolecular Conformation at the University of Michigan, University of Chicago, Princeton University, Purdue University, University of Montreal, University of Western Ontario, Cornell University, University of Washington, Harvard University, Oxford University, TIFR, Bombay, Central Leather Research Institute, Madras, Centre of Advanced Study in Physics, Madras University etc.

The staff of the Unit have been using the research facilities in Liquid Crystal Division of the Raman

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Research Institute. The computer facilities at the IIT Madras, TIFR Bombay are also being utilized to carry on work relating to x-ray crystal structure analysis and biomolecular conformation. This has been necessitated due to the limited computer memorary and time available on IBM 360-44 computer at the Institute.

Some of the major research equipment acquired by the Unit include (1)Jasco Spectropolarimeter(ORD machine), (2)CAT-1024 access ory for the NMR spectrometer, (3)Nelco Calculator, (4)IBM 029/C22 interpreting card punch, (5)Electro-magnet type HEM 150(6'), (6)X-ray Generator, (7)Weissenberg Goniometer. With the installation of Jasco spectropolarimeter in 1974, many research workers from Kanpur, Mysore etc. are making use of this machine and the Raman Research Institute also utilises facilities created in the Unit such as, CAT-1024 accessory to NMR spectrometer.

Use of ultracentrifuge, visible and ultraviolet spectrophotometer, Fluorimeter, NMR spectrometer, IBM 360/44 computer available in the Institute are also being utilised fully by the Unit in its research pursuits. A Pulse NMR Unit is being fabricated.

The Unit possesses 223 books and subscribes to 9 journals. It runs a workshop with one mechanic. The central library facilities of the Institute are also available to the Unit.

Academic programmes

In order to improve the standard of students joining for research in Biophysics, some preparatory courses are being given. These courses constitute the post M.Sc. diploma in Molecular Biophysics.

The Unit has to its credit 44 research publications in leading scientific journals in India and abroad during the period 1970-74. The works of the Unit in the areas of Biopolymer Conformation and X-ray Crystallography studies etc. have been outstanding.

The Unit has been experiencing some difficulties in carrying out its research activities due to non-availability of funds, competent research guide, additional research workers, technical assistance for fabrication and maintenance, lack of foreign exchange and lack of reliable Indian equipment, workshop/laboratory/data processing facilities etc.

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During the period 1971-73 to 1973-74, the Unit has been provided with Rs.92,322 and Rs.5,406 under Block and Plan respectively.

Proposed plan of development under the Fifth Plan

During the Fifth Plan, the Unit has planned to intensify its activities in the following areas:

a) Biopolymer Conformation which includes proteins, nucleic acids and their derivations and polysacoherides and sugars;

b) X-ray crystallograpy and NMR studies;
c) Three dimensional reconstruction;
d) Conversion of Cellulosic waste material into protein.

Studies on Biopolymer Conformation has been proposed to be undertaken on Theoretical Solution and on experimental basis. Theoretical studies will include-Non-planar peptide Unit, Folding of polypeptides and structure of Collagen; Cyclic peptides; Helix-coil transition of biopolymers in solution, Conformation of nucleic acids/ polyaccharides. Experimental studies will include-Solution studies (to give new ideas on the stability of the triple helical structures); Hydrodynamic studies; NMR spectroscopy (correlation between NMR coupling and angle in peptides); Larger cyclic peptides and antibiotics (high resolution NMR studies on conformational analysis of nucleotides and polysaccharides); X-ray crystallographic studies; Three dimensional Reconstruction (new technique has been developed for converting the information available in the shadow-graphs of a body into its full three-dimensional structure) and Cellulose-Protein Project (for conversion of cellulosic waste material into protein for food in collaboration with National Chemical Laboratory, Poona and Central Food Technological Research Institute, Mysore).

The Unit has asked for an equipment grant of Rs.15 lakhs for such items as Ultraviolet spectrophotometer (Rs.1.5 lakhs) Beckmann IR-11 grating spectrometer (Rs.4.5 lakhs), X-ray diffraction equipment (Rs.4.0 lakhs), ultracentrifuge, x-ray recorder, accessories for NMR etc. (Rs.5.0 lakhs).

The other non-recurring expenditure include, construction of suitable accommodation to house the laboratories (Rs.13 lakhs). For development of the areas of specialisation, the Unit has asked for the provision of one more Professor and two Lecturers besides non academic staff such as, stenographer, mechanics, clerks, fellowships and visiting scientists.

The present housing of the Unit is spread over a number of departments.

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EPARTMENT OF
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During the Fourth Plan, the Department of Organic Chemistry has made contributions in Synthetic Organic Chemistry, Chemistry of Natural Products and Theoretical Organic Chemistry, particularly in areas like Synthetic Steroids and Terpenoids, Stereo chemical investigation and Bioorganic Chemistry. The present staff position in the department consists of 5 Professors, 3 Assistant Professors and 6 others. The major areas of research in the department pertain to :

(a) Synthetic Organic Chemistry
(b) Physical Organic Chemistry
(c) Structure Determination (including X-ray Crystallography)
(d) Bio-organic Chemistry
(e) Interdisciplinary Areas
(f) Newly Developed Areas.

Ninety-five scholars have been registered for their Ph.D. in the Department of Organic Chemistry in its various areas of specialisation as indicated below:

Area	No. of students registered
Synthetic Organic Chemistry	39
Physical Organic Chemistry	29
Structural Organic Chemistry	18
Bio-organic Chemistry	4
Interdisciplinary Area	4
Newly developed areas	3
	95

Forty-four scholars have been working with senior/junior fellowships or scholarship or as Project Assistant etc. with fellowships/scholarship ranging between Rs.250/-to Rs.1000/-p.m.-I.I.Sc.(22);CSIR (15);UGC(4); other agencies, NCERT, GOI, UNICHEM (1 each). Besides offering courses and guidance to research scholars, the department has been implementing a number of research schemes such as, Synthesis of steroids, Bacterial genetics, Physico-chemical interaction in protein nucleoic acid and antigen-antibody model systems, Chemical models of enzymatic and immunological reactions, Chemical transformation of saturated fatty acid derivatives, Essential oils of Cinnamon, Development of electrical condensor fluids from indigenous resources etc. with provision of funds from agencies like CSIR, INSA, Indian Institute of Science, Bristol Myers Laboratory, USA, Unichem Laboratory, UGC, PL 480, ranging between Rs.2,950 to Rs.2,60,000 per scheme.

During the period 1965-74, three members of the staff worked in other institutions in the country and

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abroad on specific research projects like Studies on Steroids, Peptides, Metal Ammonia Reductions, Countries etc. at Arizona State University, USA, Australian National University, Canberra, Australia, UNESCO, Paris, University of East Anglia, U.K.

The departmental library possesses 632 number of books and subscribes to 11,043 journals. The department runs a small workshop with the help of 2 Mechanics. The Central Instruments and Services Laboratory of the Institute has been providing facilities to the Department in Glass Blowing and use of the following equipment:

1. T-60 Nuclear Magnetic Resonance Spectrometer
2. Mass Spectrometer
3. ORD and CD Spectrometer
4. UR-10
5. UV Spectrometer
6. IBM 360/44 Computer.

The research scholars and staff of the department have availed of the physical facilities available at the following institutions in India:

1. Indian Institute of Technology, Madras.
2. C.I.B.A., Bombay.
3. National Chemical Laboratory, Poona.
4. Central Drug Research Institute, Lucknow.
5. National Aeronautical Laboratory, Bangalore.
6. Bhabha Atomic Research Centre, Bombay.

The department fabricated the following equipment:

1. Thin-layer chromatography
2. Educational gas chromatographic kit

During the period 1971-74, the department has offered research facilities to research scholars from other institutions as indicated below:

	1971	1972	1974
N.M.R. Spectroscopic Service with HA-100D	44	172	159
Elemental Analysis Carbon, Hydrogen and Nitrogen	34	43	51
Gas Chromatographic Analysis	20-50	20-50	20-50
Infra-red analysis	140	60	93

During 1973-74, the department organised All-India Advanced Level Summer Institutes in Organic Reaction Mechanisms. The department has to its credit 109

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publications in scientific journals during the period 1965-74 in the different areas of specialisation.

Under the Fourth Five Year Plan, the Commission agreed to the creation of the posts of 1 Professor, 1 Assistant Professor and 3 Senior Research Assistants/Technical Assistants and all these posts have been filled up. The allocation of funds for research in the department during the period 1966-67 to 1973-74 under Block and Plan provision is indicated below:

Year	Block	Plan	Total
1966-67	37,951	-	37,951
1967-68	37,832	10,000	47,832
1968-69	53,516	4,466	57,982
1969-70	59,139	2,576	61,715
1970-71	75,065	2,804	77,869
1971-72	76,908	4,444	81,352
1972-73	79,885	4,769	84,654
1973-74	75,459	5,741	81,200
Total	4,95,755	34,800	5,30,555

The department is stated to have been experiencing some difficulties due to non-availability of funds, foreign exchange and technical assistance for fabrication and maintenance.

Proposed plan of development under the Fifth Plan

Under the Fifth Five Year Plan, the department has proposed to strengthen its activities in Synthetic Organic Chemistry, Physical Organic Chemistry, Structural Organic Chemistry, Bio-organic Chemistry. Besides, the department has plan to initiate new lines of work in the fields of Photo Chemistry, Organic Metallic Chemistry, Organic Chemical Geo-chemistry and Organic Chemistry of Agricultural Chemicals.

The Department of Organic Chemistry is one of the oldest in the Institute since its inception(1911). The major programmes for development during the Fifth Plan cover,(a)Problems of national and industrial interest, (b)Problems of academic interest.

The areas proposed to be developed during the Fifth Five Year Plan under its various fields of specialization are indicated below:

1. Synthetic Organic Chemistry

In view of the substantial contribution made by the Department in the field of Synthesis(theoretical and applied as well) during the Fourth Plan, programmes on

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development of Drugs and Intermediates and Industrial Process developments for Organic Fine Chemical and Pharmaceuticals have been proposed to be undertaken during the Fifth Five Year Plan. With the department undertaking synthesis of steroids and other biologically important compounds indigenously, the Indian industry would compete in the international scene. This would necessitate inputs in the form of equipment, staff and space. The immediate requirements of equipment include High Precision Gas Chromatograph, High Resolution Mass Spectrometer, Liquid Chromatograph and Recording U.V. Spectrophotometer. The Faculty is to be augmented by addition of 2 Assistant Professors and 3 Lecturers in the Synthetic Organic Chemistry Unit of the Department. Provision has also to be made of technical staff(one Senior Technical Assistant, 2 Junior Technical Assistants and 3 Laboratory Assistants) and additional space of about 4,000 sq.ft.

2. Physical Organic Chemistry

The department has been concerned with a variety of problems of fundamental importance, biological significance and technological interest.

The programme, therefore, for the Fifth Plan aims at strengthening the departments efforts on synthetic utility, fast reactions, application of quantum mechanics to problems of structure, study of stereoelectronic factors, topochemistry.

To achieve the objectives, the Unit has asked for the provision of 1 Assistant Professor and 2 Lecturers and additional space of 3,000 sq.ft.

3. Structural Organic Chemistry

With strong x-ray crystallography section, the structural Organic Chemistry Unit of the department has been able to illucidate structure of a number of natural products. Several other interdisciplinary areas of interest to the Institute as a whole are based on Structural Organic Chemistry.

To achieve the objective, the Unit has asked for some sophisticated equipment such as, Perkin Elmer Spectrometer Varian XL-100 NMR spectrophotometer, digital polarimeter and data card punching machine and an additional x-ray unit and an additional floor area of 3,000 sq.ft. has also been asked for. The Unit has requested for additional posts of 1 Assistant Professor and 2 Lecturer

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4. Bio-organic Chemistry

The Unit has specialised in three major areas e.g., Microbiological transformations, Chemical models of enzymatic reactions and Physicochemical interactions. During the Fifth Plan the Unit has desired to expand its activities and also to take up biosynthetic explorations in natural product chemistry. Lack of radioactive tracers is a major deficiency in Bio-organic Chemistry Unit. To make the Unit self-sufficient, provision of radiation monitor, Q.gas counter, coincidence counting liquid scintillation counter and a chromatogram scanner has been sought. The Unit has also asked for the provision of an additional floor area of 3,000 sq.ft. and services of additional posts of 1 Assistant Professor and 2 Lecturers in the field of Microbiological Transformations, Isotopic Synthesis and Bio-organic Mechanisms.

5. Interdisciplinary activities

Studies on Molecular Biology, Medicinal Chemistry etc. in the department are being carried out as an inter-disciplinary activities utilising the facilities and expertise available at the Institute such as, Chemical Engineering Department, Departments of Biochemistry, Inorganic and Physical Chemistry, Molecular Biophysics Unit, High Voltage Engineering, Microbiology and Pharmacology. The department has also undertaken joint collaborative programmes with a number of research institutions such as Raman Research Institute, Bangalore, Central Drug Research Institute, Lucknow, National Chemical Laboratory, Poona, Indian Institute of Technology, Kanpur and Department of Physics, Madras University.

6. Newly Developed Areas

The department has been implementing programmes in new areas in the field of Organometallic Chemistry, Photo-chemistry and Chemistry of Agricultural Chemicals.

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III. Division of Electrical Sciences

The Division of Electrical Sciences is composed of the Departments of (1)Electrical Communication Engineering including the Centre for Information Processing (2)Electrical Engineering (3)High Voltage Engineering and (4)School of Automation. All these departments are concerned with the laws governing the behaviour of electrical charges and the manner in which the knowledge can be put to service of mankind.

The Electrical Science has outgrown its traditional boundaries of generation, transmission and control of energy on one hand and communication of messages on the other. With the mastery over the art of control and communication, the electrical engineers are concerned with information acquisition and processing by electrical means. Remarkable advances in miniaturization of electronic devices to microscopic levels and their integration into functional devices capable of performing a whole range of operations have made this achievement possible. Electrical Engineering is concerned today with such escteric problems like obtaining pictures of various organs of human body not accessible to X-rays, recognition of patterns and sounds, with building conversational abilities into computers and so on.

The School of Automation and the Centre for Information Processing which were added to the parent department during the past five years or so reflect these new developments in the science of electrical engineering. These two schools share some of the activities of the older departments e.g. teaching and research, but they also liaise with outside organisation to a much larger extent, often taking their research problems from outside the Institute. The School of Automation works in close collaboration with the Computer and Process Control Industry while the Centre for Information Processing, which is funded by the Defence Ministry aims at serving the scientific needs of the defence alongwith similar laboratories elsewhere in the country.

The most recent addition to the Electrical Science Division is the Centre for Electronics Design and Training which has a joint venture with the E.T.H. of Zurich, Switzerland. This Centre is concerned primarily with work of immediate relevance to the rapidly growing electronics industry in the country, e.g. to train men sponsored by the industry in the current state of the electronics art, R&D activity oriented to the needs of the Electronics industry.

All departments in the Electrical Science Division

share things in common viz., research in pure and applied sciences and training of young engineers in the current state of the technology and methods of research. A change in the instructional pattern of the undergraduate and graduate courses has enabled the Division to introduce new developments in Science into the Engineering curricula in greater depth. The Unit System has brought into the electrical engineering curriculum more than 150 different courses. The Electrical Science Division has on its roll about 100 students at the B.E. and 150 students at the M.E. level and 60 doctoral students.

Besides instruction to Institute students, the Electrical Science Division has an on-going programme of short intensive course on topics of current interest for the benefit of the scientific community at large in the country.

During the last five years, the Division has organised about 15 such courses ranging from Quantum Electronics and Coding Theory to Digital Image Processing and Computer Applications to Power Systems and Industrial Controls.

The Division has also been running an evening school to enable scientists and engineers employed in Industry and R&D organisations to up-date their scientific knowledge. The Division has been rendering active consultancy services on a variety of topics such as, Computer Hard-Ware and Soft-ware, Power Systems, Lightning Arrestors, Radio Frequency Interference, Architecturals Acoustics, etc.

The plan of development for the years ahead pertains to (1) research and teaching aimed at acquiring new knowledge and disseminating it (2) industrial consultancy with the object of generating know-how appropriate for the local conditions and (3) providing continuing education to those whose formal training has ceased. During the Fifth Plan period, a certain proportion of individual ihitiative will be organised into group research or team work for the effective utilization of scientific research with a fair degree of continuity.

The staff position in the department comprises of 8 Professors, 7 Assistant Professors and 7 Lecturers. The major areas of research consist of (a) Acoustics (b) Communication Systems (c) Computers and Computer Sciences (d) Electron Devices (e) Electronic Circuits & Instrumentation (f) Microwave Engineering.

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(g) Interdisciplinary areas and other sciences. Each of the areas is headed by one or more Professors and assisted by other staff members in the field of specialisation. For the regular teaching the department has been utilising the services of specialists as Visiting Professors/ Assistant Professors. During the period 2964-74, some of the members of the Faculty have worked in institutions within the country and abroad on research problems like Solid State Electronics, Electron Devices, Atmospheric Noise, Acoustics, Microwaves, Communication Systems etc. at institutions like Tohoku University, Sendai, Japan; Philips Res. Laboratories, Eindhoven, Netherlands, University of London, Stanford University, University of Minnesota, Bangalore University, Regional Engineering College, Karnataka etc.

Twenty-one scholars have been working in the Department with some scholarship/fellowship financed by agencies like, Defence Ministry, CSIR, Atomic Energy Commission and I.I.Sc., Bangalore, with amounts varying between Rs.250/-to Rs.400/-p.m.

The department does not have any library of its own. The central library facilities are however available for use of the department. It runs a workshop with Milling machine, Lathes, Engraving machine, Sheet cutting machine, Gas equipment, with the help of workshop staff of 17. The Instrumentation/Glass Blowing facilities are available in the department. Some of the major research equipment available with the Department include-Beat frequency oscillator, Frequency analyzer, Microphone amplifiers, Audiofrequency spectrometer, level recorders, Tape recorders, Audiometer etc. and the auxiliary equipment include, oscilloscopes, desk calculator, IBM Card punches, Marconi Q-meter, signal generator, LCR bridges, Analog VTVMs, Microwave X-band spectrum analyzer, PRD slotted line, PRD microwave power sources etc. Most of the equipment obtained more than 15 years ago with the start of the postgraduate course in Engineering in 1957 have become out-dated and the spares are not readily available. It has become an urgent necessity to replace the present largely obsolete equipment by more modern ones. The staff and scholars of the department have made use of research facilities in other institutions in the country, such as , Hindustan Aeronautics Ltd., Bangalore, National Aeronautical Laboratory, Bangalore, TIFR Bombay, Bharat Electronics, Bangalore, Solid State Physics Laboratory, Delhi, Central Electronic Research Institute, Pilani etc. and research workers from other institutions have utilised the facilities available in the department such as, testing of the microwave components, getting acquainted with the techniquo of microwave measurements, studying the design

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and construction of the anechoic chamber and fabrication of surface wave delay lines, etc. Availability of equipment and other physical facilities in other departments has made it possible for the Electrical Science Division to pursue its research and teaching. The Department has to its credit fabrication of (1) electronic equipment such as digital multimeters, frequency counters, pulse generators, PCM generators and logic circuit testing equipment, etc. (2) microwave components such as waveguide junctions, directional couplers, attenuators, etc. (3) surface acoustic wave delay lines (4) glass-vacuum system for fabricating gas discharge devices, clean chambers and spinners, muffled furnaces, high current power supplies for chemical plating and chemical oxidation, curve tracers, thickness monitors etc. (5) anechoic chamber from completely indigenous material at a cost of Rs.1.75

The department organised seven seminar/symposia/ summer schools on topics like Microwave Engineering, Antenna Theory, Microwave and Quantum Electronics, Fourier Optics, Digital Image Processing, Microwave Hardware components, Error Correcting Codes during 1968-74.

The department introduced first year degree engineering courses for Science graduate. The admission is done on an all-India basis to attract the best talent available. Under the new scheme, the students can select select nearly 1/3 of their course according to their necessity, the rest being compulsory four courses. The system also permits the faculty to introduce new courses to reflect current trends in the rapidly growing field of electronics. The project work and certain topical subjects have been introduced at the B.E. level. The evaluation of the performance of the students is done on a continuous basis which includes, class work, home work and performance in sessional and final examinations, some of which are of the open book type. It is a wholly an internal grading system e.g. grade A(excellent), B(good), C(fair), D(marginal) and E(fail). By and large, the students work in a research environment and have opportunities to associate closely with senior faculty in their research work.

The Faculty has published a number of textbooks suitable for undergraduate and graduate needs. This include a series of monographs on solid state electronic instrument, system design using integrated circuits, electron devices, electronic navigations etc. The research activity of the department is reflected in its publication of 221 papers in scientific journals in India and abroad during the period 1965-74.

Some of the faculty members have been implementing

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specific research schemes such as, Non-linear Random Vibrations, Atmospheric Radio Noise, Microelectronics Circuitry, Development of Digital Voltmeter, Digital Computer, Dielectric coated metal cone aerials, Modulated surface Wave structures, etc. financed by agencies like Ministry of Defence, CSIR, UGC and PL-480.

The Department is stated to have been experiencing some difficulties due to non-availability of funds and foreign exchange.

The Commission, during the Fourth Plan, approved of the creation of posts of 1 Professor, 2 Assistant Professors which have since been filled up. The allocation of funds for research in the Department of Electrical Communication Engineering during the period 1966-67 to 1973-74 under Block and Plan provision is indicated below:

Year	Block	Plan	Total
1966-67	74,798	-	74,798
1967-68	72,021	-	72,021
1968-69	93,008	4,071	97,079
1969-70	92,299	4,716	97,015
1970-71	1,09,447	4,206	1,13,653
1971-72	1,14,347	5,882	1,20,229
1972-73	1,16,632	6,068	1,22,700
1973-74	1,19,257	6,743	1,26,0X
Total	7,73,824	23,284	7,97,108

Proposed plan of development under the Fifth Five Year Plan

The department has drawn up its research and development plans keeping in view the current trends in the field of Electronics & Communication, the requirements of the country, and the recommendations of the Reviewing Committee in 1969-70. A brief background of the proposed development of the different centres in the department is as below:

1. Establishment of the Centre for Information Processing (CIP) at the Institute

This centre, sponsored and financed by the Ministry of Defence, is concerned with the responsibility of conducting research in the area of Digital Communication, Optical Information, Processing, Speech Signal Processing and Microwave Acoustics. Many members of the ECE Department are associated with one or the other of the research projects being pursued at the C.I.P.

2. Electronics Training Centre (ETC):

This was established in collaboration with ETH,

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Switzerland, for the training of design engineers, the centre is likely to start functioning soon. The department will be closely associated with the working of the centre.

3. School of Automation:

The School of Automation has identified several projects for development which are based on industry-oriented research activity. The Electrical Communication Engineering Department is committed to the development of the School in several areas.

The Department has built up a tradition of research in three or four major areas over the past 25 years covering fundamental or unconventional lines of research which do not guarantee immediate success in the light of the Reviewing Committee's warning against losing sight of long-term goals in the pursuit of immediate results.

The proposal of the department for development covers five broad areas: (1) Communication Systems, (2) Acoustics, (3) Microwave Engineering, (4) Electronics and (5) Computer Science.

The nature of activity in each of these areas is as below:

(a) Communication Systems

i) Investigation of various possible methods of message processing at the transmitter and the receiver and their implementation in hardware,

ii) Design of suitable codes for reliable transmission over channels subject to noise bursts,

iii) Study of new methods of modulation,

iv) Evaluation of the relative performance of different transmission techniques.

b) Acoustics:

i) Investigation of the response of nonlinear vibrating systems to periodic and random excitations,

ii) Study of non-linear propagation of acoustic surface waves,

iii) Study of boundary value problems in room acoustics involving sound diffraction from openings,

iv) Development of methods of synthesising sound reinforcement systems,

v) Development of techniques processing of reverberant signals to improve intelligibility,

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vi) Computer simulation of the acoustics of proposed concert halls,

vii) Mathematical and physical models of human vocal tract,

viii) Development acoustic holographic techniques for the visualization of sound fields.

c) Microwave Engineering

i) Development of design procedures and techniques for fabricating the microstrip and strip-line components required for solid state microwave systems,

ii) Study of microwave circuits employing solid state microwave devices with a view to improving the power output and efficiency,

iii) Study of solid state devices (e.g. Gunn devices) operated in their limited space charge accumulation mode with a view to improving their power output and efficiency,

iv) Development of infrared systems for communication and remote sensing,

v) Development of techniques of spatial filtering for enhancing the image of a desired object over that of the background,

vi) Study of propagation characteristics of devices using reiterative wave beams,

vii) Development of antenna at millimetre and submillimetre wavelengths,

viii) Study of radiation characteristics of microwave antenna in the presence of plasma which is relevant to space communications.

(d) Electronics

i) Design and fabrication of field effect devices (Junction, MOS, MIS),

ii) Study and fabrication of Ga-As and photo devices (LED's, transistors, schottky barrier devices),

iii) Strengthening the fabrication facilities to take breadboard laboratory models of electronic equipment to finished prototypes,

iv) Design facilities for digital instrumentation and communication using IC's and other modern developments,

v) Interaction with and strengthening of the interdisciplinary solid-state electronics and materials laboratory planned as a central facility at the Institute,

vi) Establishing liaison with industries in designing fabricating and using integrated circuits.

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(e) Computer Science

i) Carry out theoretical studies in logic and switching,
ii) Develop software for minicomputers,
iii) Develop detection and recognition models for human observers to include perception and judgment,
iv) Develop techniques of spectral analysis and signal processing.

For the successful implementation of the programme of research, the Department has asked for the provision of equipment and other research facilities (which as usual would be available for research workers from other departments in the Institute or from outside) costing about Rs.17.15 lakhs.

The Department will also need some additional accommodation for successful implementation of its programme of teaching and research during the Fifth Plan periods.

DEPARTMENT OF ELECTRICAL ENGINEERING

The major areas of research in the department pertain to (a) Power Systems Engineering, (b) Industrial Electronics and digital circuits, (c) Control Engineering, (d) Biomedical Engineering including instrumentation and Computer applications to Biomedical signals/pictures, (e) Remote sensing, (f) Active networks and Computer Technology and (g) Material Science/Solid State devices. Each of the major areas is under the supervision of one or more Professors assisted by other members of the faculty in the area of specialisation. The Faculty consists of 8 Professors, 4 Assistant Professors, 3 Lecturers and 3 Others.

The Central Library facilities with 1,85,000 books and 2,000 journals manned by 20 members of the library staff are available for use by the department. There is no separate departmental library. The department runs a workshop with the help of 4 mechanics providing facilities for Electronic fabrication and Instrumentation.

Ten research scholars have been working in the Department with fellowships ranging between Rs.250/- to Rs.1000/- p.m. Some of the members of the faculty have worked in institutions within the country and abroad during the period 1963-74 on research projects like Digital Instruments, Computer picture processing, Remote Sensing, Computer aided analysis of power protective system, Automatic Control, Solid State Electronics, Active Filters etc. at University of New Brunswick, IBM Watson Research Centre, New York, University of Manchester, Moscow Power Research Institute, Yale University, University of Liverpool, University of Calgary, etc. The department has 181 publications to its credit during the period 1966-74

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in scientific journals in India and abroad. Besides guiding the research scholars, some of the faculty members have taken up research schemes financed by agencies like I.S.R.O., C.B.I.P. on topics like Remote Sensing for resource survey(Rs.80,000 for one year), Hybrid Computer, Electronic Differential Analyzer, Static excitation for synchronous machines, Design and Development of sensitive Static relay using discrete components for feeder and motor protection (Rs.5,60,000- for five years). Some of the major equipment acquired by the department are: Network Analyzer, Dynamic Relay test Bench, Transient Analyzer, D.C. Network Analyzer, Relay Laboratory, Electronics Laboratory, Machine Laboratory, IBM 360/44 Computer.

Until December 1970, the staff of the department have been using the computer facilities available with TIFR, Bombay, HAL and NAL in Bangalore. In the area of computer picture processing facilities are being developed at the Institute for the first time. The research facilities available in the department are being utilised by workers from other institutions, such as, Network analyzer, Measurement test equipment etc. almost all Electricity Boards in the country and steel plants, fertilizer units and other institutions use the network analyzer facility available with the department. Use is made of Dynamic Relay test Bench by research students from other universities such as, from Baroda, Nagpur and Trivandrum. The Q.I.P. Programmes and external registration facilities of the department have promoted for effective utilisation of the facilities in the department by other research workers and scholars.

The physical facilities available with other departments in the Institute are also utilized for purposes of teaching and research, viz., IBM360/44 digital computer is available for data processing purposes, pilot model from drum scanner for scanning of small size pictures.

The equipment fabricated in the department include, (1) Transformer Analog Computer-to stimulate electrical machine equivalent Networks, (2) Transient Analyzer-to study the over voltage phenomena in high and extra high voltage transmission lines, (3) Design, development and construction of d.c. network analyzer for study of power system problems, (4) Thyristor control for cold steel roll Mill for BHEL, Bhopal, (5) Drum Scanner-for screening and reproducing pictures, (6) Dynamic Relay Test Bench-used for Transient analysis of high speed relay and (7) Solid state relays using discrete components-such as timers, time current relays, time voltage, relays etc.

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The Department has organised 4 seminars/symposia/ short-term courses on Computer Methods for Power System Analysis, Active Networks and Computer aided circuit design and control, Control Theory during the period 1968-73.

The Faculty has been active in curricula development and improvement in organizing new courses/subjects and continuous evaluation of students performance. Project work constitute an important area for both graduate and undergraduate studies in Electrical Engineering. Besides, the faculty members have been actively engaged in research in their specific fields of specialisation.

The department is stated to have been experiencing some difficulties in its research activities due to non-availability of foreign exchange, technical assistance and data processing.

During the Fourth Plan period, the positions of 2 Professors, 2 Assistant Professors and 4 Research Assistants/Technical Assistants had been created and all of them have been filled up. The allocation of funds for research in the department of Electrical Engineering under Block and Plan provision is as below:

Year	Block	Plan	Total
1966-67	93,767	-	93,767
1967-68	95,938	-	95,938
1968-69	1,27,457	855	1,28,312
1969-70	99,335	560	99,895
1970-71	1,08,216	4,867	1,13,083
1971-72	1,08,782	5,000	1,13,782
1972-73	1,14,048	5,084	1,19,122
1973-74	1,20,220	5,280	1,25,500
Total	8,67,763	21,646	8,89,409

Proposed plan of development during the Fifth Five Year Plan

The important areas in which the department desires to strengthen and expand its activity in R & D in the next Plan period are:

i) Power Systems
ii) Remote Sensing
iii) Power Electronics
iv) Biomedical Electronics
v) Applied Electronics
vi) Computer Sciences
vii) Solid State device electronics and magnetic materials.

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To develop and strengthen these areas, adequate provision of financial inputs have been sought.

The Commission has identified the Department of Electrical Engineering at the Indian Institute of Science, Bangalore, for developing an academic link with its sister department at the University of Liverpool for undertaking studies/research in the area-Performance and Control of Electric Power Systems-for a period of five years from 1975 under the Indo-British University Collaboration Programme. The programme envisages exchange of visits by faculty members/scholars on short or on long-term basis in pursuit of the agreed programme of research.

The IBUC Programme does not envisage provision of any equipment as such, but efforts are being made to procure the essential equipment needed in pursuit of the specific research projects under IBUC through the Colombo Plan Assistance.

EPARTMENT OF IGH VOLTAGE NGINEERING

The major areas of research in the department cover- (a)Electrical Phenomena in Gases and Vacuum, (b)Electrical Insulation Engineering, (c)Overvoltage phenomena, protection and H.V. measurements, Electric and Magnetic fields and Applications, (d)Electrostatic Machines and Applications and (e)Materials. Both fundamental and applied researches have been made in breakdown phenomena in solids, liquids and gases of considerable importance to high voltage transformers and cables. Experimental facilities for spraying liquids in vacuum to produce contamination free liquids for study of their dielectric properties have been set up in the department. Experiments have also been conducted on oxidation and gassing in transformer oil subject to electric stress. A Van de Graff generator has been constructed for studies in insulation.

The faculty position as on 31.3.1974 was 2 Professors, 6 Assistant Professors, 6 Lecturers and 7 Others. Each of the major areas of research is under the supervision of one or more Professors assisted by other faculty members in their respective fields of specialisation.

Some of the faculty members have been associated with teaching/research assignments in other institutions in India and abroad. Mention may be made of the participation of the faculty in research topics like High Voltage Engineering, Arc Studies, Gas breakdown studies etc. undertaken at the University of Oregon, USA, Rumania, University of Sheffield etc. During the period 1964-73, ten scholars have been working with fellowships, amounts varying between Rs.250/-to Rs.400/-p.m. to pursue research leading to

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Ph.D. Besides guiding research scholars , some of the members of the faculty have undertaken research schemes like Design and development of 2 MeV Van de Graff Generator, Manufacturing of silicon carbide, 400 kV Experimental Transmission Line, Design and Development of H.V. Airbreak switches isolators, etc., Lightning Arrester Appl. for EHV-400kV, Development of Voltage Time Characteristics on rod gaps, bushings, insulator strings, etc., Isolators using aluminium contacts, Radio interference measurements in insulators, Evaluating the performance of insulators and lightning arresters for operations in polluted atmospheres, Studies on liquid dielectrics etc., financed by agencies like Central Board of Irrigation, New Delhi, with funds ranging between Rs.26,188 to Rs.3,53,786 per scheme.

The Department has 51 publications to its credit in scientific journals in India and abroad during the period 1965-72.

The Department is provided with facilities of library, workshop, instrumentation as available in the Institute. The major research equipment acquired by the Department include, 3 Million Volts Impulse Generator, 200 cm Sphere gap for measuring high voltages, 200,000 ampere impulse current generator circuit, One Million volts testing transformer cascade. The physical facilities available at the NPL, New Delhi and at BARC, Bombay, are being utilised by the department in pursuit of its research.

The department has been providing its facilities to scientific workers from other institutions like BARC, Bombay, Bharat Electricals Ltd., Bhopal, Tarapore Power Station, Indian Standards Institute and Universities and IITs. The Electron Microscope and Computer facilities available at the Institute are being utilised by the department in its research projects. The department has to its credit fabrication of a large number of equipment such as, Power Frequency Flashover, Impulse Breakdown Voltages, Van de Graaff Generator, 500 KV and 160 KV Impulse Generators, Cathoderay Oscillograph, Transistorised Lightning stroke counter, Automatic Data Recording equipment, Fluid volume gauge measurements, High Voltage D.C., High Current shunts, Litchenberg Camera, Electrolytic Tank and Models, Silicon Carbide, Polarity Indicator, Discharge Detector, Solid State Power Devices, Semiconducting Glazes, Transistorised point on wave selector etc.

During the period 1969-72, the department organised seminars/short-term courses on High Voltage Technology.

The Department has been taking active interest in

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restructuring of its courses and research programmes through a team work.

The Department has been experiencing some difficulties in carrying out its research activities for non-availability of funds, competent research guides, research workers, technical assistance, foreign exchange, reliable Indian component, workshop, glass blowing facilities, data processing, library facilities etc.

During the Fourth Plan, posts of 2 Professors, 3 Assistant Professors and 4 Research/Technical Assistants had been approved, all of them have been filled up. The allocation of funds for research in the Departmental of High Voltage Engineering during the period 1966-67 to 1973-74 under Block and Plan provision is indicated below:

Year	Block	Plan	Total
1966-67	95,096	-	95,096
1967-68	87,414	-	87,414
1968-69	87,978	4,981	92,959
1969-70	96,259	4,889	1,00,148
1970-71	94,539	4,917	99,456
1971-72	1,01,434	5,000	1,06,434
1972-73	1,01,790	2,811	1,04,601
1973-74	1,10,314	686	1,11,000
Total	7,73,824	23,284	7,97,108

Proposed plan of development during the Fifth Plan

The departmental work has been proposed to be extended to cover studies in electric arc phenomena, corona loss and commercial exploitation of the various devices developed during the past.

SCHOOL OF AUTOMATION

In accordance with its goal of application oriented and industrial research, the School of Automation has built up during the Fourth Plan period an infrastructure that brought the activity of the school to the attention of a large number of R& D organizations. During this period the school has built up laboratory facilities for instruction in digital systems, analog computation, servosystem, picture processing, fluidics and instrumentation. The School has developed a successful and much sought after Master's degree programme of an interdisciplinary character. Students are admitted to this course on the basis of a tough competitive examination from several engineering disciplines. The students in the course receive a balanced training in the theoretical and experimental techniques including

computer hard and software. Research work leading the award of Ph.D. has already been initiated in the areas of simulation, analysis and design of large scale systems, control instrumentation, computer soft-ware, etc.

Twenty-seven students have been admitted for their-Master's degree course during 1974 session and 17 students have been registered for their Ph.D. at the School.

The School has a staff of 3 Professors, 8 Assistant Professors, 1 Lecturer and 6 Others(as on 31.3.1974). The major areas of research at the School pertain to -

a) Large scale Systems: Analysis, simulation and optimization
b) Digital systems.
c) Computer Software
d) Control and Instrumentation
e) Pattern Recognition and Image Processing

Each of the major areas is under the supervision of one or more Professors assisted by other members of the Faculty in their respective fields of specialisation. Seventeen of the research scholars have been working at the School with some fellowships given by agencies like UGC, CSIR, Indian Institute of Science and the Ministry of Education(under Quality Improvement Programme)with scholarship amount varying between Rs.250/-to Rs.500/-p.m. Besides guiding research scholars for their Ph.D., the School has undertaken a number of research schemes such as, Pilot handling qualities in combat environments, Automatic Terrain Following System ,Water level control system for surge tanks in Cauvery water supply scheme, On-line trajectory computations as sponsored by agencies like Aeronautics R&D Board, Bangalore Water Supply & Sewerage Board, Research Electronics Limited, Bangalore with provision of funds ranging between Rs.10,000 to Rs.2,86,000 per scheme.

The School does not have a separate library of its own but draws support from the well equipped central library of the Institute. In addition to regular library grants, a sum of Rs.50,000 out of the Schools grant has been spent so far for acquiring publications and journals of particular interest to the School. The School runs a workshop with 11 mechanics/helpers providing facilities like Lathes, Universal milling machine, Band saw machine, Treadle Operated Guillotine machine, Drilling machines, Engraving machine and Coil winding machine. Some of the major equipment acquired by the School include, MN-7 Analog Computers, MN-10 Analog Computers, AC-20 Analog Computers, Medium sized Hybrid Computer, Drum Scanner for picture digitization.

The School has to its credit frabication of equipment

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like Logic Trainer, Temperature Control System, Phenumatic Servo-system, Drum Scanner, Hydraulic Regulator, Experimental Flight Simulation Facility, etc.

The IBM System 360/44 digital computer available at the Institute is being extensively used by the faculty of the School for computational needs arising in connection with research work. The existing laboratory facilities of the School are being used extensively by other departments of the Institute in their teaching and research work as well as from other universities/institutions and industries/R&D organisations.

The School has organised 11 seminars/symposia/workshops/intensive courses between 1971 and 1974 on topics like, Computer Simulation, Optimization Techniques, Instrumentation and Control, Computer Methods in Power Systems, Computer Organization and Systems Programming, Integrated Circuits and Applications, Digital Image Processing, Probability Engineering, Industrial Automation etc.

The School was started during the Fourth Plan period with a provision of Non-Recurring grant of Rs.40,00,000. During 1969-74, an amount of Rs.20 lakhs has been sanctioned, leaving a balance of Rs.20 lakhs to be paid by the UGC towards the cost of the Hybrid Computer.

The School is stated to have been experiencing some difficulties in its research activities due to lack of grants, foreign exchange, components and accessories. During the Fourth Plan period, the following posts had been created. The position is indicated below:

	Posts approved	Posts filled up
Professors	6	5
Asstt.Profs.	9	9
Lecturers	3	1
Sr.Research/ Asstt./Technical Asstts.	7	5

The allocation of funds for research in the School of Automation during 1969-70 to 1973-74 is as below:

Year	Block Rs	Plan Rs	Total Rs.
1969-70	42,247	-	42,247
1970-71	91,898	-	91,898
1971-72	1,47,750	-	1,47,750
1972-73	2,34,630	-	2,34,630
1973-74	2,57,265	-	2,57,265
	7,73,790	-	7,73,790

The School has been attaching a great deal of importance in teaching and academic programmes. It has formulated a course plan, fitting within the Unit System of instruction in operation at the Institute, with a strong emphasis on hard-ware and laboratory work. The School has taken up steps to correct the inadequate exposure of the students to modern hardware at the undergraduate level and to further motivate and promote them to undertake the challenging application oriented work so as to combine Control and Computer Sciences in a systematic way as the means for developing expertise in the field of industrial automation.

Proposed programme of development during the Fifth Plan

A strong infrastructure has been developed to facilitate in carrying out application oriented research and development programmes and postgraduate instruction during the initial phase of 1969-74. Under the Fifth Plan, the School has planned to forge ahead with the research and developmental projects in the areas of computer aided industrial automation to cover important activities like-

1. To develop competence in the area of Analysis of Industrial System with emphasis on Management Information Systems aimed at increasing the production. This is being developed at present by a large scale systems group and is expected to become one of the major research areas in the near future.

2. Development of sophisticated experimental facilities in the areas of Industrial Control Systems and Pattern Recognitions. The Industrial Control Systems Laboratory would constitute the nucleus around which further R&D work in this area of vital importance to industrial development in the country.

3. Development of indigenous Hybrid computer jointly with ECIL as a basic design tool for industrial control systems development. The Department of Electronics, Government of India has already sanctioned Rs.55 lakhs for this activity.

The existing activity in the area of designing complex industrial drive systems and associated control system is very small compared to the needs. As per a recent report on Industrial Drives and Controls, the Fifth Plan needs for the Drive Control Hardware is estimated to be about Rs.40 crores. A major portion of this has to be provided in foreign exchange. If the equipment is designed and built in the country using important components where necessary, the total foreign

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exchange requirements will be only a small fraction of what is being otherwise incurred. This would help in developing much needed system design know-how in the area of interacting drive systems.

The project is expected to bring together the academic institutions such as the Indian Institute of Science and the major CSIR laboratories, namely, the National Aeronautical Laboratory.

IV DIVISION OF MECHANICAL SCIENCES

The Division consists of (1) Department of Aeronautical Engineering (2) Department of Chemical Engineering (3) Department of Civil Engineering (4) Department of Industrial Management (5) Department of Mechanical Engineering and (6) Department of Metallurgy.

DEPARTMENT OF AERONAUTICAL ENGINEERING

During the Fourth Plan period, M.E. courses in Rocket and Missiles funded by the Ministry of Defence (started in 1968) has been strengthened. A flight course was started with a Pushpak aircraft obtained in 1967. Considerable research activity has been going on during the Fourth Plan period in the areas of Fluid Mechanics, Aerodynamics, Solid Mechanics, Structures, Propulsion and Combustion. Work has also been initiated in the areas of Guidance, Instrumentation and Control.

The staff in the department consisted of 9 Professors 10 Assistant Professors, 13 Lecturers and 11 Others as on 31.3.1974. Sixty-four students had been pursuing their M.E./M.Tech. in Aeronautical Engineering and 15 students were registered for Ph.D. (as on 1.4.1974). The major areas of research in the department pertain to :

a) Aerodynamics & Fluid Mechanics
b) Structures & Design
c) Propulsion
d) Guidance & Control
e) Flight Course

Each of these areas is under the supervision of one or more Professors assisted by other faculty members with their respective fields of specialisation.

Fourteen scholars have been working with fellowships awarded by agencies like UGC, CSIR, Indian Institute of Science, Bangalore, with amounts varying between Rs.250/- to Rs.500/- p.m. Besides the research scholars working in the Department for Ph.D., other workers with either Senior Research Fellowship or employed as Project Assistant/Research Associate/Senior Scientific

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Officer/Technical Assistant and Junior Research Fellows have been working on specific research schemes such as, Hybrid Rocket Motor, Structure of Shock Wave, Composite Solid Propellant Rocket, Hypersonic Tunnel, Satellite Altitude Control, Random Vibration of Stiffened Panels, Turbulent Flow, Development of Laser Dropplor Anemometer, etc.

Some of the members of the faculty have worked in other institutions in the country and abroad on specific research projects like Shock Structure, Current techniques in Vibrations and Aeroelasticity, Wind effect on Buildings and Structures, Hydraulics and Fluid Mechanics etc. at California Institute of Technology, Universities of Stanford and Princeton, USA, University of Sydney, University Southampton, USA, Royal Netherlands Aircraft Factories, Imperial College of Science and Technology, London, Lockheed Georgica and Co., USA, Duke University, USA, Manash University, Australia, University of Strathclyde, etc. during the period 1965-66 to 1974-75.

The Department does not have its own library but the central library facilities are fully utilised. It runs a workshop with 26 Mechanics/Helpers. Each research group has organised some limited facilities for instrumentation. Some of the major research equipment acquired by the Department include, Wind Tunnels, Shock Tube, Photoelastic Polariscope, Fatigue Testing Machine, Universal Testing Machine, Creep Testing Machine, Strand Burner, Rocket Motor Test Bench, Brittle Lacquer Equipment , Specific Impulse Bomb, Guidance and Electronic Instrumentation, Flight Simulator, Pushpak Aircraft with Some Flight Instruments.

The physical facilities available in other departments of the Institute are being fully utilised in pursuit of teaching and research in Aeronautical Engineering. Facilities and expertise available in the department are being used by other institutions/organisations like National Aeronautical Laboratory, Bangalore, Hindustan Aeronautics Limited, Bangalore, Vikram Sarabhai Space Research Centre, Trivandrum. Other institutions/organisations which have access to the physical facilities and expertise of the Department include-Hindustan Aeronautics Limited, Defence Research and Development Laboratory, Naval Research Laboratory, Atomic Power Project, Kalpakkam, Railway Design and Standards Organisation, Central Water and Power Commission, Ministries of Transport and Defence, IIT, Bombay, etc.

The department has to its credit fabrication of the following equipment for use in various laboratories:

a) Wind Tunnel for student training, research work and calibration;
b) Precision Projection type Manometer;

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c) Photoelastic Polariscope; and
d) Hot Wire Anemometer

The department has organised 25-30 seminars annually in some of which leading scientists from abroad participated. The department has been taking keen interest to bring about improvement in teaching, examinations by introducing revision of syllabus, teaching methods, tutorials, examination with open notes, assignments, viva-voce, etc.

Department appears to have been experiencing some difficulties in its research activities due to lack of motivated students(they prefer jobs to research), foreign exchange for developing instrumentation.

The department has to its credit 243 publication in scientific journals in India and abroad during the period 1965-74.

Besides guiding research scholars for their Ph.D., some members of the faculty have been actively pursuing specific research schemes sponsored by agencies like PL-480, Defence, ISRO, CSIR, etc. on topics of Properties of Plywood, Rarefield Gas Dynamic, Solid Propellants, Analysis & Design of Structural joints in flight vehicles, Random Vibrations, Study of flow phenomena over bodies during re-entry into earth's atmosphere, Analysis of aircraft wing type structures, Development of signal unit for missile applications, Design and development of laser doppler anemometer, Hybrid Rocket Motor, Solid Propellant Rocket, Elastic shell structures, Experimental investigations on dynamic characteristics of aircraft structural components and materials, etc. with provision of funds ranging between Rs.7,000 to Rs.20,00,000 per scheme.

During the Fourth Plan period, positions of 2 Professors, 4 Assistant Professors, 2 Lecturers and 4 others had been created, all of which have been filled up. Allocation of funds for research in the department of Aeronautical Engineering during 1966-67 to 1973-74 under Block and Plan provision is indicated below:

Year	Block	Plan	Total
1966-67	84,845	-	84,845
1967-68	1,01,235	-	1,01,235
1968-69	95,371	6,903	1,02,274
1969-70	93,793	6,044	99,837
1970-71	1,26,617	6,545	1,33,162
1971-72	1,14,620	6,000	1,20,620
1972-73	1,25,774	6,002	1,31,776
1973-74	1,24,360	6,140	1,30,500
Total:	8,66,615	37,634	9,04,249

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Proposed programme of development during the Fifth Plan period

The on-going research activities of the Department are proposed to be intensified and continued. Meterological Fluid Dynamics will receive special attention. Design and development of8" diameter hypersonic tunnel sponsored by the Ministry of Defence, will receive considerable attention. Tempo of work in the area of Rocket and Missiles both in teaching and research is expected to increase. The planned activities in the department would cover, fields of Aerodynamics, Structures, Propulsion and Guidance and Control. Hypersonic Tunnel, Shock Tube, VSTOL Tunnel Rocket Propellant Laboratory facilities etc. have been proposed to be developed during the Fifth Plan period.

EPARTMENT OF HEMICAL NGINEERING

During the Fourth Plan period, the department has built up a strong base for work in Reaction Engineering, Thermodynamics and Transfer Processes, with emphasis on teaching and research in these areas. Work was also started in the areas of Biomedical Engineering and Environmental Engineering. The department has developed know-how about a number of processes of relevance to the needs of small and medium scale Industries.

The staff in position as on 31.3.1974 consisted of 3 Professors, 6 Assistant Professors, 6 Lecturers and 2 Others. The enrolment in M.E./M.Tech. stood at 23 and 19 students have been registered for research as on 1.4.1974. The major areas of research in the department pertain to (a)Reaction Engineering, (b)Transfer Processes (c)Thermodynamic & Transport Properties. Each of these areas has been functioning under the supervision of one or more Professors assisted by other members of the faculty in their respective areas of specialisation. Other research areas developed in the depart ent include Polymer Technology,Bioengineering, Environmental Engineering, Process Dynamics & Control and Design Cell under the supervision of Professors and other faculty members with their specialisation. Seventeen research scholars have been working in the department with scholarship/followship ranging between Rs.250/-to Rs.690/-p.m. awarded by agencies like CSIR and the Indian Institute of Science, Bangalore. Besides guiding research scholars in pursuit of their Ph.D., some of the faculty members took up specific research schemes, such as, Preparation of Jelly like products from Liquid fuels; Investigations in the Preparation of Combustible Polymers, Azeotropic dehydration and extraction in the production of concentrates from materials bearing essential oils, Studies in Gas-liquefaction and solidification cycles, Catalytic conversion of Butyl Alcohol from Ethyl Alcohol, Oxidation of Acetaldehydre to Acetic acid financed by agencies like Defence Research & Development Board and

CSIR, amount ranging between Rs.19,000 to Rs.98,000 per scheme.

Some of the faculty members have worked in other institutions in the country and abroad on specific research activities such as Reaction Engineering, Nucleate Boiling, Thermodynamic & Physical Properties, Three-phase Fluidization, Research Heat & Mass Transfer, Absorption Spectroscopy of Proteins in solution etc. at institutions like Monash University, Australia, Leeds University, U.K., Texas A & M University, USA, University of British Columbia, Canada, University of Bath, U.K., University of Birmingham, U.K., Waterloo & Montreal Research University, Canada, Purdue University, USA, National Chemical Laboratory, Poona IIT Kanpur etc. during the period 1965-72.

The department possesses 1200 books and the central library facilities with books and journals are available for utilisation by the faculty and the scholars of the department. The department runs a workshop.

The major equipment in the department include Vapour Phase Chromatographs, Porosimeter, B.E.T. Apparatus, Vapour-liquid Equilibrium Stills and Pulfrich Refractometer. Other equipments in the department include IR Spectrophotometer, NMR Spectrophotometer, Schleiren, Computer IBM 360-44. The department has to its credit fabrication of the following equipment:

1. Momentum Balance
2. Variable Weight Flow Meter
3. Constant Pressure Gas Collecting Device
4. Differential Thermal Analyser
5. Stirred Reactor
6. B.E.T. Apparatus
7. Vapour-Liquid Equilibrium Still

The Department organised a number of research seminars and summer schools on topics like Enthalpy of Multi-Component System; Translational Relaxation and Rotation Relaxation; Effect of Liquid Channelling on distillation plate efficiency; Research in Electrochemical Engineering; Mass Transfer to Granular material and prediction data for active carbon filters; Scale of Electro-lytic Cells, Biochemical Engineering, Structure of the Interphase, Recent advances in Commercial Distillation, where a number of distinguished specialists from abroad participated.

The Department has contributed to 288 research publications in scientific journals in India and abroad during the period 1965-73.

During the Fourth Plan, the number of positions

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approved included 1 Professor, 3 Assistant Professorsand 3 Lecturers, all of which with the exception of one lecturer have been filled up. The allocation of funds for research in the Department of Chemical Engineering during the period 1966-67 to 1973-74 under Block and Plan has been as below:

Year Rs	Block Rs	Plan Rs	Total Rs
1966-67	91,508	-	91,508
1967-68	1,07,271	-	1,07,271
1968-69	1,06,949	4,951	1,11,900
1969-70	1,03,173	2,366	1,05,539
1970-71	1,13,786	5,761	1,19,547
1971-72	1,15,635	6,000	1,21,635
1972-73	1,20,324	4,635	1,24,959
1973-74	1,22,504	6,496	1,29,000
Total:	8,81,150	30,209	9,11,359

The Department has stated to have experienced some difficulties in carrying out its research activities like non-availability of funds, foreign exchange, research guides, research workers, technical assistance, workshop/library facilities, etc.

Proposed programme of development during the fifth plan

The department has proposed to consolidate the present activities and also to undertake mission oriented research. Design of chemical plant constitutes one of its priority areas. Design of internal organs and industrial pollution are also included as part of its activities during the Fifth Plan. The departmental activity is aimed at industrial exploitation for small and medium scale industries from the laboratory stage.

The implementation of mission oriented research would require not only consolidation of its present activities in the areas of reaction engineering, thermodynamics and transfer processes but also intensification of activities in other areas which would bring together in achieving its goal such as design of chemical plant.

The programme envisages the establishment of design procedures for a variety of reactors, transport and separation equipment.

It is also necessary for the department to strengthen the existing facilities for Biomedical and Environmental Engineering for enabling it to take up studies on problems associated with the design of internal organs and

industrial problems.

Simultaneously with the regular courses leading to M.E./M.Sc./Ph.D. degree in chemical engineering in its various areas, the department has proposed to make its expertise available to members of other teaching and industrial organisations by way of offering training facilities , in special courses organisation of summer and other short-term courses and preparation of textbooks, etc. The department has been functioning in close collaboration with various industries which has been proposed to be strengthened by fostering closer cooperation by way of offering courses to industrial personnel and encouraging members of the faculty to spend part of their vacation in the industries.

DEPARTMENT OF CIVIL ENGG.

During the Fourth Plan period, the research activities in the department have been in the broad areas of structural mechanics, fluid mechanics and geo-mechanics with inter-disciplinary approach in the fields of random vibrations, turbomachines and environmental engineering.

The staff in the Department of Civil Engineering consists of 5 Professors, 8 Assistant Professors, 6 Lecturers and 5 Others as on 1.4.1974. The research enrolment rose from 18 in 1966 to 24 in 1974. The admission however at the M.E./M.Tech. level fell from 60 in 1966 to 26 in 1974. The major areas of research in the Department pertain to:

a) Structural Mechanics
b) Fluid Mechanics
c) Geomechanics
d) Civil Engineering Systems
e) Interaction Studies

Each of these areas are under the supervision of one or more Professors assisted by other faculty members in their areas of specialization. Twenty-seven research scholars have been working in the department with fellowships ranging between 400 to Rs.1000 p.m. awarded by agencies like CSIR, UGC and the I.I.Sc. Bangalore. Besides guiding the research scholars in their Ph.D. work, some of the faculty members have undertaken specific research schemes on topics like Cavitation, Turbulence, Minimisation of losses, Experimental stress analysis, Instrumentation, Soil Vibrations, Rock Mechanics, Load capacity of dams, Bearing capacity of foundations, Warping stresses in airport runway, Cavitation in Hydraulic Machines, etc. with funds amounting to Rs.11,00,000 provided by agencies like Central Board of Irrigation and Power and CSIR.

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Some of the faculty members have worked in other institutions in the country and abroad on specific research schemes like Soil Strength, Experimental Stress Analysis, Soil Fabric, Cavitation, Earthquake Engineering, Hydromechanics, Foundation Engineering, Structural Dynamics, Computer Analysis of Structures, Soil Mechanics and Foundation Engineering, Concrete structures, etc., at institutions like Purdue University, USA, Catholic University of America, USA, McGill University, Canada, University of Glasgow, U.K. Urdue University, Brooklyn, Polytechnic Colombia University, USA, Monash University, Australia, University of Munchen, West Germany, Technical University, West Germany, University of Karlsruhe, West Germany, University of Bochum, West Germany, University of Liverpool, U.K., University of Leeds, U.K., University of Stuttgart, West Germany etc. during the period 1965-74.

The department has to its credit about 400 publications in scientific journals in India and abroad during the period 1965-73.

The library, workshop and instrumentation facilities as available at the Indian Institute of Science, Bangalore, are being utilised by the Department in its research and teaching pursuits.

The equipment procured by the department include- 100 ton universal testing machine; concrete cutting, sliding and polishing machine; photoelastic polariscopes, static and dynamic measuring bridges; vibration generators and accelerometers, triaxial set-ups; lazan oscillators; motorized direct shear apparatus; drilling rig; flumes of various sizes & tilting flume; rotating disc set-up for cavitation studies; high velocity liquid jet impact set-up for cavitation studies; high speed movie camera with accessories; industrial analyzer, cathode ray oscilloscopes; 18 channel recorder etc. Facilities such as x-ray diffraction, electron microscopy and computer; Rating tank; Towing tank etc. available with other institutions like TIFR, Bombay, IIT, Madras, Karnataka Engineering Research Station, Mysore, have been utilized by the faculty members in pursuit of specific research projects. The department fabricated a number of equipment such as Water tunnel; 100 ton capacity self straining loading frame; High discharge low head contri-fugal pumps; Flow measuring devices; Diffusion and deflection polariscope; Testing frame etc.

The department organised seminars/short-term courses on Cavitation, Water Resources, Analysis and Design of Foundations, Vibration Problems in Civil Engineering during the period 1969-74. The department has introduced unit system providing maximum option for students to pursue

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advanced studies.

The department has been facing some difficulties due to non-availability of funds, foreign exchange, technical assistance and workshop/glass blowing and other facilities.

During the Fourth Plan, positions of 1 Professor, 3 Assistant Professors and 3 Lecturers were created for the department, all of which have been filled up. The allocation of funds for research in the department of Civil Engineering during the period 1966-67 to 1973-74 under Block and Plan has been as below:

Year	Block	Plan	Total
1966-67	1,38,261	-	1,38,261
1967-68	1,20,369	-	1,20,369
1968-69	1,24,977	6,549	1,31,526
1969-70	1,20,272	3,587	1,23,859
1970-71	1,32,449	6,855	1,39,304
1971-72	1,37,013	7,000	1,44,013
1972-73	1,33,297	2,662	1,35,959
1973-74	1,47,876	7,124	1,55,000
Total:	10,54,514	33,777	10,88,291

PROPOSED PROGRAMME OF DEVELOPMENT DURING THE FIFTH PLAN

During the Fifth Plan, the department has proposed to intensify research work in the areas like Structural Mechanics, Fluid Mechanics and Geo-mechanics and also to take up projects relevant to national needs e.g. to develop new building, cementation and vacitation resisting materials, study low cost construction techniques, deformation and flow characteristics of rocks and soils with greater emphasis on water resources engineering. Random Virbation, Turbomachines and Environmental Engineering would constitute major activities of inter-disciplinary nature. In addition to M.E. degree courses, a number of new electives have been proposed to be introduced to take into account the expanding horizon of available knowledge as well as newer areas of inter-disciplinary nature.

The department is making conscious effort in the teaching programme to produce competent design engineers as well as experimental scientists. During the Fourth Plan period 100 students have completed the M.E. programme given by the department. The department has proposed to introduce some specialised courses for Ph.D. students. The expertise and the facilities in the department have been proposed to be utilised by organising seminars, symposia and short-term courses for the benefit of teachers from other engineering colleges/institutions. The department will also assist a BE

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degree programme proposed in the Institute in the Fifth Plan in the area of Building Science & Technology.

EPARTMENT OF NDUSTRIAL ANAGEMENT

Major studies undertaken by the department during the Fourth Plan pertain to Effects of Thermal Environment, Economic effects of seasonal variation in Agro Industries in Karnataka, Shifting corporate income tax in India during 1950-65, Personal adjustment among industrial workers, Evaluation of employees state insurance and provident fund schemes, social and psychological study of unemployed engineers, strategic sector-axis of accelerated economic development, studies in dividend policies Behaviour of capital output ratio and a Study of two factory theory of job satisfaction.

The department has been running a one year full-time postgraduate course in Industrial Management and offers a number of elective subjects to students from other departments. It has also been conducting a series of Management development programmes for outside agencies.

The staff of the department consisted of 1 Professor, 5 Assistant Professors, 1 Lecturer and 3 Others as on 1.4.1974. The student enrolment for the diploma course stood at 10 on 1.4.1974 and the research enrolment came down from 11 in 1966 to 7 in 1974.

The major areas of research in the department pertai to:(i)Job satisfaction, (ii)Organisation theory, (iii)Ergonomics (Human factor engineering), (iv)Organisational climate,(c)Mental health problems in industry,(vi)Creativity,(vii)Cash Management , (viii)Corporate taxation,(ix)Agro-industries, (x)Production planning and control,(xi)Economic Planning and industrial development(xii)Materials management and(xiii)Marketing management. Each of these areas has been under the supervision of a Professor/Assistant Professor. Seven research scholars have been working in the department with followship/scholarship ranging between Rs.250/- to Rs.400/-p.m. warded by agencies like, UGC and Indian Institute of Science,Bangalore. Besides guiding the research scholars, some of the faculty members have undertaken specific research schemes such as Small Scale Industries, Effectiveness of Industrial Estates, Fifth Plan of Mysore, Pricing and Investment policies of Public Utilities in Mysore, State level Planning in India- Methods and Procedures, Study of leave taking problem, etc. as financed by agencies like Banking Commission, Government of India, Indian Council of Social Science Research, Planning Department, Government of Mysore, etc. with funds ranging between Rs.5,000 to Rs.16,000 per scheme.

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Some of the faculty members have worked in other institutions in the country and abroad on specific programmes of research/teaching e.g. Ergonomics, Occupational Safety, Economic Planning, Materials management, etc. at institutions like Loughborough University of Technology, U.K. International Labour Organisation, Geneva, Institute of Social Studies, The Hague, Netherlands, University of Technology, Findhoven, Netherlands, Laboratories de Physiologia due Travail, Paris etc. between the period 1968-73.

The departmental library possesses about 500 volumes of books and the central library facilities of books and journals are being utilised by the department. The departmental library is manned by one library staff. The department has Ergonomics Laboratory and Work Study Laboratory. The department has fabricated equipment like Bicycle Ergometer, Skin Temperature measuring instrument, Psychrometric Chamber etc.

The department has to its credit 114 publications in scientific journals in India and abroad during the period 1965-74.

During the Fourth Plan, positions of 2 Assistant Professors, 2 Sr. Research Assistants/Technical Assistants had been approved, all of which have been filled up. The allocation of funds for research in the Department of Industrial Management during 1966-67 to 1973-74 under Block has been as below:

Year	Block Rs.
1966-67	15,129
1967-68	14,212
1968-69	9,785
1969-70	11,690
1970-71	13,227
1971-72	15,857
1972-73	17,209
1973-74	19,000
	1,16,109

The department is stated to have experienced difficulties due to non-availability of funds, competent research guides, research workers, technical assistance for fabrication and maintenance, foreign exchange, equipment workshop/glass blowing and other facilities like data processing and library facilities.

PROPOSED PROGRAMME OF DEVELOPMENT DURING THE FIFTH PLAN

The department has proposed to taper off some of the

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research activities going on in the department with emphasis on management of science and technology and to function as an industrial consultancy centre. The department has also proposed to start a full-time two years' course in Industrial Management in place of the existing one-year postgraduate diploma course. During the Fifth Plan, special efforts have been proposed to be made to initiate the following studies:

a) Studies relating to the impact of R&D expenditure in industry;

b) Economic criteria in the allocation of national R & D resources among industries/laboratories/activities;

c) Innovative research, technological change and economic development;

d) Science, technology and agro-industrial development;

e) Ergonomics(Human factor Engineering);

f) Materials management with special reference to R & D organisations;

h) Human resource management in scientific, research and development organisations;

i) Technological forecasting.

The proposed programme of the department will have more quantitative and practical bias. As recommended by the Reviewing Committee the department has proposed to introduce suitable courses for M.E. students of the Institute in Humanities and Management subjects. For the B.E. students, Industrial Economics and Industrial Psychology courses are being offered which have been proposed to be continued.

Under the Unit System, more and more students from other departments are taking courses in various areas of Management offered by the department. This will continue. The department has planned to offer short-term courses for practising managers in various functional areas of management as a part of continuing education programme of the Institute. The consultancy services in areas like Industrial Planning, Management Development Programme, Marketing Research , Financial Management and Control, Materials Management etc. would continue to be offered by the department as before.

In view of the proposed development programme of the department during the Fifth Plan, the up-dating of the professional competence of the teachers in their respective areas of specialisation would raise the standard of both

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research and teaching programmes of the department. Provision of adequate funds for the purpose should be made. The inadequacy of accommodation has prevented the department for undertaking all the activities. Provision for extension to the existing building would facilitate the process of completion of the task proposed for the Fifth Five Year Plan.

The staff requirement as proposed by the Department during the Fifth Plan would consist of 2 Assistant Professors, 2 post-doctoral fellows, 4 Research Assistants/Field Investigators and one Clerk-cum-Typist as supporting staff. The department should be provided with an expenditure of Rs.15,000/- per year for five years during the Fifth Plan and the extension to the existing accommodation should be of the order of 2000 sq.ft. at a total cost of Rs.one lakh. For development of the laboratory an amount of Rs.1,00,000 has been asked for during the Fifth Plan. A provision of Rs.30,000 during the Fifth Plan would enable the department to procure/ fabricate teaching aids such as, instructional films, reprints of research publications, case studies, audio visual materials etc. and a sum of Rs.25,000 would be required to build up appropriate library facilities in the area of Management of Science and Technology.

Department of Mechanical Engineering

The work of the Mechanical Engineering Department during the Fourth Plan was being carried out in two departments i.e. Department of Internal Combustion Engineering and the Department of Mechanical Engineering. These departments were merged together to form a single department of Mechanical Engineering in 1973. During the Fourth Plan period, research activities in the department covered areas like Heat Transfer Engineering, Foundry Science Engineering, Machine Design, Automatic Control, Combustion Engineering, Vehicle Dynamics, Turbomachinery, Lubrication and Vibration. Design, Development and Testing of Machine Elements, Components, Systems and Instruments constituted a major activity of the department.

Postgraduate courses were organised on direct energy conversion, welding engineering, forging technology, pneumatic and hydraulic control systems.

The staff of the department consisted of 12 Professors, 14 Assistant Professors, 6 Lecturers and 15 Others as on 1.4.1974. The M.E./M.Tech. enrolment in the department rose from 36 in 1966 to 27 in 1974. The major areas of research in the department pertain to (a) Thermal Science and Systems Engineering, (b) Mechanical System Analysis and Design, (c) Internal Combustion Engineering and Turbomachines, (d) Foundry Science and Engineering, (e) Instrumentation and Control. Each of these areas is under the supervision of one or more Professors assisted by other members of the faculty in their respective areas of specialisation.

Twenty-six research scholars have been working for their M.Sc./Ph.D. degree in the department with scholarships/fellowships from agencies like UGC, BARC Bombay and Indian Institute of Science, Bangalore.

Besides guiding research scholars, some of the faculty members have been providing technical assistance in carrying out investigations on Internal Combustion Engineering, Fuels and Combustion, etc. with finances provided by Escorts Limited, Faridabad, Infield India Limited, Madras, Hindustan Motors Limited, Madras Kirloskar Oil Engines Limited, Poona and Hindustan Aeronautics Limited, Bangalore.

Some of the faculty members have been working on specific research schemes such as Internal Combustion Engineering, Vehicle Dynamics, Turbomachines, Wind Tunnel, Turbines, Range Finder, Nuclear Engineering financed by agencies like Ordnance Engineering Limited, Bharat Electronics Limited, Kirloskar Oil Limited, Aeronautics R&D, BARC with provision of funds ranging between Rs.17,000 to Rs.6,20,000 per scheme.

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Some of the members of the Faculty have worked in other institutions in the country and abroad on specific research schemes like Foundry Technology, Foundry Metallurgy, Foundry Science, Combustion Engineering, Heat Transfer, Tribology at institutions like Department of Energy Mines and Resources, Canada, Birmingham University, UK, O.T.C.A. Japan, University of Waterloo, Canada, University of Saskatchawan, University of Karlsruhe, IIT Madras during the period 1965-72.

A small departmental library exists with textbooks, reference books, manuals etc. pertaining to research and teaching activities in mechanical engineering. The central library facilities of books and journals are being utilised by the department. The department runs a small workshop with the help of 6 Mechanics.

The department possesses research equipment and instruments like Single point and multipoint recorders, x-ray radiographic equipment, digital microscopes, industrial spectroscope, furnaces, high vacuum melting unit, polariscopes, Moire equipment, Mach-Zehnder interferometers, wind tunnels, shock tube, water table, vibration equipment, oscilloscopes, strain gauge units, hot wire anemometry unit, transducers and pen records etc.

Besides, other major equipment in the Institute such as Liquid Nitrogen Plant, Stress Freezing Ovens, Polarioscopes, Holography Units, Wind Tunnels etc. are also being utilised by the department.

The department has to its credit fabrication of equipment like Mach Zehnder Interferometers, Low Turbulence Wind Tunnel, Precision Polariscope, Water Table, Viscosity Measuring Equipment, Accelerometer and Pressure pickputs, Altitude Chamber, Combustion Rig, Fuel Injection equipment, Chassis Dynamometer, Periphery Camera, Cascade Tunnel etc.

During the last six years the department organised intensive courses/programmes in Fuel Efficiency, Optical Methods in Stress Analysis, Design Engineering, Foundry Engineering for Polytechnic Teachers. The department is also offering facilities for quality Improvement Programme for teachers from other institutions.

Curricula development, improvement in teaching methods, laboratory development etc. constitute as an important activity of the department.

The department has to its credit 325 publications in scientific journals in India and abroad since 1965.

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The research facilities at Hindustan Aeronautics Limited, National Aeronautical Laboratory and other educational institutions have been made use of by the department in pursuit of its research and teaching. Research workers from Hindustan Aeronautics Limited and other educational institutions have made use of the facilities available in the department.

The department has been experiencing some difficulties in carrying out its research activities due to lack of foreign exchange, reliable Indian equipment, technical assistance for fabrication etc.

During the Fourth Plan positions for 2 Professors, 4 Assistant Professors, 5 Research Assistants/Technical Assistants had been provided all of which have been filled up. The allocation of funds for research in the Department of Mechanical Engineering during the period 1966-67 to 1973-74 under Block and Plan has been as below :

Year	Block	Plan	Total
1966-67	2,26,545	-	2,26,545
1967-68	2,34,349	-	2,34,849
1968-69	2,24,549	-	2,24,549
1969-70	2,13,730	3,717	2,17,447
1970-71	1,87,566	3,504	1,91,070
1971-72	2,10,217	6,000	2,16,217
1972-73	2,38,825	5,839	2,44,664
1973-74	2,51,334	6,166	2,57,500
Total :	17,87,615	25,226	18,12,841

PROPOSED PROGRAMME OF DEVELOPMENT DURING THE FIFTH PLAN

The department has broadly classified its research programmes in the following areas :

Thermal Systems and Engineering
Mechanical Systems Analysis and Design
Turbomachinery and Internal Combustion Engineering
Foundry Science.
Automatic Control.

Department of Metallurgy

The staff strength of the department of Metallurgy consisted of 3 Professors, 7 Assistant Professors, 7 Lecturers and 1 Other. The department offers courses both at undergraduate and postgraduate level. The ME/M.Tech. enrolment as on 1.4.1974 was 20 and 18 students had been registered for undertaking research in the department.

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During the Fourth Plan period much of the effort was directed towards basic research in the areas of (1) Thermodynamic and Kinetic Data by Solid Electrolyte Techniques, (2) Kinetics of Gas Solid Reactions, (3) Calorimetry, (4) Solute - vacancy Interactions and Precipitation Hardening, (5) Dislocation Interactions and Deformations of Metals and Alloys, (6) Electrodeposition of Metals and Alloys, (7) Stress Corrosion and Oxidation of Metals and Alloys, (8) Phase Stability and Transformation (9) Defect Energetics.

A number of applied research projects involving development work were also taken up.

The major areas of research in the department cover (a) Extractive Metallurgy, (b) Mineral beneficiation, (c) Electro Metallurgy and corrosion, (d) Phase stability and Phase transformations, (e) Preparation of Special Materials, their deformation and structure. Each of these areas has been under the supervision of one or more Professors assisted by other members of the faculty in their respective fields of specialisation.

Seventeen research scholars are working in the department with scholarship/fellowship ranging between Rs.250/-to Rs.500/-p.m. awarded by Indian Institute of Science, Bangalore, CSIR, UGC.

Besides guiding research scholars for Ph.D. work, some of the faculty members have taken up two research schemes on (1) Copper manganese alloys for marine propellers, (2) Reclamation of Nickel base alloys from scrap for the Indian Railways with provision of funds of Rs.36,231 (Ministry of Defence) and Rs.31,000/-(Railway Board) respectively.

Some of the members of the staff have worked in other institutions in the country and abroad on specific research projects like, Chemical Metallurgy, Ferrous Metallurgy, Grain boundaries, Electron Microscopy, Creep and deformation, etc. at institutions such as Imperial College, London, Royal College of Technology, Sweden, University of Maryland, USA, McGill University, USA etc. during the period 1967-74.

The central library facilities are being utilised by the department in its teaching and research programmes. The department runs a workshop with the help of 6 Mechanics. The instrumentation and services facilities available at the Institute are being utilised by the department.

Some of the major equipment acquired by the department are : Random house- X-ray unit, Dilatometer, Metallograph, Induction heaters, Hardness testing machines, Torsion testing machine, Impact testing unit, Amsler Universal testing machine, Rotating beam fatigue machine, Rolling Mill, Heat Treatment furnaces, Temperature controllers, Strip chart recorders. Some of the components of these equipments have gone out of order. These components and accessories have to be imported so as to make these equipment serviceable.

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The equipment and other physical facilities available in the Institute's Departments of Aeronautical Engineering, High Voltage Engineering, Central Instruments and Services Laboratory, Physics etc. are being utilised for programmes of teaching and research in the department.

The members of the staff of the department have been able to utilise the research facilities available at the National Aeronautical Laboratory, Bangalore, IIT Madras, BARC, Bombay etc. The facilities available in the Department are being used by other institutions like National Aeronautical Laboratory, Bangalore, IIT Madras (for rolling and wire drawing facilities), S.S.T.C. Thumba, D.M.R.L., Hyderabad (for Electro slag Refining and Thermogravimetric work) and BHU and Karnatak University (for deformation studies and thermogravimetric work).

The department has to its credit fabrication of the following equipment :

a) Electro slag refining unit;
b) Arc Furnace;
c) An oxygen probe for oxygen potential of gas mixtures
d) Thermo Balances and Thermogravimetric units;
e) Variable strain rate tensile and compression testing unit;
f) Damping capacity measurement unit;
g) Bearing Testing rig;
h) Unidirections;
i) Thermag Unit;
j) Constant stress creep testing units;
k) Resistivity set-up.

The department organised three seminars/symposia/summer schools on topics like Prospects of small scale metallurgical industries in India (1971), Defect Interactions in Solids (1972), Industrial Metallurgy (1972), Physico Chemical Principles of Process Metallurgy (1973).

Along with other departments of the Institute, the department of metallurgy also participated in the introduction of Unit System for grading of the students' performance. The department has to its credit 69 publications in scientific journals in India and abroad during the period 1965-73. The department has been experiencing some difficulties in carrying out its research activities due to non-availability of modern research equipment, funds and foreign exchange.

During the Fourth Plan provision of 1 Professor and 2 Assistant Professors had been made and the posts of 1 Professor and 1 Assistant Professor have been filled up. Allocation of funds for research in the Department of Metallurgy during 1966-67 to 1973-74 under Block and Plan

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has been as under :

Year	Block	Plan	Total
	Rs	Rs	Rs
1966-67	96,913	-	96,913
1967-68	1,02,092	-	1,02,092
1968-69	1,11,506	3,999	1,15,505
1969-70	1,00,875	3,939	1,04,864
1970-71	1,09,953	3,989	1,13,947
1971-72	1,12,530	3,994	1,16,524
1972-73	1,20,250	4,005	1,24,255
1973-74	1,19,195	3,805	1,23,000
Total	8,73,319	23,731	8,97,100

Proposed Programme of Development During the Fifth Plan

During the Fifth Plan, the department has proposed that a considerable portion of the basic work will follow as original expansion of programmes initiated during the Fourth Plan period. The department has proposed to place more emphasis on industry oriented development work. The two main areas selected for intensive work are :

1. Materials development; and
2. Mineral beneficiation and extraction.

Research effort in the recent past has been mainly directed towards fundamental studies in the fields of chemical metallurgy (Thermodynamics and kinetics), Physical metallurgy (Defect interactions in solids and precipitation hardening) and certain areas of mechanical metallurgy (dislocation dynamics) in the Fifth Five Year Plan. The academic interest in the above areas will be retained and industry oriented research and development programmes have been proposed to be introduced with major thrust in the area of development of high strength and high temperature materials for use in the aerospace and defence application. The expertise available in the department and the location of aeronautical and other defence organisations in Bangalore and the Space Centre at Thumba warrants this approach. Implementation of this type of R & D Programme would require provision of -

Augmentation of the existing melting, fabrication, testing and diagnostic facilities in the department, for which the following equipment would be needed:

i) Melting facilities

a) Vaccum induction furnace
25 kg capacity Rs. 12 lakhs

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b) Vacuum arc furnace 10 kg capacity — Rs. 7 lakhs

c) High current transformer for FSR — Rs. 2 lakhs

II) Fabrication facilities

a) Hot rolling facilities — Rs. 3 lakhs

b) Cold swaging unit

iii) Testing facilities

a) 25 tons instron Universal testing unit — Rs. 12 lakhs

b) Creep testing machine 1100°C — Rs. 2 lakhs

iv) Diagnostic facilities

a) Powder X-ray diffractometer and accessories — Rs. 6 lakhs

b) Electron migroscope — Rs. 14 lakhs

c) High Temperature metallograph — Rs. 2 lakhs

v) Workshop facilities

a) HMT lathe - 1 — Rs. 70,000

b) Milling machine - 1 — Rs. 1 lakh

Most of the above are standard equipment available in sister Institutions like IIT's and Banaras Hindu University. The research work in the department is seriously hampered by the lack of these facilities.

For the housing of the melting and fabrication units, additional floor area of 10,000 sq.ft. would be required. The department has proposed that this additional floor area may be made available by constructing the first floor above the newly constructed wing in the department.

For the effective implementation of the programmes envisaged in the Fifth Plan, the department has requested for the provision of the following staff :

Professors	3
Assistant Professors	3
Technical Assistants	4
Stenographers	4
Laboratory helpers	3
Mechanics A	2
Mechanics B	2

The facilities thus created would not only be utilised by the department of metallurgy but also meet the requirements of the sister departments of the Institute as well as other institutions and universities in the country.

Technology
Forecasting

Studies on the relevance and applicability of Technology Forecasting to the Indian scene were started during the IV Plan period. The results of these studies provide a basis for selecting R & D projects. Areas under study during the Plan period included chemical industries, energy, population control, steels and food. The Institute has been identified by the NCST as one of the centres for futurology studies.

During the Fifth Plan, besides completing studies pertaining to the above mentioned areas, studies pertaining to other materials, transportation, health sciences have been proposed to be undertaken.

PART-II: RECOMMENDATIONS OF THE V PLAN VISITING COMMITTEE

The Fifth Plan Visiting Committee have had the benefit of presentation from the Director, the four Division Chairmen and the Deans of Faculties on the various aspects of the functioning of the Indian Institute of Science and on the underlying philosophy in the various proposals they have made. They drew attention of the Committee to the recommendations of the Reviewing Committee under the Chairmanship of Professor T.R. Seshadri. The Reviewing Committee recommendations have been accepted by the Government with the direction that the Council may implement them. It became apparent to the Committee that because of the limited funds that are now likely to be available, it would not be possible to fully implement the Reviewing Committee recommendations. The Committee noted, however, that where no funds are involved, action has been taken to implement the Reviewing Committee recommendations in several instances.

The Committee divided itself into four sub-groups and visited the various departments grouped together as four Divisions. The sub-groups reports by and large substantiated the points made in the presentation of the authorities of the Institute and gave in some instances detailed recommendations in regard to the requirements of staff, working expenses, capital equipment and building programmes. In the preparation of this report, the points made by the Institute authorities and the availability of funds were taken into consideration. There was general agreement that notwithstanding the individual sub-group recommendations, within a broad classification of allocations, substantial freedom should be available to the Institute authorities in the expenditure to be incurred, and recruitment of staff. This has become all the more necessary since the funds likely to be available are far less than the original tentative allocations. In view of the pressing requirements against limited funds, the recommendations are given in the form of 1st and 2nd priority. The sum total of the first priority amounts to Rs.452 lakhs and the second priority Rs.198 lakhs. If funds are available, they may be given to implement the recommendations given in the second priority also. The allocations are recommended under the following broad classification: recurring, non-recurring, equipment for central facilities, equipment for departments, buildings for campus development with details of suggested allocations under each head.

The Visiting Committee wishes to highlight the following:

The Indian Institute of Science has contributed enormously to the growth of science and Technology in the country. It has, over the years, supplied substantial manpower to the academic institutions, research laboratories, industry and to some extent to the administrative organs.

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of the Government. The Institute is almost seventy years old. Over the period of years, technological obsolescence has overtaken the Institute's research equipment. Many of the older buildings are in urgent need of substantial repairs.

Maintenance of a high level in teaching and research in Science and Technology cannot be carried on without first-rate equipment and supporting facilities. It would not be possible to do first-rate research even with first-rate staff under such circumsta nces. By any reasonable measure of evaluation, the Institute staff as a group perahps represent some of the best scientific talent in the country. Therefore, removal of technological obsolescence in the Institute's research facilities; provision of some new buildings and renovation of the old buildings, deserve to receive the highest priority in the utilisation of funds that are now proposed to be given to the Institute during the Fifth Plan period.

In view of the extent of technological obsolescence and the state of dilapidation of the older buildings and in view of the limited funds that are now likely to be available to the Institute, it has become clear that the inadequacy cannot be removed during the Fifth Five Year Plan period itself and that this task has to be taken up in stages. This problem becomes even more critical because we were informed that the funds likely to be made available to the Institute are reduced from the initially indicated Rs.6.5 crores to about Rs.4.5 crores. It is this reduction that has prompted us to indicate allocations under the first and second priority. It is, however, hoped that during the course of the plan period, ways and means may be found to accommodate Rs.2 crores that is now proposed to be reduced from the allocations to the Institute. In making its recommendations and defining priorities, the Committee has borne in mind the above perspectives.

The Committee recalls the recommendations of the Reviewing Committee which has stressed the importance of restoring balance between the emphasis laid on the development of research in the Divisions dealing with science and what has been given to the development of research in engineering at the Institute, so that the relative neglect of research in the basic sciences, which has prevailed for sometime is eliminated. It notes that re-emphasis is needed, not as an end in itself but because developments in modern technologies are very strongly influenced by researches in sciences. Provision of sophisticated and modern scientific equipment offers powerful tools for interaction of the science departments of the Institute with engineering departments and influence the growth of science-based technological research in the Institute. It is also expected that in this process, Science Departments will, over the years, shift the emphasis from pure to

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applied scientific research in the Institute. The Committee, therefore, recommends that as far as possible, emphasis may be given to obtaining sophisticated scientific equipment which will be equally useful for both science and engineering departments of the Institute.

The question of additional accommodation and renovation of buildings has also been examined by the Committee. As mentioned already, the buildings housing the older departments are in urgent need of substantial repairs. There is the possibility of renovation and also obtaining additional accommodation by providing one more floor in some parts of these buildings. Such a programme will provide a measure of modernisation of the existing facilities. This renovation is recommended for the Biochemistry Department, Inorganic and Physical Chemistry Department and the Physics Department including Stores in that order. The Committee recommends that a sum of Rs.20 lakhs may be provided for this task on a first priority basis with an additional Rs.20 lakhs in a second priority.

In addition, a few new buildings are urgently needed by the Institute. The Reviewing Committee recommended provision of a Central Laboratory Complex to house research in materials science and electronics. In view of the limitation on funds, it would not be obviously possible to provide the whole amount during the fifth five-year plan period itself. The Committee recommends that Rs.30 lakhs may be made available during the current plan period itself with an addition-al Rs.30 lakhs being made available on second priority.

The Committee strongly recommends provision of new buildings for research in Molecular Biophysics which has had a good start. Provision of Rs.8 lakhs is recommended for this building during the current plan period under first priority with another Rs.4 lakhs on second priority.

There is need for additional hostel facilities for accommodating more students for regular courses as well as for continuing education. This is a high priority requirement and we recommend a sum of Rs.15 lakhs during the current plan period. The Campus development which includes completion of the periphery wall and augmentation of the water and power supply facilities (of which a major portion will be needed for renovating power wiring in the departments) will require a sum of Rs.11 lakhs during the current plan period and about Rs.5 lakhs on second priority basis. We also recommend a sum of Rs.5 lakhs for student amenities to provide for some essential needs in the Gymkhana. Accommodation for staff is getting to be a serious problem for the Institute. We recommend on a second priority a sum of Rs.17 lakhs for building quarters for the staff. We note that the spill-over from the fourth plan is Rs.19 lakhs.

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Details of provision under buildings and campus development

		I Priority	II Priority
		(figures in lakhs of rupees)	
I.	Spill-over from IV Plan projects	19.00	-
II.	For new projects as detailed below:		
(a)	Renovation of old Buildings: Biochemistry, Inorganic & Physical Chemistry, Physics including stores	20.00	20.00
(b)	New Buildings:		
	Central Laboratory Complex for materials and electronics	30.00	30.00
	Molecular Biophysics	8.00	4.00
	Hostel facilities for students and continuing education.	15.00	-
(c)	Campus development:		
	Completion of periphery wall and augmentation of water and power supply facilities.	11.00	5.00
(d)	Student amenities	5.00	-
(e)	Additions to staff housing	-	17.00
	Total:	89.00	76.00

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Details of provisions under equipment as Centralised Facilities

For reasons already given, the Committee considers it of highest importance to give priority to these facilities. It notes that during the Fourth Plan period itself commitments had already been made to the extent of Rs.106.00 lakhs as detailed below:

	Figures in lakhs of Rs.
1. Computer expansion which is completed	22.00
2. Computer expansion II phase (under process)	25.00
3. Cryogenic facilities	20.00
4. Single crystal X-ray diffractometer	14.00
5. Hybrid computer	25.00
	106.00 lakhs

These above commitments are clearly the first charge on the provision during the current plan period.

The Institute authorities stressed the importance of additions to the library and graphic art facilities including reprography etc. Attention of the Visiting Committee was drawn by the students of the Institute to the necessity to provide multiple copies of books in the library to assist them. The Committee notes that the Institute is operating the library taking into account the library facilities available elsewhere in Bangalore, as for example, at the National Aeronautical Laboratory. The Committee considers that the proposals of the Institute as modest and approves an investment of Rs.12.00 lakhs in the library on first priority and Rs.3.00 lakhs on second priority and Rs.1.00 lakh on first priority and Rs.2.00 lakhs on second priority for Graphic Arts facilities. The Committee recommends a sum of Rs.5.00 lakhs on first priority and Rs.1.00 lakh on second priority for Instrumentation projects.

The Committee recommends a sum of Rs.25.00 lakhs for augmentation of Central facilities by way of general research equipment on first priority and another Rs.25 lakhs

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on second priority. The Committee wishes to stress the importance of having fully trained technicians rendering services on these centralised facilities but users' committees may be set up for deciding policy of utilisation. The Committee notes that where an expensive facility is required by one department to a much greater extent than the other departments, there may not be any objection in locating such a facility in that department provided a users' committee would be still responsible for the mode of utilisation of the facility. It is conceived, in such a scheme, the technicians operating the facilities will be responsible functionally to a central authority, perhaps through the users' committee.

The Committee has noted with interest the strong emphasis laid down by the Reviewing Committee on the inter-disciplinary programmes proposed by the Institute. These are in the fields of materials science and electronics, molecular biology, bio-engineering and coordinated mechanics. During the last four years, since the Reviewing Committee submitted its recommendations, there have been developments in materials science relating to electronics at the Institute. The Committee recommends an investment of Rs.25 lakhs on 1st priority and Rs.15 lakhs on IInd priority for Materials Science. The centralised facilities now proposed for the electronics and materials science and general research equipment should go a long way in increasing the tempo of research in inter-disciplinary fields of materials science and electronics. The Committee notes the continued interest in the Institute of Molecular Biology, Bio-Engineering and Coordinated Mechanics. The Committee recommends a sum of Rs.2 lakhs for Molecular Biology and Bio-Engineering on first priority and an additional Rs.3 lakhs on second priority. The Committee notes the efforts of the Institute to coordinate the research in the Coordinated Mechanics programme in the various departments of the Institute. It therefore recommends a sum of Rs.2 lakhs for the Coordinated Mechanics Programme on second priority.

The Committee wishes to re-emphasise the need for modernising the workshop facilities of the Institute. They are run-down and are no longer capable of producing accurate scientific equipment for research purposes. Availability of highly accurate machine tools for fabricating scientific equipment becomes even more important in view of the difficulty of obtaining foreign exchange for purchasing such equipment. The Committee, therefore, fully supports the recommendation of the Reviewing Committee that the Institute's workshop facilities be modernised. The Committee recommends that these be considered as a part of the centralised facilities of the Institute, equally accessible to all departments for fabrication of equipment. The Committee also recommends the creation of a small Central Design Office which can interact with the Faculty in preparing working

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drawings for the various equipment that are to be fabricated in the workshop. The Committee recommends an outlay of Rs.20 lakhs as first priority and another Rs.20 lakhs on second priority for the workshop and attached Central Design Office.

The Institute authorities drew the attention of the Reviewing Committee, as well as the present Visiting Committee to the lack of adequate inventory of materials required for research and teaching out of which the staff could draw their needs from time to time. This lack of sufficient inventory has a highly deleterious effect in two ways. It takes too long a time to receive materials from the time the materials are ordered and thus delay research progress and secondly inflation seem to cut into the resources rather heavily. The Committee, therefore, strongly recommends the allocation of a sum of Rs.3 lakhs for Inventory build up in the Central Stores on first priority, and another Rs.6 lakhs on second priority.

Summary of the provisions recommended above under equipment for Central Facilities is as follows. This exclud the commitments already made during the Fourth Plan period:

	I phase	II Phase
	(Rupees in lakhs)	
1. Library (Books & equipment)	12.00	3.00
2. Instrumentation Projects	5.00	1.00
3. General research equipment	25.00	25.00
4. Solid State Electronics and Materials Science Programme	25.00	15.00
5. Workshop facilities	20.00	20.00
6. Graphic Arts facilities	1.00	2.00
7. Molecular Biology and Bio-Engineering	2.00	3.00
8. Coordinated Mechanics programme	-	2.00
9. Central stores (inventory build up)	3.00	6.00
	93.00	77.00

DETAILS OF PROVISION UNDER EQUIPMENT FOR DEPARTMENTS AND SECTIONS

The general view of the Committee members who constituted themselves as sub-groups to review the requirements

of the various Departments was that substantial additional facilities are required by almost all the Departments to remove the obsolescence that has set in, in the research equipment. As stated already the sum total of their recommendations turned out to be far in excess of the funds likely to be available during the Plan period after making provision for the central facilities as indicated above.

The Committee recommends a provision of Rs.80 lakhs on first priority for equipment for departments and sections and another Rs.36 lakhs under second priority as follows:

	I Priority (Rupees in lakhs)	II Priority
1. Division of Physics and Mathematical Sciences:		
1.1 Applied Mathematics	0.50	0.50
1.2 Central Instruments & Services Laboratory	2.0	1.00
1.3 Centre for Theoretical Studies	0.50	-
1.4 Foreign Language Section	0.50	0.50
1.5 Physics	2.50	2.00
	6.00	4.00
. Division of Chemical and Biological Sciences		
2.1 Biochemistry	3.00	-
2.2 Inorganic and Physical Chemistry	3.00	2.00
2.3 Microbiology & Cell Biology Laboratory	1.50	1.00
2.4 Molecular Biophysics Unit	8.00	-
2.5 Organic Chemistry	2.00	1.00
2.6 Central Animal Facility	0.50	-
	18.00	4.00
. Division of Electrical Sciences		
3.1 Electrical Communication Engg.	5.00	5.00

3.2 Electrical Engineering	5.00	3.00
3.3 High Voltage Engineering	5.00	3.00
3.4 School of Automation	9.00	1.00
	24.00	12.00
4. Division of Mechanical Sciences		
4.1 Aeronautical Engineering	5.00	5.00
4.2 Chemical Engineering	5.00	3.00
4.3 Civil Engineering	5.00	3.00
4.4 Industrial Management	1.00	-
4.5 Mechanical Engineering	7.00	3.00
4.6 Metallurgy	8.00	2.00
	31.00	16.00
5. Health Centre	1.00	-
Total:	80.00	36.00

DETAILS OF PROVISION UNDER RECURRING

As per the information provided by the Institute Authorities, there is a spill-over of Rs.20 lakhs from the Fourth Plan period as actual expenditure but reimbursed by U.G.C. after that period. This is apparently to be considered as the first charge on the Fifth Plan provisions. In the Centre for Electronics Design Technology and Molecular Biophysics Unit, there is a committed expenditure of Rs.10 lakhs and Rs.2.lakhs respectively. The Committee recommends this expenditure. The Committee also recommends an expenditure of Rs.5 lakhs as working expenses for inter-disciplinary projects on first priority, Rs.one lakh on second priority. The Committee recommends a sum of Rs.10 lakh in first priority and another Rs.5 lakhs under second priority as additional working expenses to operate the centralised facilities.

The Committee notes that the Institute is reasonably well provided with Faculty, although some lacunae was observed in some of the departments. We have recommended elsewhere that additional emphasis be given to applied sciences and to developing higher levels of inter-

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action between science and engineering departments. This may require recruitment of some additional staff selectively. The Reviewing Committee had recommended that the Department of Industrial Management may take initiative to increasingly orient its activities towards R&D management. The Committee feels that studies related/investment decision, such as choice of technology, scale of operations, choice of location, project management, etc. should also become an important part of such endeavour and recommends recruitment of two or three additional staff to assist the Department of Industrial Management to reorient its current activities and give courses to the/graduating in engineering and technology.

The Committee recommends a sum of Rs.12 lakhs in first priority and Rs.3 lakhs in second priority during the Plan period for filling up of essential posts and a sum of Rs.6 lakhs for continuing education on first priority.

Thus, the provisions under recurring are as follows:

	I Priority	II Priority
	(Figures in lakhs of rupees)	
1. Spill-over from IV Plan projects	20.00	-
2. Centre for Electronics Design Technology	10.00	-
3. Molecular Biophysics Unit	2.00	-
4. Working expenses for inter-disciplinary projects	5.00	1.00
5. Additional working expenses	10.00	5.00
6. Provision for essential posts	12.00	3.00
7. Support for continuing education	6.00	-
	65.00	9.00

DIVISION OF PHYSICAL AND MATHEMATICAL SCIENCES

The Division of Physical and Mathematical Sciences, has as its Departments, Applied Mathematics, Central Instruments and Services Laboratory, Computer Centre, Centre for Theoretical Studies, Foreign Languages section and Physics. The Division has as its main research activities, fundamental and applied work in Mathematical and Physical sciences. The Committee has noted with satisfaction the innovation of this Division in the M.Tech. programme in Physical Engineering which seems to have filled an important need in the country.

1. Department of Physics

The Physics Department has a history of pioneering research activities. At present the research work and other academic activities are being maintained at a very high level. The previous tradition of research groups fabricating their own experimental set-up is being maintained. The staff structure had been sanctioned at a time when the Physics Department was mainly involved in research activities in 3 or 4 areas of Physics with 24 research fellows at a time. The department, at present, consists of 10 members of academic staff. Because several staff members have to their credit a record of continuous contribution of high academic standards in their respective fields their work has been recognised and in course of time many have been promoted to the Professorial level. The staff structure, as at present, is 8 Professors, 2 Assistant Professors and no Lecturer. At present the activities of the department have been extended to include courses for M.Tech classes for which Project work is compulsory. The M.Tech programme is in the nature of : (1) dissertation emanating from an experimental programme of work (project work); (2) certain amount of development of techniques and the design and fabrication of advanced experimental set-ups such as High magnetic field equipment, high pressure, low temperature set-up, Heissenberg research equipment etc., (3) participation in projects financed by agencies such as CSIR, Space, DST, Defence etc. in the areas where they have developed expertise (such as semiconductor, electronics, laser application, high pressure phenomena, etc.).

2. Department of Applied Mathematics

The department started functioning in the Institute from March 1956 and has grown into a leading centre of Applied Mathematics in the country. Its contributions in Fluid and Continuum Mechanics, Plasma Physics, Non-linear Waves and Magneto-Hydro-Dynamics have been considerable. The department teaches courses to B.E. and M.E. students and since 1974 has been giving advanced level courses for the training of its own students registered for the Ph.D. degree. About 40 courses are taught by the department during the academic session and about 1100 students attend these courses every year.

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During the Fifth Plan period, besides strengthening the existing activities, the department wishes to develop further in areas such as (a) Computer Science, (b) Mathematical Physics, (c) Probability Theory and (d) Stochastic Processes. It is also proposed to start a two-year advanced course in Mathematics in collaboration with TIFR Bombay to train high calibre mathematicians for Application of Mathematics in Physical and Engineering Sciences.

The research activities have been classified into four coherent groups (a) Fluid and Continuum Mechanics, (b) Mathematical and Plasma Physics, (c) Analysis and (d) Computer and Management Sciences.

(a) Fluid & Continuum Mechanics

The group has a total strength of about 10 academic staff (1 Associate Professor and the remaining at the level of Assistant Professor and Lecturer) and it has emerged as a strong stable group. The members have been very active in research (about 100 research papers have been published in journals of international repute during the last five years and 18 candidates have been awarded the Ph.D. degree in this period). However, taking note of the recommendations of the last Reviewing Committee in respect of developing interaction with the departments of Physics, Aeronautical Engineering, Computer Centre etc., we have observed that except for isolated instances there is very little active collaboration with other departments in research. With a large reservoir of talents available in this group and newly emerging interdisciplinary activities like Bio-Engineering, Meteorological applications etc. being developed in the institute, the Committee hopes that more meaningful interaction would take place and that collaboration in the investigation of real life problems would develop between other groups and departments and the faculty members and the research scholars in this group. Inspite of its being one of the best applied mathematics team available here, the scientific talents and resources have not been channelised in appropriate directions due to lack of dynamic leadership in the Group. Creation of one post of Professor for this Group has become an urgent need.

(b) Mathematical and Plasma Physics

Activities in Plasma Physics have been going on for quite a good number of years. With the addition of a Professor in Mathematical Physics, a new thrust has been given to activities in the area of theoretical Physics especially Quantum Mechanics. At present, while the mathematical physics group has one Professor, in Plasma Physics they have one Assistant Professor and one Sr. Research Officer. The Institute has suggested the addition of faculty position to the mathematical physics group and one to the plasma physics group. So far as the mathematical physics group is concerned, there is a fairly good amount of interaction

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with various groups and departments and there is enough justification to increase the strength of this group by one more faculty member. However, in the case of Plasma Physics, adequate expertise already exists in the Fluid and Continuum Mechanics group, some of whom could be utilised to take up more relevant problems which are proposed to be developed in future in Plasma Physics. Since another active group in this area is emerging in the Electrical Sciences Division, a strong interaction should take place between the Plasma Physics group in the Mathematics department and the Electrical Sciences Division. In view of this, adequate justification does not appear to exist for adding one more faculty member immediately to the Plasma Physics group. One lecturer's position however should be made available to the Mathematical Physics Group under Priority I and one faculty position at Lecturer's level under second priority to Plasma Physics Group.

(c) Analysis

This group has two faculty members: one Professor and one Assistant Professor. They are fairly active and they want one more added to their faculty strength. The addition of one Lecturer to this Group under second priority is recommended.

(d) Computer Science and Numerical Analysis

This group has two faculty members including one Professor. They have considerable amount of interaction with the faculty of the Centre of Theoretical Physics, Computer Centre and School of Automation. Although they have not asked for any additional staff, the committee feels that it would be useful to have a computer oriented numerical analyst in this group who could be of considerable help in future research activities which promise to expand rapidly having regard to the type of problems which various groups would take up in meteorological area, Bio-mechanics etc. Under second priority, there may be an addition of one lecturer in the area of Computer Oriented Numerical Analysis.

The department of Applied Mathematics has asked for an increase in the working expenses because of increased activities over the past years. It is felt that an yearly increase of about Rs. 25,000/- may be recommended under first priority for the department of Applied Mathematics. A grant of Rs. one lakh for the purchase of equipment like Micro Computer, Electronic Scanning Machine, Electronic Calculators etc. which was recommended by the Reviewing Committee and has also been approved by the Institute, should be sanctioned to the department under first priority.

Only 12 research scholars have been allocated to the department and quite a good number of faculty members are without research scholars. It is, therefore, strongly felt that 12 more research scholars may be added to the department.

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UGC has started its new scheme of training teachers under Faculty Improvement Programme (FIP) and the department can play a very important role at national level in helping the UGC in this respect. At least five university/college teachers be selected every year under the UGC scheme for this purpose.

3. Centre for Theoretical Studies

The Centre for Theoretical Studies is a very interesting academic experiment. It provides freedom to study entirely new and unconventional subjects from new angles and promotes a forum for discussion among scientists from different disciplines on a particular problem. The Centre has already organised several meetings on unsolved problems of Physics, Statistical Physics and Meteorology and has been inviting several distinguished scientists and young workers to spend some time at the Institute. The Committee feels that the growth of the Centre for Theoretical Studies is important for maintaining the Institute on the frontline of scientific activity. It is suggested that this kind of intellectual venture should be supported by the U.G.C. as a special programme with additional funding for recruitment of staff etc. as the industry and other R & D organisations are not likely to support such highly forward looking and important scientific research.

4. Central Instruments and Services Laboratory

The Institute authorities may wish to review the position of the Central Instruments and Services Laboratory as a department in the Division of Physical and Mathematical Sciences. When the Central Laboratory complex comes into existence, this department will presumably have an important role to play as a part of that complex since it can become the focal point for the development of that Complex. It would then be somewhat of an anomalous situation to associate it with one of the existing Divisions of the Institute. An important problem which the Institute also will have to resolve is in regard to the nature of the research activities that are proposed to be taken up by this department. While development of equipment for research, and the hard work oriented research leading towards them can and should clearly be the responsibility of this Department, commercial utilisation of the equipments developed may not be the responsibility of this department. It is suggested that the Institute authorities may carefully review this problem and the future functioning of the department.

The Central Instruments & Services Laboratory has three distinct activities :

1. to acquire highly sophisticated instruments as a central facility and supply highly accurate data to the entire Institute;

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2. to service instruments for the entire Institute;

3. the development of techniques, devices and complete instruments.

At present they have a cadre of staff

1. for maintaining highly sophisticated instrument at proper level of functioning and supplying accurate data using these instruments;

2. for servicing instruments and producing optical and thin film devices.

They also have an electronics group which can satisfactorily design and develop to the production level electronics instruments which are likely to form viable industrial products. They have successfully taken part in rigging up sophisticated experimental arrangements requiring considerable amount of optics, such as Mack Zender Interferometer, Holographic arrangements etc.

The staff structure had been sanctioned in 1965 when the laboratory was just taking off. The total number of staff members sanctioned were 8. At present, the distribution of the position is 1 Professor, 4 Sr. Scientific Officers (Reader's grade) and 3 Scientific Officers (Lecturer's grade).

Their activities upto this time have been carried out by temporary staff appointed under the various projects including the UGC project and by interacting with various disciplines of the Institute.

The activities of the CISL at present, have been staffed for work mainly on fabrication of equipment. The Division has pointed out the necessity of some positions of academic staff at the levels of Lecturers and Readers rather than the technical staff like Sr. Scientific Officer and Scientific Officer.

During the last ten years, the CISL has developed extremely good facilities and potential for design of new instruments, equipment and laboratory set-up for advanced research work in the following very important areas of modern science.

a) Laser Physics
b) High Vacuum Physics
c) Thin Films
d) Applied Optics

The type of facilities that are available now could attract highly competent scientists in this area. The Institute may take advantage of this position by forming research groups in these newer areas of physics and creating a nuclei for carrying out advanced research in them. At present

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neither the Physics Department nor any other department in the Institute is working in these modern areas. It is necessary, therefore, that some 4 Positions of Readers and 4 positions of Lecturers be created to start nuclei of research groups in the above areas for which adequate facilities have been created at the Institute. The exact placement of these research groups either in the Physics department or in the CISL may be left to the discreation of the Director.

5. Foreign Languages Section

The Foreign Language Section is essentially a service department for teaching German, French and Russian. They also train science graduates in the use of English. They have some research activity and they are housed in a part of the library. They require a language laboratory and some space for their activity.

It is a well recognised fact that the exchange of faculty between various institutions engaged in frontier level research can be helpful to the faculty as a whole in generating new ideas and defining new lines of approach to the problems under investigation. Faculty participation in relevant national and international conferences is also important for achieving these objectives. In order to encourage this activity, travel fund and financial support for meeting other unavoidable expenses have to be provided. We understand that there is serious constraint on the availability of funds for these purposes. We therefore urge that this aspect of higher education and research be given a due weight.

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DIVISION OF CHEMICAL AND BIOLOGICAL SCIENCES

The Division consists of the Departments of Biochemistry, Inorganic and Physical Chemistry, Microbiology and Cell Biology, Molecular Biophysics, Central Animal Facility and the Organic Chemistry. The Committee met the Heads of the Departments, senior faculty members and other faculty and research scholars to discuss the problems facing the Division to understand the major thrusts that these departments are making and would continue to make in the next five year Plan. The Committee was impressed with the very good work being done by the faculty and research scholars despite serious handicaps in regard to facilities and space.

The Division has major research interests in the synthesis and preparation of compounds, crystal and molecular structure, reaction mechanisms and bilogical metabolism. It has also developed links with the groups on materials science, molecular biology and bio-engineering.

1. Department of Biochemistry

It is a credit to the Division that the Department of Bio-chemistry has been recognised as a Centre of Advanced Study by the UGC. The Committee agrees with the proposals of the Institute authorities to continue with the existing programmes with special emphasis on lipids and biomembranes, proteins and enzyme mechanism, molecular and cellular biology, endocrinology, antibiotics. The department has made great strides in Hormone research, lipids, molecular biology, environmental bio-chemistry and plant bio-chemistry. The department has been implementing number of consultancy projects with finance provided by industry and outside agencies. The department has collaborative research projects with other departments in the Institute such as Molecular biology and bio-engineering.

The building where the department is now located has out-lived its life and it is in immediate need of extensive renovation, extention etc. Lack of foreign exchange and inadequate provision of adequate maintenance grant in the past have hampered the progress of the department in its various research pursuits. The Committee is convinced that for keeping up the tradition of the department, it is essential that timely provision of a small sum of foreign exchange support as well as adequate increase in the maintenance grant to the department for meeting running expenses are made available, particularly in view of the high rate of increase in the running expenses and the urgent need for keeping sophisticated equipments operative by providing sufficient spares, accessories etc. The working ~~expenses now being incurred in the departments of the Division~~ average around Rs.700 to Rs.800 per year/worker. This is totally inadequate. The department has been able to turn out outstanding work because the hard work and outstanding contribution of the faculty members have attracted schemes and consultancy

/financial work resulting in additional/inputs. The dependence on uncertain financial inputs by outside agencies does not ensure a smooth and planned process of development. Many of the equipments and other physical facilities in the laboratories are more than 10 - 15 years old and have become more or less obsolete. Adequate provision of funds for equipping the laboratories on modern lines is an urgent necessity and the committee is happy to note that the Institute authorities have made adequate provision of sophisticated equipments to be housed as a central facility for use by individual departments on the basis of some agreed time-table. The Committee is, however, of the view that some of the equipments which are used frequently by a particular department could be housed in the individual department ensuring that this equipment are available for use by other sister departments as and when needed. The Institute will certainly include the sophisticated equipments, such as, refrigerated centrifuge, ultra centrifuge etc. which are very often needed by the Department of Biochemistry or by the Department of Microbiology and Cell Biology as centralised facilities with provision of adequate foreign exchange for procuring the spares and accessories and for their maintenance.

The Department appears to be adequately staffed. If any additional faculty position was needed, on the basis of any special development in its research pursuits during the current Plan period, the Institute should be in a position to make provision for the same out of the total bulk Recurring grant recommended under the Fifth Plan. This will be true not only for additional staff position in the Department of Biochemistry but also for the other departments of this Division and departments in other Divisions of the Institute.

2. <u>Department of Inorganic & Physical Chemistry</u>

The Committee has noted with interest the extensive activities of the Department of Inorganic and Physical Chemsitry and the re-orientation of the programmes to have strong bearing on Materials Science programme of the Institute, particularly in regard to Inorganic and Mineral Chemistry, Electro-Chemistry, Molecular Structure, Polymer Chemistry and High Energy Solids. Like the Department of Bio-chemistry, the Department of Inorganic and Physical Chemistry is also handicapped in regard to laboratories and space. The existing laboratories, which are old, need extensive renovation and extension. The Committee has proposed a general non-Recurring provision of Rs. 20 lakhs for renovation and extension of the existing Departments of Bio-chemistry, Inorganic and Physical Chemistry, Physics including Stores. The provision for equipment has been indicated in the tabular form along with other departments attached to the Report. The Committee has noted with interest the plans of the department to participate in programmes for the improvement of education in Chemistry in University and colleges. This activity, the committee feels, will fit in with the UGC Scheme of Faculty Improvement Programmes. The Committee is convinced that the

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Institute with its developed expertise and facilities will make a major contribution in this regard. The Department will need the addition of two more faculty positions during the Fifth Plan period and the committee recommends in the first priority the provision of 2 Assistant Professors, one in Flourine Chemistry and the other in Explosives.

3. Department of Microbiology and Cell Biology

The Committee has noted the closure of the conventional work in Pharmacology and the proposals to intensify activities in the areaof Cell Biology, Molecular Biology and Genetics and Bacterial Metabolism. The department has done extremely significant work in the field of Microbial Metabolism and Genetics, Animal and Plant Tissue Culture, other aspects of Cell Biology and Immunology. The Committee has noted with satisfaction that this department has successfully conducted two courses on Bacterial Physiology and Genetics of Bacteria. A similar course on Tissue Culture is expected to be conducted in 1976-77.

The urgent need of the department pertains to renovation and extension of the Central Animal Facilities. The Committee recognises this urgency and agrees to provide the facilities under first priority. This has been indicated in the Non-Recurring provision for all departments (Rs.50 lakhs under first priority and Rs.0.50 lakh under the second priority). The Animal House Facility will need services of Laboratory Assistants/ Attendents, provision for which has been indicated against the Central Animal House Facility.

The Microbiology and Cell Biology department to be really effective would need the provision of additional faculty positions such as, 1 Assistant Professor in Immunology and Scientific Officers in Tissue Culture and Genetics. The Institute, it is hoped, will consider the provision of these faculty positions sympathetically, out of the overall recurring allocation suggested in the Report.

4. Molecular Biophysics Unit

The Committee has noted with considerable interest and satisfaction the functioning of the Molecular Biophysics Unit of the Institute, which was started in 1971, and fully supports the Plan of the Unit to intensify its activities in Biopolymer Conformation, X-ray Crystallography and NMR studies, three-dimensional reconstruction and conversion of Cellulosic waste material into protein. The Unit has been running a post-M.Sc. course of one year for the award of the diploma of the Institute. The first course has been completed. The most acute problem of the Unit is lack of accommodation of its own which has created problems in its proper functioning. The staff, at present, are partly located in the Lecture Hall Complex and partly distributed in the old Organic Chemistry Building and in the Department of Bio-Chemistry. This is far from satisfactory for ensuring a

coordinated functioning of the department. The first and foremost requirement of the Unit is, therefore, a building of its own. The Committee has, therefore, recommended the provision of a suitable/ for housing the Molecular Biophysics Unit as indicated in the statement for buildings.

/building

The department has been engaged in pioneering work of a very high order and therefore needs special encouragement to pursue its objectives. The Committee has therefore recommended adequate provision of equipment and other physical facilities. As regards requirement of staff, the committee feels that it will be more appropriate if freedom is given to the Institute to procure the services of additional faculty members as may be decided on the basis of nature of work undertaken and also on the basis of availability of personnel in specified fields of specialisation. The Committee is certain that the Institute authorities will provide the necessary faculty positions out of the overall allocation for Recurring Expenditure.

5. Department of Organic Chemistry

. . . . . The Committee has noted the proposals of the Organic Chemistry Department to initiate new lines of work in the fields of Photochemistry, Organometallic Chemistry, Organic Chemical Geochemistry and Organic Chemistry of Agricultural chemicals. The four existing major activities of the department pertain to Synthetic Organic Chemistry, Physical Organic Chemistry, Structure determination including X-ray Crystallography and Bio-organic Chemistry. Certain activities in inter-disciplinary areas such as molecular biology and medicinal chemistry etc. are also under way. The department has interacted closely with organic chemcial industries and has offered technical help and consultancy. Some new work in Organo Metallics, Photochemistry and Chemistry of fungal Metabolites has been initiated. Like all other departments of the Institute, the Department has also suffered from inadequate provision for running expenses. The Committee feels that with the provision of additional inputs under maintenance, some of the problems of all these departments would be solved. The provision of equipment (for gradually replacing the outdated existing equipments and addition of new sophisticated ones) would be met out of the provision for equipment as indicated under Non-Recurring statement for all the departments.

The Department needs additional faculty positions for its efficient functioning. The Committee has, therefore, recommended the creation of four Lecturers and four Scientific/ Technical Assistants. The area of specialisation of the Lecturers/Technical Assistants may be left to the discreation of the department/Institute.

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6. Department of Central Animal Facility

The augmentation of the Central Animal Facility has become imperative in view of the important work being carried out in the Departments of Bio-Chemistry, Microbiology and Cell Biology etc. and the committee has therefore, recommend provision of an input of Rs.50,000/- under Ist priority and Rs.50,000/- under second priority towards additional central animal facilities. The Committee feels that for the efficient running of the central animal facilties, the Institute will need the services of senior laboratory attendant, senior and junior anumal house attendants. The Committee hopes that the Institute authorities will provide this facility out of the overall grant recommended under Recurring.

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DIVISION OF ELECTRICAL SCIENCES

The Electrical Sciences Division has as its Departments, Electrical Communication Engineering, Electrical Engineering, High Voltage Engineering and School of Automation. The Committee is happy to note this re-organisation and feels that this is a very desirable way of coordinating the teaching and research in this closely related areas. This approach should result in better resources utilisation, avoidance of redundancy in teaching effort and in eliminating overlapping equipment needs. It is expected that in the near future the gains will become visible because of the coherent and close interactive approach amongst the Faculties of the Division resulting in better teaching and research outputs.

The Committee has been highly impressed by the commitment of the School of Automation in giving an industrial orientation to their programme with a view to making their teaching and research relevant from the national angle. Even as a young department it has started attracting significant projects from outside agencies.

All the four departments are involved in R&D projects sponsored both by the Government and Industry. This involvement has resulted in Ph.D. and research programmes of great relevance and high quality. The involvement of the Electrical Engineering Department with the specific projects in the areas of Industrial Drives and Controls is particularly noteworthy. Most of the equipment in the Electrical Communication Engineering department has become out-dated; there have been no major inputs, since the inception of the postgraduate programmes in the department in 1957. It is therefore imperative to provide adequate equipments to this department so as to up-date some of the existing laboratories and to provide facilities for experiments in certain areas where they do not exist at present. Further, there is strong need to provide back-up technical staff to ensure the proper upkeep of the laboratories and to support project work.

A greater stress needs to be given to the modern aspects of communication. It will be desirable to start a programme in Space Communication for which involvement with ISRO may be sought.

It will be desirable that the work being carried out in the Controls Area in the Electrical Engineering department be co-ordinated more closely with that in the School of Automation. The possibility of working on joint projects in Stability Area with the Aeronautics department is worth exploring.

In keeping with the objectives of grouping related departments into a Division, it is suggested that the Division reviews its M.E. programmes so as to evolve common courses wherever possible, thereby relieving some of the teaching efforts on the part of the faculty.

Further, in line with the philosophy of forming research groups a fresh look may be taken at the reorganisation and re-grouping of laboratories across the Divisions so as to avoid duplication of equipment and organisational effort.

Three separate groups are engaged in the development of Solid State Electronic Devices. Since a strong Central facility for development of materials for electronics and semi-conductor devices is being set-up during this Plan period, it is strongly felt that these activities should come under the aegis of this Central facility.

It has been observed that on account of many posts remaing vacant imbalances have arisen in teaching and research loads of the faculty. This is particularly true of the faculty in Power Systems and Power Electronics areas. It is in these areas that many outside agencies are approaching the Institute for assistance in solving problems of national importance, like reduction of Power System losses and economic system operations. The Institute should make concerted efforts in filling up the vacant posts in these areas.

The Committee noted the proposals of the Institute to expand the IBM 360/44 computer system and the proposal for acquiring a larger computer configuration. There is no doubt that access to a large computer is essential for effective functioning of the Institute.

The Committee has recommended a provision of Rs.12 lakhs and Rs.3 lakhs under first and second priorities for creation of posts. The Institute may like to create some additional faculty positions in the Division of Electrical Sciences within this total provision.

DIVISION OF MECHANICAL SCIENCES

The Committee has with satisfaction the useful role played by the various Departments which form the Mechanical Sciences Division. These are, Aeronautical Engineering, Chemical Engineering, Civil Engineering, Industrial Management, Mechanical Engineering and Metallurgy. The Committee feels there is much more that can be done by the Division to satisfy the country's immediate and future requirements through sponsored research and consultancy.

1. Department of Aeronautical Engineering

The Committee is aware of the proposals of the aircraft industry to produce aircraft indigenously. In this regard, the Aeronautical Engineering Department has an important role to play in training competent design engineers. The Committee has noted with satisfaction the association of the Department with HAL in the Design Training Programme.

The work done by the groups concerned with rockets and missiles, structures and Aerodynamics in the department of Aeronautical Engineering has been commendable. It would be helpful if the rockets and missiles group could receive additional support, particularly in the field of hybrid propulsion. A joint meeting of DRDO, ISRO and the Institute authorities may be convened to define a research programme and the course content which can be given by this group. The Committee has noted with interest the work on the shock tunnel for ISRO. It is hoped that with the association of ISRO and DRDO, the Institute will be able to build fairly soon the hypersonic tunnel which will provide an important facility for basic research and training of students.

2. Department of Chemical Engineering

Research and developmental work conducted in the Department appear significant in terms of the number of awards of Ph.D. Degree, research publications and industrial development projects. The main areas of research are in Reaction Engineering, Transfer Processes and Thermodynamics study. To a limited extent the Department is also engaged in a research activity with reference to Process Dynamics and Control, Bio-Engineering and Environmental Engineering.

The Department can make a significant contribution by taking up projects of national importance in the areas of Reaction Engineering and Transfer Processes. The inherent strength of the Department in Thermodynamics Studies should be enhanced to cover a broader area of studies in Thermo-Physical properties and other transfer Properties of interest in Heat, Mass and Momentum Transfer. The facilities for these studies as existing in the Department are not regarded adequate. The Department is working in

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laboratories housed partly in the Chemistry block. It would be desirable that the Departmental activity now carried on in the older block be shifted to a new building by providing at least 3,000 sq.ft. floor area in the first phase. It is also necessary that the department is provided with additional equipment including testing and instrumental facilities for enabling it to take up industrial projects of national importance. The Department could develop with advantage greater industrial liaison activity so that research work done in the Department could be oriented accordingly and be of proximate national interest.

3. Department of Civil Engineering

The Civil Engineering Department may consider a review of its current research activities. The proposals for putting up earth resources stellite may give a pointer in this regard. The Committee has noted the work in the general field of composite materials in the Structural Engineering section of the Civil Engineering Department. One of the important problems in regard to composite materials is the development of analytical techniques.

(a) Cavitation

The Indian Institute of Science, Bangalore, has done some poineering work in the field of Cavitation for which it has equipment in terms of Cavitation Tunnels and instruments which are not equalled by any other University in India. The only other sophisticated cavitation tunnel is located at the Central Water and Power Research Station, Khadakwasla, Poona. Since the last 15 years or so, a number of contributions have been made in cavitation research particularly through a large number of doctoral theses. These projects have been widely accalimed in international circles. It is, therefore, felt that the cavitation research should be further developed at the Institute and supported by sufficient funds to procure necessary additional instruments and employ research personnel.

(b) Hydraulic Engineering

In the field of Hydraulic Engineering, the Department could embark on several programmes in Systems Analysis applied to Water Resources and Environmental Engineering. These two are indeed interdisciplinary fields and the department may interact with other departments such as Computer Sciences, Mechanical Engineering, Chemical Engineering, Aeronautical Engineering and Bio-chemistry. To begin with it is recommended that a senior person either at the level of Assistant Professor or above, well-versed in Resources Analysis, may be recruited.

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(c) Structural Dynamics

The Institute has made significant contributions in the analysis of structures subjected to vibrations. The problems covered include those in Aero Elasticity, Earthquake Engineering, Machine Foundations, etc. There is scope for interaction with the Geotechnical Engineering group of the same Department as well as inter-departmental research in cooperation with Aeronautical, and Mechanical Engineering departments. The section requires modern equipment and instruments and it has to be suitably supported by research personnel.

(d) In view of the emphasis laid on low-cost housing, it is felt that some research should be directed towards development of new low-cost material specially for building construction. This may also suit the general programme of Materials Science group. It is also noted that the Geotechnical Engineering group is making efforts to obtain low-cost construction material on consolidation of locally available soil and other materials.

(e) Soil-structure Interaction

This is another area in which there is possibility of relevant research that can be carried out with the participation of Geotechnical and Structural Engineering groups. In this area of research also, the Department requires support by way of staff and equipment/instruments.

It would be profitable if the projects could be evolved avoiding duplication within the Institute and the schemes so evolved may involve maximum participation of the available faculty in the Institute.

4. Department of Industrial Management

The Committee noted the recommendations of the Reviewing Committee in regard to the Department of Industrial Management. It wishes to re-emphasise the need for this Department to concentrate on managerial problems relating to the choice, development and use of technology, with a gradual change in the emphasis from the current activities. R&D Management, choice of technology, transfer of technology, project preparation, project management, production management, full efficiency, maintenance, inventory management, environmental factors, Agronomics, systems analysis are among the important topics that come within the range of management of technology. Technological institutes like this Institute are best suited to develop appropriate management concepts in these areas. In fact work in these areas is minimal at present. With the commitment to use planning for Science and Technology as an integral part of national planning, manpower trained for management of technology and R&D management becomes an essential ingredient in the manpower training programme in the country. With its strong

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emphasis in teaching in science and engineering, the Institute offers a logical focal point for having research and course work in these areas.

The Committee accepts the proposal of the Institute for the introduction of a two-year Master's degree course in Industrial Management, the admission being limited as far as possible to Engineering and allied science subjects graduates.

5. Department of Mechanical Engineering

The Committee is glad to note the change in emphasis in the Department of Internal Combustion Engines, greater attention being paid to problems related to the turbomachinery. It deserves further encouragement.

The Committee feels that the Foundry and Forge being with the Mechanical Engineering Department and not with the Metallurgy Department is, in a sense, anomalous. The justification may be that much of the work has been more closely related to Mechanical Engineering. It would seem that close coordination of Mechanical Engineering and Metallurgy in respect of the operation of the Foundry and Forge section will be highly desirable. This may be true in regard to course work and joint research projects also.

This department has been playing a significant role in training mechanical engineers and in conducting research and development work. The expertise and competence of the faculty have attracted grants from several outside agencies to support research activity.

Among the central facilities which have a strong relevance to the needs of this department in particular, workshop occupies the foremost place. Much of the equipment in the workshop is obsolete and adequate support is needed to be provided for modernisation as recommended in the report of the Reviewing Committee.

A material testing system (MTS) to study mechanical behaviour is recommended to be included in the list of equipment proposed to be acquired as central facilities. Besides equipments such as Thermal Sciences and Engineering, Mechanical Systems, Turbomachines and I.C. Engines (includes combustion propulsion), Foundry Science and Engineering and Instrumentation and Control are considered necessary for efficiency.

The research activity in the area of combustion carried out in this department should be appropriately coordinated and integrated with the combustion activity in the aeronautical department. There are highly motivated and competent faculty in both the departments, who could supplement each other in their work.

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6. Department of Metallurgy

Among the Science Departments of the Division of Mechanical Sciences, the Department of Metallurgy is perhaps the most poorly equipped and the least coherent in its instrumental and research programmes. The B.E. course in Metallurgy is the only undergraduate course run in this Division and does not seem to serve any specific purpose with its rather small intake as compared to the national output in this area from 20 departments of its kind in the country. The Visiting Committee recommends abolition of this course in a phased manner and further expansion of the M.E. programme and research activities in the department. An inter-disciplinary M.E. course in Minerals Engineering may be started with an intake of 10 in cooperation with the Faculty of Chemical Engineering and Inorganic and Physical Chemistry departments.

The department has impressive research output in Extractive and Mechanical Metallurgy, but the areas of mineral Beneficiation and Physical Metallurgy need to be further strengthened. Two posts of Professors are recommended, one in Physical Metallurgy and the other in Mineral Beneficiation.

The Visiting Committee is in general agreement with the proposal of the Institute to undertake inter-disciplinary R&D work in Materials Sciences and Solid State Electronics.

The Committee also feels that in the creation of the Central Laboratory facilities, consideration may be given to the requirements projected by the Metallurgy Department to provide them with adequate facilities for research. We have suggested earlier that the Institute may consider the possibility of reorienting the work in the Metallurgy Department to Materials Science activity.

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GENERAL RECOMMENDATIONS

The Committee looked into one of the important recommendations of the Reviewing Committee. This is in regard to the undergraduate programme. The Reviewing Committee has recommended that the Institute authorities may take a very careful view about the continuation of the undergraduate programme. It was clear the divided opinion that existed at that time in the Institute still continues. The Reviewing Committee recommended that if the undergraduate programmes were to continue they cannot be patterned after the existing undergraduate programmes being given elsewhere but should set a pattern of their own. With the coming of the Institutes of Technology giving strong undergraduate programmes, necessity for the Institute to transform their undergraduate programme has become even more urgent. It would appear, while in the Electronics and Electrical Engineering departments some transformation has taken place in the course content, the same cannot be said of the programme in the Metallurgy Department. The Committee therefore, recommends a continuous review of the course programme in the Electronics and Electrical Engineering Departments to introduce new courses to meet the changing needs of the country. It further recommends closing down the present undergraduate programme in the Metallurgy Department at an early date.

The Committee noted with deep satisfaction the manner in which some of the departments of the Institute sought research schemes from various organisations. This has given valuable additional working funds and research fellowships, for the staff to carry on scientific research. It is noted that there are now several agencies giving funds for research. Paucity of funds for scientific research is likely to be a continuing problem in the years to come. The external agencies, by and large, tend to give funds to support research which is in some sense of national relevance. In order that the research in the Institute may be even more purposeful and/more working funds may be obtained, it is recommended that the various departments of the Institute may more aggresively seek support from external agencies for scientific research. The Committee also suggests that the Institute authorities take a good look into the research activities of the various Divisions to see if they are spread a little too thin in some areas without adequate support. The Committee although was not certain, had the apprehension that at least in some fields the research support was inadequate and in the background of limited availability of funds it is better to concentrate in fewer areas with more investments by way of working expenses and research equipment.

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Consequent to the creation of the Divisions, the Committee noted with interest the efforts to evolve common courses among the various Departments belonging to the same Division. The Committee fully supports this venutre which will reduce the load on the Faculty in the teaching programme and enable them to spend more time on fruitful research and offer more electives.

The Committee has noted with considerable interest the programme of the Institute to invite qualified people from the R&D laboratories and the industry to offer elective courses in the Institute. Such a move fosters close working relationships with the industry and the R&D laboratories. This, in turn, can play a decisive role in making the research and teaching programmes of the Institute more purposeful. Strictly speaking, such a programme should essentially be a two-way affair with the Institute Faculty actively seeking regular consultancy work in the R&D laboratories and the industry so that their own background experience will become more relevant to the national needs. The main point to be noted here is that Bangalore, in a very real sense, has become a Centre for high science and high technology research and industry. Interaction of the Institute which also specialises in areas of high science and high technology with the industry and R&D laboratories in Bangalore should therefore substantially enhance the ability of the Institute to contribute more to the country's scientific and technological growth. Since such courses are offered on an elective basis, the Institute retains considerable flexibility in its course programme and will be able to introduce such programmes far less expensively than hiring regular staff to offer such programmes. The Committee, therefore, strongly recommends the Institute's initiative in the development of this programme.

The Committee is really happy to record its appreciation of the discussions it had with the student representatives. The movation with which the students pursue their higher studies along with extra curricular activities is indeed a tribute to the Institute authorities - the teachers and the administrators of the Institute have identified themselves completely with all activities of the students' welfare - academic as well as extra curricular. The students, teachers and the academic administrators of the Institute live in complete understanding of each other in and outside the class-rooms as if belonging to a well-knit family living under the same roof. The Committee is extremely happy in which the Institute has providing the facilities and expertise not only in their academic pursuits but also in their extra curricular activities. The Institute is, indeed, in a very happy situation so far as

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students-teacher relationships are concerned. The Committee wishes that this type of understanding and harmony spreads to cover a large number of universities/institutions in the country. The Committee recommends the provision of a sum of Rs.5 lakhs for students' amenities for providing cine project facilities at the Gymkhana and improvement in the foot-ball, volley-ball, hockey and play grounds, swimming pool, health centre, etc. The Committee has also felt the urgent necessity for additional hostel accommodation for housing the regular students and for continuing education participants. A non-recurring provision of Rs.15 lakhs has been recommended under first priority as indicated under provision for Buildings.

The Committee noted with satisfaction about the creation of Alumni Association. A token grant of Rs.5000/- as non-recurring for the Alumni Association has been recommended.

The Committee has felt the need for more staff accommodation in the campus. But in view of the limited resources, the Committee could only recommend for the provision of Rs.17 lakhs towards additional staff quarters under second priority.

The Committee has appreciated the move of the Institute for restoring the balance in favour of science departments during the current Plan so that the Faculties of Science and Engineering could progress more effectively.

Provision for equipment as recommended by the Reviewing Committee for the various Divisions may form the base line. However, in view of the limited resources, the Institute should be free to exercise its discretion in the procurement of essential equipment for its various Divisions and departments. This will be true also for the teaching and supporting posts. The Committee has been able to suggest creation of some additional faculty positions in some of the Divisions indicating the specialisation in which the Institute could move in its developmental plans and programmes. This, however, should not mean that the positions as recommended by the Committee is final. The Institute within the ceiling available for recurring funds should the freedom to utilise the grants the way it thinks best by recruiting staff in relation to the areas of thrust for development during the current Plan period.

It has been a revealation to the Committee that the Institute has been carrying out its valuable research programmes with equipment which are out-dated and

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obsoscelent. The obsolete equipment shall have to be gradually replaced by the modern ones so that the research output is comparable to international standards. This, however, cannot be done during a single Plan in view of the enormity of the funds required for the purpose. A gradual but sustaining effort on the part of the Institute will be needed to bring the Institute's physical facilities at part with those obtaining in institutions of the developed countries.

FINANCIAL IMPLICATIONS

The Committee recommends a total outlay of Rs.650 lakhs for the development of teaching and research at the Indian Institute of Science, Bangalore. This includes the spill-over from the Fourth Plan as well as grants already approved by the Commission after 31.3.1974. The total outlay consists of Rs.452 lakhs under First Priority and Rs.198 lakhs under the Second Priority. A summary of the recommendations of the V Plan Visiting Committee is given below:

	Priority I	Priority II
	(Lakhs of rupees)	
1. Recurring	65.00	9.00
2. Non-Recurring		
2.1 Equipment as central facilities (committed)	106.00	-
2.2 Equipment as Central facilities (recommended)	93.00	77.00
2.3 Equipment for individual departments (recommended)	80.00	36.00
2.4 Buildings and Campus development (includes spill-over projects from IV Plan)	108.00	76.00
	387.00	189.00
Total Recurring	65.00	9.00
Total Non-recurring	387.00	189.00
Total Outlay on V Plan (I Priority + II Priority)	452.00 + 198.00 = Rs.650.00 lakhs	

The Committee is really very happy to note the cooperation and understanding extended to it by the Director, the faculty members, the student community and the administrators of the Institute but for which it would have been impossible for the Visiting Committee to complete its task.

January 21, 1976

Sd/- K.T. Chandy

Chanchal Mazumdar

P.K. Katti

M.P. Singh

R.C. Mehrotra

B.K. Bachhawat

V. Ramakrishna

L.S. Ramaswami

N.C. Mathur

I.J. Nagrath

B. Nag

T.R. Anantharaman

G.S. Laddha

M.C. Gupta

S.R. Valluri

S. Narasimhan

S.K. Dasgupta

 Indian Institute of Science, Bangalore.

Appendix I

Details for provision under Recurring	Rs. in lakhs
1. Spill-over from the Fourth Plan Projects ..	20.00
2. Expenditure committed for	
2.1 Centre for Electronics Design Technology	10.00
2.2 Molecular Biophysics Unit	10.00
3. Working expenses for inter-disciplinary projects ...	6.00
4. Additional Working Expenses (with the provision of additional facilities through specialised central equipment, it is contemplated that inputs under working expenses would be called for, hence this provision) ...	15.00
5. Provision for essential posts that would be needed ...	15.00
6. Support for Continuing Education Programmes ...	6.00
TOTAL	82.00

* This represents actual expenditure incurred by the Institute before the end of the Fourth Plan period (namely, 31.3.1974), but reimbursed by the U.G.C. after that period.

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p.t.o.

Indian Institute of Science, Bangalore

Appendix II

Details for provision under Equipment as Central Facilities

		Rupees in Lakhs
1.	Commitment already incurred (as detailed below)	106.00
1.1	Computer Expansion -	Rs. in lakhs
	I Phase	22.00
	II Phase	25.00
1.2	Cryogenic facilities	20.00
1.3	Single Crystal X-ray Diffractometer ..	14.00
1.4	Hybrid Computer ..	25.00
2.	Library-books and equipment	15.00
3.	Instrumentation-projects	6.00
4.	General research equipment for augmentation of central facilities	35.00
5.	Electronics Equipment	24.00
6.	Special microscopes, Cameras	5.00
7.	Instrument testing and calibration facilities	10.00
8.	Fabrication facilities ..	20.00
9.	Solid State Electronics and Materials Science programmes ..	40.00
10.	Molecular Biology and Bio-engineering programmes ..	5.00
11.	Co-ordinated Mechanics Programme ..	2.00
12.	Graphic Arts Facilities ..	3.00
13.	Central Stores (inventory build up, especially in the area of Electronics) ..	5.00
	Total	276.00

p.t.o.

Indian Institute of Science, Bangalore
Appendix III

Details for provision under equipment for Departments/Sections

		Rs. in lakhs
1. Division of Physics and Mathematical Sciences		10.00
1.1 Physics	Rs.4.50 lakhs	
1.2 Applied Mathematics	Rs.1.00 lakh	
1.3. Foreign Languages Section	Rs.1.00 lakh	
1.4 Centre for Theoretical Studies	Rs.0.50 lakh	
1.5 Central Instruments & Services Laboratory	Rs.3.00 lakh	
2. Division of Chemical and Biological Sciences		22.00
2.1 Biochemistry	Rs.3.00 lakhs	
2.2 Inorganic and Physical Chemistry	Rs.5.00 lakhs	
2.3 Organic Chemistry	Rs.3.00 lakhs	
2.4 Microbiology and Cell Biology Laboratory	Rs.2.50 lakhs	
2.5 Molecular Biophysics Unit	Rs.8.00 lakhs	
2.6 Central Animal Facility	Rs.0.50 lakhs	
3. Division of Electrical Sciences:		36.00
3.1 Electrical Engineering	Rs.8.00 lakhs	
3.2 Elec.Comm.Engg.	Rs.10.00 lakhs	
3.3 High Voltage Engg.	Rs. 8.00 lakhs	
3.4 School of Automation	Rs.10.00 lakhs	
4. Division of Mechanical Sciences		47.00
4.1 Aeronautical Engg.	Rs.10.00 lakhs	
4.2 Mechanical Engg.	Rs.10.00 lakhs	
4.3 Metallurgy	Rs.10.00 lakhs	
4.4 Civil Engineering	Rs. 8.00 lakhs	
4.5 Chemical Engineering	Rs. 8.00 lakhs	
4.6 Industrial Management	Rs. 1.00 lakh	
TOTAL		115.00

p.t.o.

Details for Provision under Buildings and Campus Development

Indian Institute of Science, Bangalore

Appendix IV

Rs. in lakhs

1.	Spill over from Fourth Plan Projects.	19.00	
2.	For new projects during the Fifth Plan (as detailed below) ..	158.00	177.00
(a)	NEW BUILDINGS: ..	..	98.00
	Departments/Sections/Areas		
	1. Central Laboratory complex for Materials and Electronics ..	45.00	
	2. Biochemistry ..	3.00	
	3. Physics ..	3.00	
	4. Aeronautical Engineering ..	4.00	
	5. Animal Facility ..	2.00	
	6. Civil Engineering ..	2.00	
	7. Chemical Engineering ..	3.00	
	8. Molecular Biophysics ..	5.00	
	9. Hostels (Men..) Rs. 12.00 lakhs Women Rs. 5.00 lakhs Continuing Edn Rs. 14.00 lakhs	31.00	
b)	RENOVATIONS		14.00
	Departments/Sections/Areas		
	1. Inorganic and Physical Chemistry	4.00	
	2. Biochemistry	3.00	
	3. Physics	3.00	
	4. Central Stores.	2.00	
	5. Central Office	2.00	
(c)	CAMPUS DEVELOPMENT		46.00
	1. Completion of the periphery wall (especially since 45 acres and 39 guntas of gift land are expected to be handed over shortly)	3.00	
	2. Augmentation of Water and Power supply facilities (A major portion of the provision will be needed for renovating power wiring in Depts. and this is a matter which has already been identified as of high priority)	13.00	
	3. Additions to the Staff housing	30.00	

p.t.o.

Details for Provision under Buildings and Campus Development

Indian Institute of Science, Bangalore

Progress of schemes accommodated within the IVth Plan allocation for the period 1966-67 to 1973-74

Appendix V

A. Schemes continuing from the III Plan: Rs. in lakhs

i) Amount accommodated in the allocation for 1966-67 to 1973-74 — 157.20

ii) Amount utilised — 132.67 *Rs.12 lakhs being recurring expenditure is also included under B(i) below.

iii) Whether the building projects accommodated in the allocation have been completed. If not, the reasons therefore and the time required for their completion. — -yes-

B. Schemes sanctioned after 1.4.1966:

	Amount provided Rs. in lakhs	Amount utilised Rs. in lakhs
i) Teaching and other posts	66.93	67.42
ii) Library Books/Journals	17.80	17.74
iii) Equipment	71.87	72.57
iv) Teaching Blocks/Laboratories	35.99	33.61
v) Other items (including Fellowships/Scholarships etc.)	-Nil-	-Nil-
vi) Central Library		
a) Building	0.26	0.07
b) Staff	Included under B(i) above	1.81**
c) Books	17.80	17.74@
d) Equipment	1.00	1.09
vii) Students Hostel including Ladies Hostel	8.12	9.05
viii) Students Home/N.R.Sc.	-	-
ix) Teachers Hostel	15.00	15.00
x) Staff quarters		
xi) Health Centre	1.16	1.30

** also included under B(i) above.
@Same as in B(ii) above.

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Contd....Appendix V

Other Items:	Provision Rs. in lakhs	Actuals Rs. in lakhs
Instrumentation Projects	5.30	4.51
11 K.V. ring main change over	3.84	2.21
Water supply	6.00	6.89
Guest House	2.79	3.25
Gymkhana	3.40	2.91
Faculty Hall	1.55	0.48
Central Stores/Gas House	1.75	0.74
Transport Vehicle	0.45	0.45
Telephones	2.00	1.35
Amenities Hall	1.00	1.14
Renovation of old I.M. building	1.04	1.14
Renovations of Guest rooms, Kitchens, etc.	0.60	0.59
	29.72	25.66

(xiii)	Number of additional seats added in the Hostels		300
(xiv)	Number of additional staff quarters added (category-wise)	Academic	20 (47)
		Supporting	27 (-)
(xv)	Number of additional units added in the teachers' Hostel	18+18*	

* A total sum of Rs.41.00 lakhs was provided, out of which a sum of Rs.15.00 lakhs was allocated from the IV Plan , for construction of staff quarters, additional units in the teachers hostel and Extension to guest house. The contribution from the School of Automation and the Centre for Information and Processing was Rs.12.00 lakhs and Rs.14.00 lakhs respectively.

Indian Institute of Science, Bangalore — Appendix VI

STATEMENT SHOWING RECEIPTS UNDER RECURRING FROM 1.4.1966 to 31.3.1974

(RUPEES IN LAKHS)

Sr. No.	Particulars	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74
1.	Maintenance Grant	96.23	103.92	117.14	116.95	119.14	124.00	130.49	126.06
2.	Tuition fees	1.25	1.28	1.35	1.36	1.94	2.51	2.53	2.72
3.	Original Endowments	2.32	2.11	1.79	2.76	2.75	2.68	2.65	2.39
4.	State Grants	1.22	1.17	1.22	1.27	1.12	1.08	1.17	1.22
5.	Other Sources	5.63	6.95	7.37	8.68	10.23	12.89	15.97	21.57
		106.65	115.43	128.87	131.02	135.18	143.16	152.81	153.96

Indian Institute of Science, Bangalore Appendix VII

STATEMENT OF EXPENDITURE UNDER RECURRING FROM 1.4.1966 to 31.3.1974

RUPEES IN LAK

Sr.No.	Particulars	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74
1.	Salaries of teaching and non-teaching staff.	55.64	61.53	65.23	70.65	76.29	75.80	77.91	81.97
2.	Administration-Working Expenses	3.13	2.57	3.21	3.27	3.93	3.92	4.41	4.25
3.	Library-Books & Journals	2.90	3.28	4.10	4.75	5.02	5.74	6.48	6.61
4.	Consumables, Equipment, Contingencies, General Academic Items etc.,	28.81	28.05	29.52	31.94	40.66	38.71	43.42	48.58
5.	Buildings	Nil	Nil	Nil	Nil	Nil	Nil	Nil	Nil
6.	Scholarships	16.11	17.00	18.42	19.27	18.44	19.25	18.37	18.84
	Total	106.59	112.43	120.48	129.88	144.34	143.42	150.59	155.25

CONFIDENTIAL

UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976

Time : 10.30 A.M.

Item No. 9 : To consider the recommendations made by the Committee set up by the Commission to suggest guidelines for formulating courses in History of Science and Technology in the Universities and Colleges.

....

The Panel on History at its meetings held in January and May, 1975 considered the recommendations of the Seminar on History of Science organised by the National Commission for the compilation of History of Science in India in September, 1974. The Panel inter-alia recommended that a Committee may be set up to formulate courses for teaching history of science and technology.

A Committee consisting of the follwing members was set up to formulate courses for teaching of history of science and technology :

1. Professor R.S. Sharma,
Department of History,
Delhi University.

2. Professor F.C. Auluck,
Member-Secretary, National Commission for the Compilation of History of Science in India,
Indian National Science Academy,
New Delhi.

3. Professor K.N. Uduppa, Director,
Institute of Medical Science,
Banaras Hindu University.

4. Professor Ram Behari,
I-C, Market Road, New Delhi-1.

5. Professor Irfan Habib,
Department of History,
Aligarh Muslim University.

6. Shri A.Rehman,
Chief (Planning),
Council of Scientific & Industrial Research
New Delhi.

7. Dr. H.S. Virk,
Department of Physics,
Punjabi University,
Patiala.

P.T.O.

(34)

8. Dr. B.K. Nayyar,
Scientist,
Division for Scientific & Technical Personnel,
N-4, N.D.S.E. Part II
New Delhi.

9. Shri B.K. Thapar,
Joint Director General,
Archaeological Survey of India,
New Delhi.

10. Dr. S.M.R.Ansari,
Reader,
Department of Physics,
Aligarh Muslim University,
Aligarh.

The Committee met in the office of the UGC on February 20, 1976. A copy of the report of the Commission is attached (Annexure). Observations and recommendations of the Committee are in paras I to XV of the report.

The Committee made inter alia, the following main recommendations:

(i) Considering the present position, it may not be advisable to start courses in the teaching of history of science & technology in too many universities at the same time. It was felt that a dozen or so of universities could be identified and supported to develop such courses. The selection of universities would depend on the level of development they had attained in this area.

(ii) Ten junior research fellowships may be instituted for supporting research in this area. The fellowships may be administered centrally by the UGC. These fellowships will be normally available to those departments which have already made some provision for teaching and research in this area. It is important that the selected fellows work with guides who have demonstrated their interest and capacity in this field.

(iii) A non-recurring grant of Rs. 25,000/- may be made available to some selected university departments which have already undertaken studies and research in the history of teaching science and technology. This grant will be available to the central library of the university; books and journals to be bought with the help of this grant will be selected by a committee of the concerned department.

P.T.O.

(35)

It may be mentioned in this connection that the Commission, on the recommendation of the History Panel, has recently sanctioned outside the plan allocation-a post of a reader to the universities of Rajasthan and Roorkee and B.I.T.S., Pillani, to develop studies on the history of Science and technology.

The matter is placed before the Commission for consideration.

AS (HR)/ JS I)

Annexure to Item No.9

University Grants Commis sion

Minutes of the Meeting of the Committee on the History of Science and Technology

...

The Committee appointed to prepare guidelines for courses in the History of Science and Technology met in the UGC Office on February 20, 1976. The following memebrs were present :-

1) Professor R.S.Sharma
Department of History
University of Delhi.

2) Professor F.C. Auluck
Member-Secretary, National Commission for the Compilation of History of Science & Technology
Indian National Science Academy
New Delhi.

3) Professor Ram Behari
I-C, Markot Road
New Delhi.

4) Professor Irfan Habib
Department of History
Aligarh Muslim University
Aligarh.

5) Dr. H.S. Virk
Department of Physics
Punjabi Univers_ity
Patiala.

6) Dr. B.K. Nayyar
Scientist, Division for Scientific & Technical personnel
N-4, NDSE-Part II
New Delhi

7) Dr. S.M.R. Ansari
Reader
Department of Physics
Aligarh Muslim University,
Aligarh.

8. Dr. J.N. Kaul
Joint Secretary,
University Grants Commission.

Professor K.N. Uduppa, Director, Institute of Medical Seieneos, Banaras Hindu University, Shri A.Rehman, Chief (Planning), C.S.I.R., New Delhi and Shri B.K. Thapar, Jt. Director-General, Archaeological Survey of India, New Delhi could not attend the meeting.

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Professor Satish Chandra, Chairman, UGC, was in the chair.

The Committee made the following observations and recommendations:

(i) The Committee welcomed the initiative taken by the Indian National Science Academy in promoting studies and research in the history of science and technology. It was noted that the Indian National Science Academy was already engaged in initiating or undertaking the following activities: (a) bibliographies of scientists in ancient and medieval India, (b) publication of selected manuscripts, (c) Publication of journal on the history of science and (d) organising symposia and seminars on the subject. It was also learnt that the INSA would bring out brief surveys of the development of individual sciences in ancient and medieval India. The INSA would work through an inter-disciplinary team of workers drawn from sciences, technology, agriculture, and medicine on the one hand and history, philosophy and languages on the other.

(ii) The role of the UGC in developing studies of the history of science and technology would be complementary. The UGC will provide encouragement and support for development of teaching in this area and for support to individual research projects. The university-based research may be carried on by individual research students and teachers and would be financed by the Commission through regular research grants available to teachers for this purpose.

(iii) It was pointed out that the teaching of history of science to be developed in the Indian universities will not be confined to India alone. For a better perspective, it would be desirable to comprehend within its scope the teaching of history of science and teachnology all-over the world.

(iv) The Committee noted the information received by the UGC regarding the availability of courses of studies in the teaching of history of science and technology in Indian universities. It was noted that very few universities had provision for such studies and that universities in the south and east of India had no such provision. It was mentioned in this connection that that Division for Scientific and Technical Personnel had a detailed list of courses offered by the universities in the teaching of history of science and technology. Dr. B.K.Nayyar kindly agreed to send to the Commission a list of such universities along with the list of courses offered by them in this area.

(v) Considering the present position, it may not be advisable to start courses in the teaching of history of science & technology in too many universities at the same time. It was felt that a dozen or so of universities could be identified and supported to develop such courses. The selction of universities would depend on the level of development they had attained in this area.

(vi) History of Science & Technology should include philosophy of science and technology. It would be an advantage to involve not only the departments of history, science and technology, etc., but also the departments of philosophy and languages in the selected universities in developing courses in this area.

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(vii) It would not be advisable at this stage to establish a separate department or a separate centre for developing and offering courses in the history of science and technology. Ways of interaction and collaboration among concerned departments should be developed and institutionalised to evolve a pragmatic working system.

(viii) Courses in the history of science and technology may be offered both at the undergraduate and postgraduate levels. Whether a course should be initiated by the university first at the undergraduate or at the postgraduate level is best left to the university which will decide this question in the light of the available facilities, particularly, the competence and interest of its faculty. Considering, however, the balance of advantages it would be advisable to make a start with postgraduate courses leading on to research in a university which does not have any course in this area either at the undergraduate or postgraduate level. This will enable the university to prepare an appropriate faculty for both undergraduate and postgraduate courses.

(ix) At the undergraduate level, the foundation course should emphasis comparative development of science and technology and attempt a global perspective of the subject.

(x) The courses in the history of science and technology should include a foundation course for all students and depth courses in special fields either on the basis of different periods of history or on the basis of growth of specific disciplines in given periods of history.

(xi) Research in the history of science and technology will have to be undertaken not in one but in all the concerned departments. For this purpose, it will be necessary to have an institutionalised mechanism in the universities to foster and coordinate research in different disciplines on individual or collaborative basis.

(xii) Ten junior research fellowships may be instituted for supporting research in this area. The fellowships may be administered centrally by the UGC. These fellowships will be normally available to those departments which have already made some provision for teaching and research in this area. It is important that the selected fellows work with guides who have demonstrated their interest and capacity in this field.

(xiii) A non-recurring grant of Rs.25,000/- may be made available to some s-elected university departments which have already undertaken studies and research in the history of teaching science and technology. This grant will be available to the central library of the university; books and journals to be bought with the help of this grant will be selected by a committe of the concerned department.

(xiv) Professor Irfan Habib kindly agreed to prepare a draft outline of syllabus for undergraduate and postgraduate courses in the history of scince and technology and send the draft to the UGC by the end of March, 1976. This draft would include a statement giving the objectives of the courses and the competency expected to be developed at different levels. The outline will also include a list of recommended books and journals.

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(xv) The Committee desired that Dr. C.S.Jha, Director, Indian Institute of Technology, Kharagpur, may be requested to send to the Commission a note on the courses on history of science and technology at present offered by the I.I.T.s/Engineering Universities/Colleges.

The Committee concluded its deliberations with a vote of thanks to the chair.

SLK/-

CONFIDENTIAL (40)

UNIVERSITY GRANTS COMMISSION

Meeting:

Dated : 29th Apri, 1976.

Item No. 13 To consider the report of the Committee appointed by the Commission to consider the proposal of School of Planning and Architecture, New Delhi for declaring it as an Institution deemed to be university under Section 3 of the UGC act.

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The question of declaring the School of Planning and Architecture, New Delhi an affiliated college of Delhi University as a deemed to be University under Section 3 of the UGC Act has been under the consideration of the Commission since 1970. The University Grants Commission at its meeting held on 11th November, 1974 further considered this proposal and agreed that a Committee may be appointed to examine the proposal of the School of Planning and Architecture, New Delhi to declare it as a "Deemed University" under Section 3 of the UGC Act. The Committee may also consider various alternative measures which could ensure its autonomy and high academics standards. Accordingly the Commission constituted a Committee with following members :-

1. Shri K.T. Chandi,
   Chairman,
   Kerala State Industrial Development Corporation
   Ltd., Trivandrum.

2. Shri F.B. Pithavadian,
   Director,
   School of Architecture and Planning,
   Madras University.

3. Professor Rattan Kumar,
   Professor & Head,
   Deptt. of Architecture & Planning,
   Roorkee University,
   Roorkee.

4. Shri V.V. Bodas,
   Sr. Architect Planner,
   D.D.A. New Delhi.

The Committee visited the School on the 29th-30th of July, 1975 and held discussions with the students, teachers and School authorities. The Committee also visited the various departments of the School. A copy of the report of the Committee is attached. (Appendix).

The main recommendations of the Committee are given below :-

A. The Committee, in the light of the discussions it had with the School authorities and in relation to what it has been able to observe during its visit is convinced that the growth of the School of Planning and Architecture is in national interest and the School has reached a level of expertise to act as a pace setter in the country in the

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disciplines of architecture and spatial planning.

2. In terms of the guidelines laid down by the U.G.C. (Annexure-VI) the Committee is of the view that in all aspects of architectural design and spatial planning the School is engaged in teaching and research and has achieved in these chosen fields the highest academic standards in the country. The Committee, further, holds the view that in these fields the School has a very high standard and is making a distinct contribution to the university system and by according a deemed university status to the School under Section 3 of the UGC Act the Committee is convinced that the university system would be enriched. Further the Committee is of the opinion that by so doing, it will help the School to enhance the development of architecture and spatial planning and their teaching and research.

3. The Committee is aware that the School is fully financed by the Government of India for its maintenance and development. For 1975-76, the Government of India has already allowed Rs. 35.40 lakhs for its development and maintenance (Annexure - V). Further, it has been possible for the institute to have a building complex costing Rs. 40.57 lakhs with assistance from the Government of India. It has adequate accommodation for the present level of activities in the Indraprastha Estate, where two multi-storied buildings within 3.67 acres of land is already available to the School which also provides hostel accommodation to nearly 90 students in the Campus. The School has also been able to acquire 5.1 acres of land at a distance of 8 Km's from the School premises for residential facilities for its staff members. A sum of Rs. 65 lakhs is expected to be provided for this purpose, by the Government of India in the current plan. The School charges approved tuition fees. Thus the School is financially viable. If the School is accorded a deemed to be university status no extra financial burden will fall on the Government.

4. As for management, the School is managed by an autonomous body set up by the Government of India. The composition of the Governing Body at present includes representatives of Institute of Town Planners, Indian Institute of Architecture, A.I.C.T.E. and Institution of Engineers. (Annexure VI).

5. Since this School has to act as a pace setter in the country in its fields of specialisation, the Committee would like to suggest that adequate representation to the schools of Architecture/Departments of Architecture of universities be also ensured in the Governing Body and other appropriate authorities of the School. The Committee notes that consequent upon the School being declared as a deemed to be university under Section 3 of the UGC Act, it will be necessary for the UGC to review the Memorandum of Association and Rules of the Society and the constitution and functions/duties of various committees/authorities of the School.

6. The Committee further recommends that in the development programmes of the School under successive five year plans, the School authorities should be required to include a specific proframme for faculty improvement for the professional enrichment of teaching and technical personnel working in other recognised Schools/Institutions in the country or University Departments engaged in architectural designs and

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spatial planning. The details of such a programme may be settled in consultation with the UGC.

7. The Committee notes that the School has submitted its 5th plan development proposals to the Government. These proposals may be examined by UGC as and when "deemed to be university" status is conferred on the School.

The Committee notes that as and when such a notifications issued conferring deemed to be university to the School, the internal structure, goverance of the School and all other relevant aspects would be reviewed by the Commission. A programme for institutional collaboration for field operation in the different regions of the country would also need to be worked out by the UGC in consultation with the School authorities to pave the way for the School to act as a pace setter in architectural designs and spatial planning in the country.

It may be pointed out that Section 9A of the Delhi University enables the University to declare College conducting courses of study in the faculties of Medicine, Technology, Music provided that the extent of autonomy which each such College may have and the matters in relation to which it may exercise such autonomy , shall be such as may be prescribed by the Statutes.

The matter is placed before the Commission for consideration.

AS (CP)/Addl Secy.

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Appendix to the Item No.10

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UNIVERSITY GRANTS COMMISSION

Report of the Committee appointed by the University Grants Commission to examine a proposal to declared the School of Planning and Architecture as a deemed to be university under Section 3 of the UGC Act.

At its meeting held on 11th November, 1974, the University Grants Commission decided that a Committee be appointed to examine a proposal for conferring deemed to be university status to the School of Planning and Architecture, New Delhi under Section 3 of the UGC Act. The Commission further indicated that this Commitee might also consider various alternative measures which could ensure the autonomy and high academic standards of the School. Accordingly, the following Committee was constituted by the Commission to examine this proposal and make recommendations :-

1. Shri K.T. Chandy,
   Member, UGC and Chairman,
   Kerala State Industrial Development Corporation Ltd.,
   Trivandrum.

2. Shri V.V. Bodas,
   Architect Town Planner
   Delhi Development Authority,
   New Delhi

3. Professor Rattan Kumar,
   Professor and Head,
   Department of Architecture & Planning
   Roorkee University
   Roorkee.

4. Professor F.B. Pithavadian
   Director,
   School of Architecture & Planning,
   Madras University,
   Madras.

2. The Committee visited the School on the 29th-30th of July, 1975 and held discussions with the students, teachers and the School authorities in this connection. The Committee also visited the various Departments of the School.

3. The School of Town and Country Planning was set up by the Government of India on the recommendations of the AICTE as an autonomous body in July, 1955. In October, 1959, the Department of Architecture of the Delhi Polytechnic was added to it. Over the years, the School has developed into a leading Instituion of the kind in the area of spatial planning and architecture.

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4. The Committee noted that the question of declaring the School "as a deemed to be university" was first brought before the Commission in February, 1970. The Commission then took the view that the Government of India might be requested to explore the possibility of associating the School with Jawaharlal Nehru University. The School authorities represented that having been constituted as an autonomous body from its inception and having developed an educational programme of high standards, it should be necessary to continue its autonomy in specifying standards, in conducting its own examinations and in administering its affairs, for the School to maintain its momentum of growth. If the School were to be associated as a School of Studies within the framework of Statute 18 of the Statutes of the Jawaharlal Nehru University, it would lose the status and freedom of action which it has already attained. The Statute of the University did not provide for any other type or association of the School with the University. If it has to become a School of Studies under the University the decisions of the Board of Governors and of the academic committees of the School would come within the control of the Academic Council and other authorities of the University and the autonomy which has been the main factor for its rapid development in educational programmes would be lost. The School also desired to ensure that the Director of the School as a status different from that of Dean of the School of Studies as provided for in the statutes of the University. On the other hand, the University could not agree to enter into any arrangements which did not ensure academic control and supervision over the school whether it be constituent unit or a recognised institution under its auspices. In view of the above, the Ministry of Education & Social Welfare informed the Commission in December, 1971 that the proposal of associating the School with the Jawaharlal Nehru University was not acce to that University.

5. The matter was again considered by the Commission in February, when it was decided that the Ministry of Education & Social Welfare be requested to consider the possibility of Delhi University declaring the School as an autonomous College under its amending Act. Incidentally, the Department of Architecture of the School prepare students for the degree in Architecture given by the University. On the other hand, the School is concerned with preparing students for National Diploma in Architecture which is an educational award outside the Delhi University framework; the School also has its activities in the areas of spatial planning which are also outside the purview of the University.

6. The Delhi University informed the Commission in May, 1973 that

> "Under the Delhi University Amendment Act, 1972, a provision has been made by which the University has been empowered to declare with the consent of the college concerned in the manner as specifiedby the Academic Council, Colleges conducting courses of study in the Faculities of Medicine, Technology, Music or Fine Arts as autonomous colleges. The extent of the autonomy which a college may have and the matters in relation t which it may prescribe such autonomy, shall be such as may be prescribed by the Statutes.
>
> In the light of the above provision, the University would be g to consider the question of declaring the School of Planning a

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Architecture as an autonomous college on receipt of an application to this effect from the College, which will be placed before the Academic Council."

7. The School of Architecture did not submit a proposal to Delhi University for declaring the School as an autonomous college within the scope of the amended Delhi University Act, The following reasons were given by the School:-

a. In case it became an autonomous college, it will still not have the full freedom to formulate, approve and implement new syllabi so necessary for the courses run by it as well as new courses envisaged it as part of its development programmes.

b. The number of students within the school being very limited, any comparison with other Departments by the University authorities will hamper the growth of the institution.

c. The existing faculties and the established practice of the University may not admit complete autonomous functioning in academic, administrative and financial matters.

d) The status of teachers of the School now enjoyed as Professors and Readers is not recognised as such by the University. In fact Professor of the School is recognised only as a Lecturer by the University.

e. The methods of appointment of staff (Full-time and part-time) are peculiar to the needs of the School and do not fit in with the accepted modes and methods required to be followed in case it was part of the University as an autonomous college.

f. The selction procedure for admission of students is als different from that followd by the University.

g. There was no separate faculty for Architecture or spatial planning in the University. Architecture was treated as coming within the purview of the faculty of sciences, while there wasnno position at all for spatial planning in any other faculty of the University. In so far as the teachers of the School were not recognised by t he University as professors and Readers and its Director alone was recognised as a member of the Faculty of Sciences, the academic autonomy of the Institution was not recognised by the University in the manner in which autonomy would be required for the faculty of the School to be able to lay down standards of education in the areas in which they are concerned.

Eventually, Delhi University indicated to the Ministry of Education & Social Welfare that it would have no objection to the proposal of conferring the status of "deemed to be university" on the School.

8. The Commission again on a suggestion by the Ministry of Education considered this proposal at its meeting held on 12th-13th April, 1973 when it was decided that the proposal may be referred to its Standing

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Committee on New Universities and University Centres to indicate the criteria that might be adopted for recommending institutions to be deemed as universities. The Commission subsequently at its meeting held on 8th October, 1973 agreed with the recommendation of the Standing Committee on New Universities that the Commission may obtain expert advice about the standing of the School in the specialised fields and the matter brought up again before the Commission. In the light of the guidelines adopted by the Commission at its meeting held on 8th July, 1974, the proposal of conferring deemed to be university status to the School of Planning and Architecture, New Delhi was further considered by the Commission at its meeting held on 10th November, 1974. The present Committee has been appointed by the Commission in pursuance of the decision.

The Committee noted the following in the course of its visit to the School.

9. The present educational objectives of the School are:-

a) To prescribe and conduct courses of training in all aspects of rural, urban and regional planning architecture, landscape architecture and allied subjects.

b) To sponsor and undertake research in all aspects of rural urban and regional planning, architecture, landscape architecture and allied subjects.

c) To co-operate with any other organisation in the matter of education, training and research in rural, urban regional planning, architecture, landscape architecture and allied subje

10. The School has at present facilities for the following courses in teaching and research :-

1. Bachelor's Degree Course in Architecture
2. National Diploma Course in Architecture (Part-time)
3. Postgraduate C ourse in Architecture (Urban Design)
4. Integrated Postgraduate Course (diploma) in Town & Country Planning with specialization in Urban andRegional Planning.
5. Integrated Postgraduate Course (diploma) in Town & Country Planning with specialization in Housing and Community Planning
6. Integrated Postgraduate Course (diploma) in Town & Country Planning with specialization in Traffic and Transportation planning.
7. Integrated Postgraduate Course (diploma) in Landscape Archite
8. Pre-Postgraduate Diploma Course in Landscape Architecture Cou
9. Special Postgraduate Course in Town & Country Planning.
10. Special Postgraduate Couse in Traffic and Transportation Planr

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The details of the above courses like standard of the course, duration, intake and enrolment are given in Annexure I.

11. The School organizes the above courses in its Departments of Architecture, Town & Country Planning, Housing & Community Planning, Traffic and Transportation Planning, and Landscape Architecture and Urban Research Unit.

12. The School was granted recognition as a Constituent College of Delhi University since 1959 for conducting Bachelor or Arts degree course in Architecture. It is at the same time an affiliated institution of the A.I.C.T.E. for conducting the National Diploma course in Architecture on a part-time basis but equivalent to the degree course. The diploma courses are all recognised for employment purpose by the Central and State Governmtns.

The School was granted recognition as a constituent college of Delhi University since 1959 for conducting Bachelor of Degree in Architecture, but not for any other educational programmes offered by the School. The School is an affiliated Institution of AICET for conducting the National Diploma course for the benefit of a part-time students; and this diploma is equivalent in standards to the degree course in Architecture. The other diploma courses offered by the School are also recognised for employment purposes by the Central and State Governments.

Though postgraduate diplomas awarded by the School are of high standard and are equivalent to the postgraduate degrees awarded by Universities, they are not specified as degrees under the provisions of the UGC Act in so far as they are not awarded by a University or an Institution deemed to be a University.

The School has been able to continually review and redesign its courses according to chanding needs. It has been able to enrich content of courses in the fields of Architecture, Urban and Regional Planning, Traffic & Transportation Planning, Landscape Architecture and Urban Design. It is training personnel in all aspects of spatial planning and design for State Governments, public sector bodies, private agencies, municipal and other local bodies.

The syllabus and scheme of examination of Bachelor's degree course in Architecture and National Diploma in Architecture were revised throughly in 1965-66 and 1969-70. The School is now engaged in developing these courses further, as many new factors which effect the environment make it necessary for an architect "to understand the sociological, political, economic, and techn ological factors involved in satisfying man's desire for economic, safe and efficient living". The approach proposed, therefore, is to provide a broad based training in the first three years in order to give the student a depth of knowledge in architecture and later in two more years, (after practical experience of oneyear in an office/building industry or construction) to enable him to specialise and obtain a degree in general

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architecture/building technology/interior design keeping of course, architectural design as the main and dominating theme. This all students will receive instruction in basic courses in architectural design, service & equipment, building economics, professional practice and management of construction and allied activities. The special subjects would be urban and regional planning, landscape architecture and building structures under general design. For building technology the special subjects would be Advanced building science, Advanced building construction with Mathematics, Physics and Chemistry and were in environmental Science. For interior design the science subjects would be materials of construction, illumination and acoustics.

17. The Department of Town and Country Planning like the Department of Architecture is also engaged in reviewing its educational programmes. The current proposal offers specialisation in urban and regional planning, housing and community planning and traffic and transportation planning. Apart from revising curriculum in these three major areas, the Department is proposing to institute a course in development planning which will provide a balanced blend of theory and techniques of planning on the one hand and the operational and implementation aspects on the other. This programme will provide training for inservice personnel of various background apart from benefiting fresh graduates of civil engineering/ architecture/town planning. The Department recognises that it should hellp in strengthening the capabilities of the existing cadres of town planners for the due performance of their assigned roles.

18. In 1969, the School replaced its diploma course in housing for training qualified Architects and Engineers in the field of Housing by an integrated course in Town & Country Planning with specialisation in Housing and Community Planning. A Rural Housing Wing set up by Government of India is also functioning in the School since 1959 with a view to training technical personnel employed in Community Development Blocks in the States. This Wing, apart from imparting training also conducts research in the field of rural housing and Village Planning and redevelopment. This Wing at present operates in Delhi, Rajasthan, U.P. and Bihar, the rest of the States being convened by 5 other similar Wings set up by the Central Government elsewhere in the country.

19. Similarly the School is constantly reviewing the courses in Traffic and Transportation Planning in the light of the rapidly changing technology and needs arising out of socio-economic development. A harmonous relationship is to be established between the systems of traffic and transportation by road, rail, water and air at the local, regional and national levesl. An urban designer is to be trained to design and organise the process of building for creating an environment in keeping with the needs of Community . The postgraduate diploma course revised since 1969 takes note of these changing needs. Similarly the course developed by tthe School in landscape architecture is intended to help a landscape architect t conversant in natural sciences so that he is in a position to adapt nature for human use by his skill. The problems of air, water and noise pollution are already being faced by the major cities of the country. The course in landscape architecture was started in the school from 1971 and the School has thus the distinction of being the first institution to start

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this course in the whole of South-East Asia. The curriculum is flexible and suits horticulturists/botanists/foresters/geologists/ecologists and others. All these indicate how it is necessary to have pace setting institutions in these fields.

20. The Committee is happy to note that the School of Planning and Architecture is already recognised as such in the discipline of design and spatial planning.

21. The School has over a period of time built up an excellent body of well-qualified teachers (Annexure II) who are interested in the practice of architecture and spatial planning and in the academic research related to live problems in these areas. The papers published/ projects undertaken (Annexure III) by them bear testimony to this. The School has a tradition of permitting its faculty to undertake consultancy practice subject to such rules and regulations as laid down by Government of India. This has helped the School to have a "live body of experts" on its staff. The School has also a body of part time teachers to teach its course. They areeager to associate themselves with the teaching activities of the School not for the remuneration offered to them, but for the advantage of interaction with the various departments as the School is the only one of its kind in the country which provides such experties in planning, economics, sociology, traffic & transportation, environmental planning, landscape architecture, urban design etc. besides architecture. The numbers of the faculty, the Committee is happy to observe, have not only contributed to the enrichment of academic programmes and curriculum - development, but many of them are also actively engaged in research and professional work of merit. They have by virtue of their all-round experience in teaching, research and professional practice been able not only to continually engage themselves in improving standards of instruction education and examination and utility of the courses but have also enabled the institution to become a reputed organisation within the country and abroad.

22. The Ministry of Education while commending the proposal for consideration of the Commission has stated :

"The School is a major Institution for advanced studies and research in town and country planning, housing, transportation, planning, landscape architecture and other specialised fields of importance to our country. The School is the only one of its kind in India which has earned recognition both within the country and abroad. Its Department of Architecture is a leading centre for architectural education and has been recognised as one of the best Schools in the Commonwealth. The has a faculty of over 50 persons working in an inter-disciplinary manner and over a period of year, and has been able to grow into a major National Centre of Advanced Study and Research."

23. The Ministry of Education has further recommended that "the School deserves to be recognised as a deemed to be university." In the view of the Ministry "this status will not only be a fitting recognition of the useful work done by it but would also encourage the faculty to strive for high levels of excellence."

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24. The Committee is aware that the Visiting Board of the Commonwealth Association of Architects which came to India and inspected the School in 1972 has paid rich compliments to the high standards maintained by the School which has been recognised as a premier institution in this field by various Commonwealth countries.

25. The Committee further notes that the Joint Board of Commonwealth Association of Architects and Indian Institue of Architects visited the School in February 1975 when the following observation has been made :

"The Board was greatly impressed by what it saw. Relationships between staff and students within both the Department and the School has been excellent giving the impression of an organisation controlled by pious but sympathetic guidance. Much of the work is at a high level and when weaknesses were observed the staff were aware of them and were already trying to put matter right. The obvious dedication of staff and students to the serious business of architectural Education made the visit a most rewarding experience for the members of the Board. The Visiting Board recommends that the recognition be continued for the next 5 years of the Bachelor Degree Course in Architecture in the School of Planning and Architecture."

26. The Committee has further noted that the architects who have qualified from the School hold senior position in Government/public undertaking and other institutions. The same is the case with the town planners who have qualified from the School. The Central/State Governments and local authorities are also deputed regularly a larger proportion of their officials for higher training in town and country planning to the School.

27. The Committee has also noted the following observations of the School authorities regarding facilities for Ph.D. work:

> "The analysis of the contents of the two books, "Education in Universities in India- 1964-65" (a statistical survey), published in 1971 by the Ministry of Education and Youth Services, Government of India, and "Research in Progress," 1958-66 (Volume I, Physical Sciences), published in 1968 by the Inter-University Board of India and Ceylon, reveals that only a few students in the field of engineering enrolled for Ph.D. during the period from 1958 to 1966. Out of 228 registrations with the Indian Universities, only 7 candidates were awarded the Doctorate over a period of 8 years. The same record suggested that the majority of registrations in the field of engineering for the doctorate programme have been made from 1960. As the post-graduate programme in engineering gathered momentum in 1950s, the Ph.D. programmes in the field of engineering could really be initiated after a lapse of a decade. Keeping in view the development of doctoral programmes in engineering and pattern of development in respect of education and training in Town and Country Planning and related fields at the post-graduate level, the time is now opportune to initiate doctoral programmes in the field of Town and Country Planning.

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The postgraduate training and advance study in Planning and Architecture commenced in the country in 1956 and 1968 respectively. Efforts have so far been made to develop and consolidate the postgraduate training for initiating, at the opportune time, the doctoral programmes in the School. As adequate number of academic and research institutions are in existence in the field of Architecture as well as Planning, it is now considered that research oriented scholars with doctorate qualifications would profitably utilize their advance knowledge in the field of their employment.

The preparatory work for instituting the Ph.D. or equivalent programmes are under the consideration of the School. Some of the members of the Faculty are even now associated with doctoral programmes.

The recognition of the school as a deemed university will certainly accelerate the progress of the School of Planning and Architecture in instituting advance courses leading to doctoral and post-doctrol studies in the specialised fields of Architecture and Planning."

28. The Committee observes that the School has undertaken a large number of studio exercises, thesis projects and other programmes which yield a massof valuable reference material. The School has at present two libraries located in the Departments of Architecture and Town & Country Planning with 30647 volumes of books. It is already functioning as documentation centre pertaining to design and planning and is serving other academic institutions/research organisations with valuable data and information. It also disseminates information, research findings, methodologies, techniques, through its publications but the Centre has to develop further to increase its utility in the country.

29. The School authorities were specifically requested by the Committee to indicate whether it could notbe an autonomous college within the Delhi University or be an associated institution of Jawaharlal Nehru University. The Committee's attention was first drawn to the results of the discussions/decisions in this respect, which is indicated earlier in para 3-6 of this report.

The School authorities further indicated the following reasons :

1. The School is awarding only diplomas at present except the B. Arch. Degree for which it is affiliated to Delhi University. Since no degrees at the undergraduate and postgraduate levels are awarded by the School to its students the School hasnot been able to start courses at high level like M. Arch. or Ph.D.

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2. Even for the B.Arch. Course, the School which is conducting examinations/formulating syllabii drawing up schemes of examinations/appointing examiners is facing innumerable difficulties as at every stage approval is required to be obtained from the Delhi University The School has its own expert Academic Committees/Course Committees and after their approval, the procedure is that any change in the syllabus or a part of the subject is to be ratified by the university, which is not only cumbersome and prolonged but sometime embarrassing too. There are instances where for example, any change in subjects applied to architecture have to be approved by Heads of Departments or Committees of Courses of other subjects with no relation to architecture. They will increase if all the other diploma courses are also affiliated to the University to facilitate awarding of degrees.

3. Procedure of selection of students to various courses in the School is different from what are normally followed by universities e.g. eligible candidate possessing prescribed minimum qualifications are also required to appear for a performance test given by the School and 50% marks are given to such a test while preparing the merit list. Such procedures may have to be dispensed with in case the School is within another University. Similarly admission procedures vary from one postgraduate diploma course to another in the School.

4. The School has part-time courses which are not acceptable to the university because of their effects on other courses run by the University.

5. The selection of part-time teachers on short-term basis may not be in line with the general policy of the University.

6 One of the reasons for the eminent position attained by the School is that individual consultancy practice has been allowed by the School and the system followed by the School in this respect may not be acceptable to the University.

7. The School has already a built in mechanism for continually reviewing courses and making them not only suited to the changing social needs but also comparable to international standards. These changes are vetted by Expert Courses Committees before adoption and experts are drawn from various fields. After such detailed and elaborate exercises, the process will required to be repeated to obtain approval of the competent authorities of the University. This will mean, courses will not be updated or modified when required.

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8. If the School is empowered to award its own degrees, subject courses can be better organised.

9. The machinery already available with the School will be in a position to implement programmes of innovation at a faster pace.

10. The students have a feeling of uneasiness as the School is awarding only diplomas in place of degrees.

11. The School will be in a better position to establish inter-relations with other similar teaching institutions or departments in the country.

12. The growth of the School demonstrates its capacity to restructure its courses according to the felt needs of the country.

30. The Committee, in the light of the discussions it had with the School authorities and in relation to what it has been able to observe during its visit is convinced that the growth of the School of Planning and Architecture is in national interest and the School has reached a level of expertise to act as a pace setter in the country in the disciplines of architecture and spatial planning.

31. In terms of the guidelines laid down by the U.G.C. (Annexure V) the Committee is of the view that in all aspects of architectural design and spatial planning the School is engaged in teaching and research and has achieved in these chosen fields the highest academic standards in the country. The Committee, further, holds the view that in these fields the School has a very high standard and is making a distinct contribution to the university system and by according a deemed university status to the School under Section 3 of the UGC Act the Committee is convinced that the university system would be enriched. Further the Committee is of the opinion that by so doing, it will help the School to enhance the development of architecture and spatial planning and their teaching and research.

32. The Committee is aware that the School is fully financed by the Government of India for its maintenance and development. For 1975-76, the Government of India has already allowed Rs. 35.40 lakhs for its development and maintenance (Annexure V). Further, it has been possible for the institute to have a building complex costing Rs. 40.57 lakhs with assistance from the Government of India. It has adequate accommodation for the present level of activities in the Indraprastha Estate, where two multi-storied buildings within 3.67 acres of land is already available to the School which also provides hostel accommodation to nearly 90 students in the Campus. The School has also been able to acquire 5.1 acres of land at a distance of 8 Km's from the School premises for residential facilities for its staff members. A sum of Rs. 65 lakhs is expected to be provided for this purpose, by the Government of India in the

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current plan. The School chrges aoproved tuition fees. Thus the school is financially viable. If the School is accorded a deemed to be university status no extra financial burden will fall on the Government.

33. As for management, the School is managed by an autonomous body set up by the Government of India. The composition of the Governing body at present includes representatives of Institute of Town Planners, Indian Institute of Architecture, A.I.C.T.E. and Institution of Engineers. (Annexure VI).

34. Since this Shool has to act as a pace setter in the country in its fields of specialisation, the Committee would like to suggest that adequate representation to the Schools of Architecture/Departments of Architecture of universities be also ensured in the Governing body and other appropriate authorities of the School. The Committee notes that consequent upon the School being declared as a deemed to be university under Section 3 of the UGC Act, it will be necessary for the UGC to review the Memorandum of Association and Rules of the Society and the constitution and functions/duties of various committees/authorities of the School.

35. The Committee further recommends that in the development programmes of the School under successive five year plans, the School authorities should be required to include a specific programme for faculty improvement for the professional enrichment of teaching and technical personnel working in other recognised Schools/Institution-s in the country or University Departments engaged in architectural designs and spatial planning. The details of such a programme may be settled in consultation with the UGC.

36. The Committee notes that the School has submitted its 5th plan development proposals to the Government. These proposals may be examined by UGC as and when "deemed to be university" status is conferred on the School.

The Committee notes that as and when such a notification is issued conferring deemed to be university to the School, the internal structure, governance of the School and all other relevant aspects would be reviewed by the Commission. A programme for institutional collaboration for field operation in different regions of the country would also need to be worked out by the UGC in consultation with the School authorities to pave the way for the School to act as a pace setter in architectural designs and spatial planning in the country.

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ANNEXURE-I

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Existing courses of studies in the School of Planning & Architecture

Name of the Course	Standard of the Course	Duration of the Course.	Intake	Enrolment
1. Bachelor's Degree Course in Architecture	Bachelor's Degree. (Delhi University)	5 years	36	180
2. National Diploma Course in Architecture (Part-time)	Bachelor's Degree	7½ years Each Class of 1½ year.	15	75
3. Postgraduate Diploma Course in Architecture (Urban Design)	Master's Degree	2 years	10	20
4. Integrated Postgraduate Diploma Course in Town & Country Planning- Specialization in Urban and Regional Planning	Master's Degree	2 years	20	40
5. Integrated Postgraduate Diploma Course in Town & Country Planning - Specialization in Housing and Community Development)	Master's Degree	2 years	10	20
6. Integrated Postgraduate Diploma Course in Town & Country Planning - Specialization in Traffic in Transportation Planning.	Master's Degree	2 years	10	20
7. Postgraduate Diploma Course In Landscape Architecture	Master's Degree	2 years	15	30
8. Pre-Landscape Architecture Course	Preparatory Course	1 year	8	8
9. Special Course in Town & Country Planning	Postgraduate	1 years	6	6
10. Special Course in Traffic & Transportation Planning.	Postgraduate	1 year	6	6
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COURSES PROPOSED FOR 1974-79

1.	Integrated Course in Architecture.	Bachelor's Degree
2.	Postgraduate Course in Architecture.	Bachelor's Degree
3.	Postgraduate Course in Architecture.	Master's Degree
4.	Postgraduate Course in Interior Industrial Design.	Master's Degree
5.	Research Degree Course in Architecture Planning.	Ph.D.
6.	Postgraduate Diploma Course in Building Science.	Master's Degree
7.	Postgraduate Programme in Rural Planning & Development.	Master's Degree.
8.	Postgraduate Programme in Advanced Regional Planning and Development.	Master's Degree
9.	Postgraduate Programme in Development Management.	Master's Degree
10.	Postgraduate Course in Housing and Management.	Master's Degree
11.	Postgraduate Course in Traffic Management and Design.	Master's Degree

ANNEXURE-II

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Staff Members and Their Qualifications

Director

1. D.V.R. Rao, B.Sc.B.Arch(L'Pool) M.C.P. (Penn.U.S.A.), A.R.I.B.A., F.I.T.P.

Registrar

B.R. Umarji M.A.

Department of Architecture

Professor of Architecture and Head of the Department.

1. Prof. C.SH. Jhabvala, F.I.I.A. A.R.I.B.A.

Professor of Architecture

2. Prof. Ranjit Sabikhi, B.Arch(L'Pool) M.C.D.(L'Pool) A.R.I.B.A.

Professor of Covil Engineering

3. Prof. S.K.Narayana, B.Sc.B.E. A.M.I.E.

Associate Professor of Architecture

4. Prof. V.P.Raori, B.Arch.Cert T.P. (Rome), A.II.A., A.M.I.I.T.P.(Italy)

Associate Professor of Structural Engineering.

5. Prof. K.A.Patel, B.E.M.Tech. A.M.I.E.

Assistant Professors of Architecture

6. Shri Surendra Sharma, B.Arch. A.I.I.A.

7. Shri Y.R.Gupta, B.Arch.M.Arch. (Columbia) A.I.I.A.

8. Shri M.R.Agnihotri, N.D. Arch., A.I.I.A. Cert. T.P.(W.Germany).

9. Shri K.B.Singh B.Arch. M.Arch. (Yugoslavia)

10. Shri R.P.Sharma, B.Arch., M.L.A. (Harvard), M.Arch.(Pratt.)

11. Shri R. Bahadur, N.D. Arch. Dip. T.P.(London) A.I.I. A.

12. Shri M.L.Mehta, B.Arch.M. Building Science (Australia) (on study abroad)

13. Shri P.N.Mathur, G.D. Arch. A.R.I.B.A.

14. Shri H.D.Chhaya, B.Arch. (Hons.) A.I.I.A.

15. Shri R.K.Bhalla, B.Arch. (Hons.) A.I.I.A.

Assistant Professor of Engineering

16. Shri T.S. Narayanaswamy, B.E.

Assistant Professor of Art

17. Shri O.P.Sharma, B.A. N.D. (Fine Arts)

Lecturers in Architecture

18. Shri S.C.Dabral, B.Arch. A.I.I.A.

19. Shri Rasik Bahl, B.Arch.

20. Shri V.K.Gupta, B.Arch.

Department of Town and Country Planning

1. Prof. L.R.Vagale, B.Sc. B.E. M.S.(I.I.T) U.S.A., A.M.T.P.I. F.I.T.B. A.M.A.S.E.M.A.S.P.O (on foreign service)

Professor of Planning and Head of the Department

2. Prof. G.Balakrishna Rao, B.E. (Civil) (Hons), Dip.T.C.P. Aca. Dip. T.P.(Lond.) A.I.T.P. A.M.T.P.I.

Professor of Planning and Head of the Department

3. Prof. B.N.Ghosh, B.E.D.T.R.P. (Cal.) Dip T.P.(London), A.M.T.P.I. A.I.T.P.

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Assistant Professors of Planning

4. Shri Jaswant Rai, N.D.Arch. M.L.A. (Harvard) A.I.I.A., A.I.T.P., A.S.L.A.

5. Shri B. Misra, M.A. (Geog.) Dip. T.C.P.(Hons.).

6. Shri K.B.Suri, B.A. M.A.(Econ.) M.A.(Econ.) With specialisation in Demographic Economics, Pittsburgh

7. Shri S.K.Kulshresta, B.Sc. B. Arch. Dip. T.C.P. (on foreign service)

Lecturers in Planning

8. Shri J.H.Ansari, B.Sc. Engg. (Civil) Dip. T.C.P. (Hons.) (on study abroad)

9. Shri M.N. Chatterjee, B.Arch. Dip. T.C.P., A.I.I.A.

10. Shri S.K.Sharma, B.Arch. Dip. T.C.P. (Hons.)

Department of Housing and Community Planning

1. Prof. H.P. Bahri, B.Arch. Dip. T.P.(London) A.I.I.A. , M.R.T.P.I. A.I.T.P..

Professor of Socio Economics

2. Dr. K. Raman Unni, M.A., Ph.D.

Assistant Professor of Housing

3. Shri H.S. Bakshi, B.Sc. Engg. (Civil) M.S. Engg. (Civil) (USA).

Research Associate

Neelima Risubud B.Arch. Dip. T. & CP (H.C.P.) (Hons.)

Department of Traffic and Transportation Planning

Professor of Traffic and Transportation Planning and Head of the Department

1. Prof. M.S.V. Rao, B.Sc. B.E. M.Sc. Engg. (Lond.) T.P. Dip(Lond.) A.M.T.P.I. A.I.T.P.

Professor of Traffic and Transportation Planning

2. Prof. G.M. Andavan B.E. M.Sc. Engg. (Birmingham) A.I.T.E. A.I.H.E.

Assistant Professor of Traffic and Transportation Planning

3. Shri J.K. Mittu, B.Sc. B.Sc. Engg. (Civil) Dip. T.C.P. M.Sc. (T.T.P.) (Birmingham), A.I.T.P.

Department of Landscape Architecture

Expert in Landscape Architecture and Head of the Department

1. Prof. Ravindra Bhan B. Arch. W.U. (St. Louis), M.L.A.(Penn.)

Assistant Professor of Architecture

2. Shri H.K.Dhar, B.Sc. B. Arch A.I.I.A. (on deputation abroad).

Ford Foundation Fellow

3. Mohammad Shaheer, B.Arch., Dip. Arch. (U.D.) (on study abroad)

Rural Housing Wing

Extension Officer-cum-Lecturer Architecture

1. Shri K.G.Malik, B.A. B.Arch. A.I.I.A.

Extension Officer-cum-Lecturer in Socio-Economics

2. Shri S.K. Chandoke, M.A.

Extension Officer-cum-Lecturer in Architecture

K.G.Malik, B.A. B.Arch., A.I.I.A.

ANNEXURE-III

STATEMENT SHOWING THE RESEARCH PAPERS/ARTICLES/BOOKS WRITTEN AND PUBLISHED BY THE MEMBERS OF THE FACULTY

S.No.	Title of Research Paper/ Article/Book	Name of Technical Journal in which published/name of publisher.	Month and year of publication
1	2	3	4
	1. Late Prof. T.J. Manickan		
1.	Kotla Mubarakpur, An Urban Village	Urban and Rural Planning Thought	January, 1958
2.	Planning Organisations in India.	Urban and Rural Planning Thought	July, 1959
3.	Indian City Patterns	Urban and Rural Planning Thought	July, 1960
4.	Urban and Regional Planning.	Urban and Rural Planning Thought	July, 1968
5.	Physical Planning of Industrial Estates	Urban and Rural Planning Thought	April, 1969
6.	Housing Crisis in the East	Urban and Rural Planning Thought	January, 1971
7.	Report of the Commission on Professional Education, Training and Research in Eastern Region.	Urban and Rural Planning Thought	July, 1972
8.	Trees for Landscaping	School of Planning and Architecture, New Delhi.	1968
9.	Cost of Urban Infrastructure	Standford Research Institute, California, U.S.A.	1968
	2. Prof. C.S.H. Jhabvala		
1.	Apologi for Indian Architecture	Journal of the Institute Town Planners, India	July, 1962
2.	Housing for Middle Classes	Jantar	

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1	2	3	4
	3. Prof. Ranjit Sabikhi		
1.	Delhi Scene - a centre	Design	February, 1964
2.	City without (a series of three articles)	The Statesman	May, 1964
3.	Staff Quarters for the Y.W.C.A.	Design	August, 1964
4.	Town and Cities of Rajasthan	Marg	December, 1964
5.	Students' Hostel	L'architecture D'aujourdhui	October - November, 68
6.	Architecture and Urban Affairs (a series of 16 articles)	The Hindustan Times	Nov., 1968
7.	Modern Architecture in India.	Indian and Foreign Review	December, 1968
8.	Pavilion at Indian Industries Fair	Architectural Design	March, 1969
9.	India's New Architecture	Canadian Architect	June, 1970
	4. Prof. V.P. Raori		
1.	Design of Farm Houses	Design	Nov., 1967
2.	Delhi Master Plan in Doldrums	Hindustan Times	Feb., 1972
3.	Sluggish Zonal Planning	Hindustan Times	March, 1972
4.	Time for Review	Hindustan Times	March, 1972
5.	Attend to Katras too or Delhi will go the Calcutta way.	Hindustan Times	Nov., 1972
6.	A Tenth Delhi	Hindustan Times	Jan., 1973

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1	2	3	4
	5. Prof. S.K. Naravana		
1.	Rural Housing in India	Bulletin, Central Building Research Institute, Roorkee	1954
	6. Prof. K.A. Patel		
1.	Aspects of Materials and Labour in Rural Housing	R.H.W. Newsletter	Jan., 1964
2.	Structural Conditions of Rural Houses.	R.H.W. Newsletter Urban and Rural Planning Thought	October, 1964 Jan-June, 1965
	7. Shri K.B. Singh		
1.	Story of Lalgarh	Urban and Rural Planning Thought	July, 1960
2.	Architectural Considerations in Village House Design	R.H.W. Newsletter	April, 1965
3.	Village Housing Scheme in Lalgarh - An Assessment	R.H.W. Newsletter	Jan.-June, 1967
4.	Bhawanpura Research-cum-Demonstration Project - Assessment.	R.H.W. Newsletter	Jan-June, 1967
	8. Shri Ram Sharma		
1.	Streets of New Delhi	Design	1967
2.	Landscaping New Delhi	The Statesman	1968
	9. Shri P.N. Mathur		
1.	Tourist Hostel-cum-Programme Centre for New Delhi Y.M.C.A.	Sunday Times(London)	April, 1966
2.	Cinema for N.D.M.C. at Chankyapuri	Design (Annual Number) R.I.B.A. Journal	May, 1966 March, 1967

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1	2	3	4
	10 Shri S.C. Dabral		
1.	Delhi - Chaotic City	Hindustan Times (Evening)	
2.	Book Review of 'Islamic Architecture	Democratic World	March, 1973
	11. Prof. L.R. Vagale		
1.	Kotla Mubarakpur, An Urban Village	Urban and Rural Planning Thought	January, 1958
2.	Aesthetic and Landscaping Problems of Roads	Urban and Rural Planning Thought	April, 1959
3.	Faridabad, A Critical Study of the New Town	Urban and Rural Planning Thought	July, 1959
		Ekistics	1959
4.	Industries, Employment and Urban	Journal of Institute of Town Planners, India	1959
5.	Delhi, A Study of Entertainment and Amusement Facilities	Urban and Rural Planning Thought	January, 1960
6.	Trends in Housing Needs of India	Ekistics	
		Urban and Rural Planning Thought	
		Journal of Institute of Town Planners, India	1960
7.	Bangalore, A Study of Planning Problems	Journal of Institute of Town Planners, India	1961
8.	Financing Master Plans	Journal of Institute of Town Planners, India	1961
9.	Design Element in Urban Planning	Journal of Institute of Town Planners, India	July, 1962
		Indian Builder	Dec., 1962
10.	Regional Basis for Development Planning	Urban and Rural Planning Thought	Oct., 1962

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1.	2	3	4
11.	Comparative Study of Recreational Spaces in Selected Cities of India	Journal of Institute of Town Planners, India	1962
12.	Basic Issues in Planning of Small Urban Communities and Caste Studies of a Few Towns in India.	Journal of Institute of Town Planners, India	Jan-April, 1963.
13.	Role of Town Planning in National Emergency	Journal of Institute of Town Planners, India	June, 1963
14.	Planning for Small Urban Communities in India.	Journal Ekistics	Nov., 1963
15.	Town Planning in Relation to	Journal of Institute of Town Planners, India	December, 1963
16.	Neighbourhood Planning and its relation to Housing	Urban and Rural Planning Thought.	Jan-June, 1966
		Journal of Institute of Town Planners, India	August, 1964
		Indian Builder	December, 1964
17.	Thoughts on Urban and Regional Planning Education in India.	Urban and Rural Planning Thought	Jan-June, 1966
1 .		Journal of Institute of Town Planners, India	September, 1964
18.	Cities and Industries, Impact and Relationship	Journal of Institute of Town Planners, India	March-June 1965
19.	Metropolitan Cities in India.	Journal of Institute of Town Planners, India	September, 1965
20.	Structure of Industrial Cities in India	Indian Builder	December, 1965
21.	Central Areas of Indian Cities	Journal of Institute of Town Planners, India	Dec., 1965 March, 1966
22.	Structure of Metropolitan Cities.	Urban and Rural Planning Thought	Jan-June, 1966.

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1	2	3	4
23.	Population Trends in India and Their Implication in Town Planning, Housing and Urban Development.	Journal of Institute of Town Planners, India	June-Sept. 1966
24.	New Towns in India	Journal of Institute of Town and Planners, India	Dec.1966 - March 1967
25.	Metropolitan Cities in India: Urban Development Problems and Local Administration.	Journal of Institute of Town Planners, India	June, 1967
26.	Note on the Layout of Industrial Estates in India	Journal of Institute of Town Planners, India	September, 1961
27.	Case Study of Chandigarh and Environs in the Regional Setting.	Urban and Rural Planning Thought	July-Dec.1967
28.	National Development Planning in its Relation to Urban and Regional Planning.	Journal of Institute of Town Planners, India	June, Sep.1968
29.	Rajasthan Canal Area, A Settlement Structure	Urban and Rural Planning Thought	July, 1973

12. Prof. B.N. Ghosh

1.	India 1958 - An Appraisal	Design	November, 195
2.	Central Mechanized Farm in Rajasthan	India Construction News Calcutta	March, 1959
3.	A Master Plan in Perspective	Design	November, 196
4.	Towards Total Metropolitanism	Design	June, 1961
5.		Ekistics	1961
5.	Bal Bhavan	Design	May, 1961
6.	Indian Industries Fair 1961	Design	January, 196

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1	2	3	4
7.	Central Vista	Journal of Institute of Town Planners, India	1962
8.	Calcutta	Design	February, 1963
9.	Planning and National Emergency	Journal of Institute of Town Planners, India	June, 1963
10.	Must We Wreck when We Build	Yojana	July, 1963
11.	The Master Plan of Durgapur	Design	July, 1963
12.	Temporary Construction	Journal of Institute of Town Planners, India	December, 1963
13.	The Delhi Scene, Objections and Suggestions to the proposed Municipal Bye-Laws	Design	February 1964
14.	The City Without Centre	The Statesman, New Delhi	May, 1964
15.	Philosophy and Folly of Urban Development of Chandigarh	Urban and Rural Planning Thought	July-Oct., 1964
		Economic Times, Bombay	June, 1963
16.	Planning and National Emergency	Journal of Institute of Town Planners, India	June, 1964
17.	Contact with the World	Yojana	August, 1964
18.	City Builders Need a Philosophy	Yojana	January, 1965
19.	Nayabans	Urban and Rural Planning Thought	July-Dec., 1965
20.	Palace Complex of Jaipur	Urban and Rural Planning Thought	July-Dec., 1965
21.	Le Corbusier and Contemporary Architecture	Yojana	September, 1965
22.	Town Planners are Creating Villages and not Towns	Yojana	February, 1966
23.	A Civic Centre for New Delhi	Design	July, 1966
24.	Delhi 1981 A.D., Promises for a Better City.	Shakti	1968
25.	Cities of our Making	Journal of the Indian Institute of Public Administration, New Delhi.	July-Sep., 1968
26.	Jaisalmer	Urban and Rural Planning Thought	January, 1968
27.	Delhi's Choice as Capital not on Practical Grounds.	National Herald, New Delhi	October, 1968

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1	2	3	4
28.	Physical Training of Industrial Estates.	Urban and Rural Planning Thought	April, 1969
29.	Port Towns in India	Journal of Institute of Town Planners, India	December, 1969-March, 1970
30.	Oh Calcutta	Hindustan Times Weekly Review, New Delhi.	March, 1970
		Journal of Institute of Town Planners, India	September, 1970
31.	Spatial Dimension of Urban Growth Related to Traffic and Transportation.	Urban and Rural Planning Thought	July, 1970.
32.	Sriangam: Urban Form and Pattern of an Ancient Indian Town	Urban and Rural Planning Thought	April, 1971
33.	Calcutta-Slumstadutan Framtid	Sydsvenska Dagbladet Malmo	April, 1972
34.	Environment	Shakti	November, 1972
35.	Need for Rational Approach to Rural Housing	Social Change	December, 1972
36.	Our Village Chhatera after 4 years- A new Design	Hindustan Times	February, 197
37.	Annual of Architecture, Structure and Town Planning	The Publishing Corporation of India, Calcutta.	1961
		Indian Institute of Technology, Madras	
38.	Trees for Landscaping	School of Planning and Architecture, New Delhi.	-
39.	Indian Vistas, Aspects of Change in Contemporary India	Vora and Company Publishers Private Limited, Bombay	1971
40.	Planning Rural Growth Centres for Integrated Area Development A Study in Miryalguda Taluka	National Institute of Community Development, Hyderabad	1971

13. Prof. G.B. Krishna Rao

1.	Model Town and Country Planning Act: A Critical Appraisal	Journal of All India Institute of Local Self-Government, Bombay.	July-Sep., 1

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1	2	3	4
2.	Wheels within Wheels	Eastern Economists	May, 1970
3.	Building Rules: Their nature and purpose	Nagarlok	July-Sep., 1972
4.	Development Control in Indian City	Urban and Rural Planning Thought	April, 1973
	14. Shri Jatwant Rai		
1.	Emerging Physical Urban Pattern of Towns and Cities	Journal of Institute of Town Planners, India	Jan-April, 1963
	15. Shri B. Misra		
1.	Optimum Size for Indian City	Urban and Rural Planning Thought	July-Dec., 1967
2.	Urban and Regional Planning	Urban and Rural Planning Thought	July, 1968
3.	Tourism in the Region of other Tajmahal.	Journal of Institute of Town Planners, India	Dec., 1970
4.	Growth Pole and Growth Centre strategy in Metropolitan Regional Development.	Indian Journal of Regional Science	1971
5.	Growth Pole Concept, its Applicability to Regional Development.	Urban and Rural Planning Thought	January, 1972
6.	Application of Growth Pole Concept to the Development of National Capital Region	Urban and Rural	April, 1972
	16. Shri K.B. Suri		
1.	Impact of Expanding Metropolis Bangalore	Economic and Political Weekly	January, 1970
2.	Growth of Small Towns in Gujarat	Economic and Political Weekly	January, 1972
	17. Shri S.K. Kulshrestha		
1.	Land Use Pattern of Urban Centres of India.	Urban and Rural Planning Thought	October, 1968
2.	Image of Delhi-Capital of India	Journal of Institute of Town Planners, India	March, 1969
3.	Development Plan for Chattera Village.	Urban and Rural Planning Thought	July, 1973

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1	2	3	4
	18. Prof. D.V.R. Rao		
1.	Housing in the National Capital	Journal of the Institute of Town Planners, India	March, 1969
2.	Rehousing of Squatters- a Case Study in Delhi.	Urban and Rural Planning Thought	October, 1972
3.	An Urban Renewal Study of Motia Khan- Delhi.	Urban and Rural Planning Thought	October, 1972
4.	Housing of Squatters in Delhi- A search for Solution	Urban and Rural Thought	April, 1973
	19. Dr. K.R. Unni		
1.	Visiting Husbands in Malabar	Journal of the M.S. University of Baroda	March, 1956
2.	Polyandry in Malabar (Part I)	Indian Sociological Bulletin	September, 195
3.	Polyandry in Malabar (Part II)	Indian Sociological Bulletin	October, 1958
4.	A Note on Rural Family Types	R.H.W. News Letter, School of Planning and Architecture	1962
5.	Rurban Villages-Aspects of Planning	R.H.W. News Letter, Bangalore Engineering College (Special Issue)	April, 1964
6.	Rural Housing Cooperatives	R.H.W. News Letter, School of Planning and Architecture	1964
7.	Aspects of Materials and Labour in Rural Housing.	R.H.W. News Letter School of Planning and Architecture	January, 196
8.	Rural House Types	Urban and Rural Planning Thought	June, 1965.
9.	The Rural Habitat	School of Planning and Architecture	April, 1965
10.	Social Considerations in Rural House Design	R.H.W. News Letter, School of Planning and Architecture	1965
11.	The Idea of Group Housing	R.H.W. News Letter, School of Planning and Architecture	1965

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1	2	3	4
12.	Scope for extension work in Rural Housing	R.H.W. News Letter, School of Planning and Architecture.	1965
13.	Structural Conditions of Rural Houses-Some Social Aspects.	Urban and Rural Planning Thought	June, 1965
14.	A Review Article on Settlement and social Change in Asia.	Indian Economic and Social History Review	March, 1969
15.	Toward Comprehending Kerala-Some Social Perspectives for the Planning of Settlements.	Urban and Rural Planning Thought	December, 1969
16.	Benefits of Housing Management	Urban and Rural Planning Thought	June, 1970
17.	Housing Management	Urban and Rural Planning Thought	June, 1970
18.	Housing Management- A note on Role Orientations of the Profession	Urban and Rural Planning Thought	June, 1970
19.	Methods of Housing Management	Urban and Rural Planning Thought	June, 1970
20.	Sociology of Housing	Urban and Rural Planning Thought	January, 1973
21.	Anthropological and Sociological Research in Kerala-Past Achievements and Future Prospects- A Review	Research Abstracts Quarterly of the Indian Council of Social Science Research	April, 1973
	20. Prof. H.P. Bahri		
1.	National Emergency and Safety of Life in Central City Areas	Journal of Institute of Town Planners, India	December, 1963
2.	Traditional Housing Study in India-I	Urban and Rural Planning Thought.	January, 1971
3.	Traditional Housing Study in India-II	Urban and Rural Planning Thought.	July, 1971
4.	Urban Renewal Study of Motia Khan	Urban and Rural Planning Thought.	October, 1972
	21. Prof. H.S. Bakshi		
1.	Research and Documentation in Buildings.	National Buildings Organisation	1970

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1	2	3	4
	22. Prof. M.S.V. Rao		
1.	A Study of some aspects of Road Users Behaviour and accidents in Delhi.	Journal of Indian Road Congress	-
2.	Aerial Surveying Techniques and their application to Town and Country Planning.	Urban and Rural	October, 1958
3.	Faridabad-A critical Study of the New Town	Urban and Rural Planning Thought	July, 1959
4.	Circulation and Urban Development	Journal of the Institute of Town Planners, India	April, 1959
5.	New Towns in India(Public Administration Problems on New and Rapidly Growing Towns in Southern Asia.	United Nations	1960
6.	Use of Analytical Technique in the preparation of Traffic and Transportation Plan for Calcutta Metropolitan District.	Institute of Town Planners, India	1967
7.	Comprehensive Traffic and Transportation Plan for Calcutta Metropolitan District.	Published by West Bengal Government	October, 1967
8.	Calcutta Plans Ahead	Journal of Institute of Traffic Engineers, USA	June, 1968
9.	Mass Transportation with particular reference to Bus Transport.	Journal of the Institute of Towns Planners, India	1969
	23. Prof. J.K. Mittu		
1.	Urban Infections and Renewal	Civic Affairs, Kanpur	February, 1967
2.	Road Transport Industry in India	Civic Affairs, Kanpur	July, 1968
3.	Traffic Planning Consideration for Indian Cities.	Civic Affairs, Kanpur	August, 1968
4.	Physical Planning of Industrial Estates.	Urban and Rural Planning Thought	May, 1970

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1	2	3	4
		24. Prof. Ravinder Bhan	
1.	Ecological Planning in India	Extracts Published in International Centre.	June, 1973
		25. Shri S.K. Chandhoke	
1.	Village Housing Schemein Lalgarh-An assessment	Rural Housing Wing News Letter	December, 1966
2.	Bhawanpura Research-cum-Demonstration Project-An Assessment	Rural Housing Wing News Letter	June, 1967
3.	The Tana Bhagats (A Religious Reformation Movement)	Vanyajati	July, 1971
4.	Tana Bhagats (7 printed pages included in the Book "Tribal Revolts" by V. Raghavaiah	Andhra Rashtra Adim Jati Sewak Sang	1971
5.	The Tribes of India	Bhartiya Adim Jati Sewak Sngh	1972
6.	The Tana Bhagats of Chota Nagpur.	Vana Jati	October, 197?

ANNEXURE-IV

(72)

University Grants Commission
Bahadur Shah Zafar Marg
New Delhi.

The guidelines laid down by the Commission for considering proposals for declaring an Institution as deemed to be a University under Section 3 of UGC Act.

1. Section 3 of the UGC Act provides for declaring an institution of higher education other than a University to be 'deemed to be a University' and when such an institution is deemed as a University, the UGC Act applies to it, as a University within the meaning of Section 2(f) of the Act.

2. This provision has been made in the Act to bring under the purview of the University Grants Commission institutions which for historical and other reasons are not universities and yet are doing work of a high standard in an academic field and at University level, and that granting of the status of deemed to be a university would enable them to develop ideals belonging to the higher Education and Research.

3. Keeping in view the general concept of an institution to be deemed to be a university, the institution should generally aim at strengthening its activities in the field of specialisation rather than make efforts towards growing into multi-faculty university of the general type.

4. The type of institution that may be recognised as 'deemed to be University', should generally be (i) an institution, engaged in teaching and research in chosen fields of specialisation and has maintained the highest academic standards, (ii) in the fields of its specialisation, the institution has a very high standard, is making a distinct constibution to university educational system, and by bringing it under the UGC Act, the University system would be enriched(iii) the granting of a deemed university status would further enhance the development of the area of specialisaion, teaching and research activities, in that institution. (iv) the institution has the necessary financial resources and viability and a mzanagement capable of contributing to university ideals and traditions.

ANNEXURE V

(73)

SCHOOL OF PLANNING AND ARCHITECTURE
NEW DELHI-I

REVISED ESTIMATES FOR 1974-75 AND
BUDGET ESTIMATES FOR 1975-76.

Sl. No.	Primary Unit/ Detailed Head	Revised Estimates 1974-75	Budget Estimates 1975-76.	Budget Provision approved by the Government of India
1	2	3	4	5
A.	RECURRING			
1.	Pay of Officers (Including part-time Officers)	8.79	11.29	10.06
2.	Pay of Establishment	4.55	5.08	4.71
3.	Allowances and Honoraria			
	i) Dearness Allowance	3.17	3.61	2.96
	ii) T.R.A. and C.C.A.	2.48	3.20	2.75
	iii) Other Allowances & Honoraria	0.45	0.50	0.50
	iv) T.A. and H.T.C.	0.40	0.45	0.45
4.	Interim Relief	0.34	0.56	0.32
5.	C.G.H.S. Contribution	0.32	0.44	0.37
6.	C.P. Fund Contribution and interest thereon	1.97	2.70	2.47
7.	Scholarships, Fellowships, Prizes and Medals.	1.50	2.00	2.00
8.	Remuneration to paper Setters and Examiners.	0.22	0.22	0.22
		24.19	30.05	26.81
9.	Other Charges:			
	i) Office Stationery, Duplicating Materials, Electrical goods, Drawing Stationery, Sports goods & Charges.	0.77	0.84	0.77
	ii) Consumable articles for laboratories Workshop, Art & Audio-Visuals.	0.22	0.25	0.22
	iii) Misc. & Contingencies such as Postages, Telephones, Liveries, Advertisement etc.	1.10	1.30	1.10

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iv)	Books, Magazines & Publications	0.94	1.00	0.94
v)	Rent, Rates and Taxes	1.54	1.80	1.54
vi)	Repairs & Maintenance of Buildings, Gardens, Equipments, Furniture & Fixture.	0.72	0.80	0.72
vii)	Running & Maintenance of Staff Car	0.22	0.22	0.22
viii)	Printing and Publication	0.49	0.54	0.49
ix)	Seminars, Exhibitions & Models and Short-term Courses	0.16	0.16	0.16
x)	Advance to Staff	0.44	0.45	0.44
		6.60	7.36	6.60
	Total (A)	30.79	36.34	33.41
			Less (%	3.01
				30.40

B. NON-RECURRING

1. Building	1.72	9.00	3.00
2. Furniture	0.60	0.80	0.80
3. Equipment	0.90	1.20	1.20
Total (B)	3.22	11.00	5.00
Total (A+B)	34.01	47.34	35.40

C. PLAN AND NON-PLAN GRANT-IN-AID

	Revised Estimates for 1974-75			Budget Estimates for 1975-76			Budget Provision approved the Gover of India.	
	Plan	Non Plan	Total	Plan	Non Plan	Total	Plan	Non Pla
Recurring	0.62	27.60	28.22	4.00	30.40	34.54	-	30.4
Non-Recurring	3.22	-	3.22	11.00	-	11.00	5.00	-
		27.60	31.44	15.00	30.54	45.54	5.00	30.4
	3.84							

Annexure-VI

Composition of the Board of Governors of the School of Planning & Architecture.

The Board shall be composed of:-

1.	Chairman of the Socity	Chairman
2.	Director of the Institute(ex-offico)	Member
3.	Two members of the Society representing the Ministries of the Government of India, dealing with Finance and Technical Education.	Member
4.		
5.	Member of the Society representing the Institute of Town Planners, India	Member
6.	Member of the Society representing the Indian Institute of Architects	Member
7.	Member of the Society representing the Insitution of Engineers (India)	Member
8.	Member of the Society representing the Indian Sociological Society	Member
9.	Member of the Society representing the the Association of Indian Geographers	Member
10.	Member of the Society representing the Indian Economic Association	Member
11.	One representative of the All India Council for Technical Education	Member
12.	Three persons, from amongst the educationists of repute/eminent professional men, in the field of environmental studies, who are not in the service of the Institute, nomiated by the Government of India, in consultation with the Director of the Insititute	Member
13		
14		
15	Two members of the Faculty of the Institute, appointed by the Senate	Member
16		

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UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976.

Item No. 11 To consider the report of the committee appointed by the UGC to assess the programme of continuing education at Saurashtra University, Rajkot.

.....

The University Grants Commission appointed a committee, consisting of the following members, to assess the needs and requirements of the Saurashtra University, Rajkot towards the establishment of a centre of continuing education in the fifth plan period.

1. Dr. M.N. Palsane
   Honorary Director
   Centre of Continuing Education
   Poona University
   Poona.

2. Smt. Kamalini H. Bhansali
   Registrar
   SNDT Women's University
   Bombay.

3. Dr. S.C. Goel
   Deputy Secretary
   UGC, New Delhi.

2. The Committee visited the Saurashtra University on March 15-16, 1976 and held discussions with Prof. Harsukhbhai Sanghvi, Vice-Chancellor, Dr. G.P. Bhatt, Pro-Vice-Chancellor, Heads of departments and principals of colleges, leading citizens, eminent public men and representatives of the community at Rajkot and Bhavnagar (Rajkot March 15, and Bhavnagar March16, 1976.

3. The report and recommendations of the committee are attached (Annexure). The main recommendations and observations are summarised below:-

i) The university, on its own, developed certain programmes of continuing education th rough its extra mural board. These programmes include extension lectures for the rural com unity, village leadership development programmes for training panchayat sarpanches and other members of the rural community, extension education for the training of farmers and general purpose courses. Two institutions viz Lok Seva Mahavidyalaya at San osara and Darbar Gopaldas Mahavidyalaya at Alibada both affiliated to the Saurashtra University, undertake a variety of programmes for the integrated development of the rural community.

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ii) The committee was of the view that the university should safeguard against venturing out into areas in which other agencies may be functioning more successfully and should concentrate as far as possible, on areas in which it can make an impact and offer something unique and distinctive.

iii) Some of the priority areas would be programmes geared towards the rural community e.g. farmers, village panchayat leaders, block development officers, etc and the industrial workers, trade union leaders, professional groups etc in the urban areas.

iv) The first step is to determine the priority areas keeping in view the interest of the university departments and then to assess the needs of the community and to design the programmes, contents and methodology to suit those particular needs.

v) In identifying the needs of the community and in the conduct of the programmes, it is of the utmost importance that the concerned university departments are fully involved and assistance is sought from voluntary agencies and other governmental and semi-governmental institutions already working in the field.

vi) Instead of diversifying its activities and resources over a wide range of activities, the university should make a modest but firm beginning. The programmes could be extended and intensified in the light of experience, achievements and the response of the community.

vii) There should be a separate centre responsible for the various activities with a good deal of flexibility and functional autonomy. The centre should be directly responsible to the Vice-Chancellor.

viii) The university may offer courses of a credit or non-credit nature but there will be many advantages in concentrating efforts in the initial phase, on non-credit courses.

ix) For better organisation, two committees should be formed. One of the committees may consist of academicians and representatives of the community for overall planning and policy. There may also be committee for each of the programmes to assist the formulation and conduct of the programme in the initial stages.

4. In the light of the objectives, scope and priorities of the continuing education programmes as spelt out above, The university agreed to reformulate its scheme and submitted the following conctete proposals:

i) Short courses and extension lectures on subjects like labour and industrial lawas, taxation laws, management of small industries, entrepreneurship, salesmanship, improvement of English, science in every day life, office adminstration, library science, journalism etc for urban areas.

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ii) Short-term courses and extension lectures on subjects like agricultural technology, rural leadership, panchayat administration, land legislation, family planning and population education, rural health, hygiene and sanitation, cottage industries etc for rural areas.

iii) General purpose courses on subjects like nutrition, family welfare, child guidance, music, health education, civic education etc.

5. The committee recommends the schemes proposed by the university for financial support by the UGC. It would further like to suggest that in the initial stages only a few programmes should be undertaken after ascertaining the needs of the community. The core staff recommended by the committee may be located at Rajkot but the programmes should be undertaken at both the campuses viz Rajkot and Bhavnagar. *

6. The committee recommends the following facilities for the establishment of a Centre of Continuing Education at Saurashtra University:

Staff	Expenditure in Rs. p.a.
i) Director of the Centre (Honorary) Rs. 250/- p.m.,	Rs. 3,000
ii) Co-ordinator (Rs.1100-1600)- Revised	Rs.18,000
iii) Programme Officer (Rs.700-1300)-Revised	Rs.14,000
iv) Accountant-cum-clerk(265-465)	Rs. 6,000
v) Typist (Rs. 265-465)	Rs. 6,000
vi) Messenger (Rs.110-170)	Rs. 3,000

Expenditure on programmes (including honorarium to resource persons, TA and DA, remuneration to part-time assistants, etc. Books and Journals, Publication, nisceallaneous expenditure e.g. Publicity, stationery, postage, electricity etc).

a)	Rajkot Campus	Rs.25,000
b)	Bhavnagar Campus	Rs.25,000

* Dr. M.N. Palsane, while approving the report has suggested that out of the two posts viz of co-ordinator and the programme officer, one may be located at Bhavnagar and that a sum of Rs. 3,000 p.a. may be provided for part-time assistant at Bhavnagar campus.

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Non-recurring expenditure

(Equipment, Furniture etc.) Rs. 20,000/-

Total expenditure for three years i.e. 1976-77, 1977-78 and 1978-79 = Rs. 3,20,000/-

University Grants Commission Share at 75 per cent=Rs.2, 40,000

The matter is placed before the Commission for consideration.

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Annexure to the item No. 11.

Report of the committee appointed by the UGC to assessthe programme of continuing education at Saurashtra University, Rajkot,

.....

The University Grants Commission appointed a committee, consisiting of the following members, to assess the needs and requirements of the Saurashtra University, Rajkot towards the establishment of centre of continuing education in the fifth plan period.

1. Dr. M.N. Palsane
   Honorary Director
   Centre of Continuing Education
   Poona University
   Poona.

2. Smt. Kamalini H. Bhansali
   Registrar
   SNDT Women's University
   Bombay.

3. Dr. S.C. Goel
   Deputy Secretary
   University Grants Commission.

2. The committee visited the Saurashtra University on March 15-16, 1976 and held discussions with Prof. Harsukhbhai Sanghvi, Vice-Chancellor, Dr. G.P. Bhatt, Pro- Vice-Chancellor, Heads of departments and principals of colleges, leading citizens, eminent public men and representatives of the community at Rajkot and Bhavnagar. (Rajkot March 15, and Bhavnagar March 16, 1976)

The recommendations of the committee follow :

3(a) The Saurashtra University was established on 23rd May 1967 but the Act of the university was amended in November 1969 which brought into being two campuses, one at Rajkot and the other at Bhavnagar. The university has four regular departments, two of these (Bio-sciences and Gujarati) are at Bhavnagar. The postgraduate centres in economics, sociology and commerce are manned by one reader each, the one in education by two readers, the one in history by one reader and one lecturer and so the postgraduate centres have to lean heavily on staff from the local colleges. The jurisdiction of the university extends over six revenue districts namely, Amreli, Bhavnagar, Jamnagar, Junagadh, Rajkot and Surendranagar. There are about 57 colleges affiliated to the university with a total enrolment of 42,000. The total number of postgraduate students at the university departments/centres is about 676. The sanctioned

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teaching staff at the department/centres consists of three professors, 14 readers and 10 lecturers.

(b) The unversity, on its own, developed certain programmes of continuing education through its extra mural board. These programmes include extension lectures for the rural community, village leadership development programmes for trainin panchayat sarpanches and other members of the rural community extension education for the training of farmers and general purposes courses. Two institutions viz Lok Seva Mahavidyalaya at Sanosara and Darbar Gopaldas Mahavidyalaya at Amreli both affiliated to the Saurashtra University, undertake a variety of programmes for the integrated development of the rural community.

(c) The Syndicate of the University has decided to establish a Centre for Continuing Education within the framework of the objectives laid down by the University Grants Commission. Accordingly, the university initially proposed to undertake the following programmes.

(i) Extension lectures by specialists on a variety of subjects, social, literary, scientific etc., to provide the benefit of libral education to widen the mental horizons of the community.

(ii) Short term courses for special groups including the alumni and refresher courses, summer schools or regular credit and non-credit correspondence and evening course. The courses may be in the form ofa certificate or a diploma and may be of short or long duration.

(iii) Providing means for discussion groups, seminars, study circles etc.

(iv) Assisting persons who have had to discontinue their studies to enable them to take advantage of advances in knowledge.

(v) Programmes for the rural community.

(vi) Adult literacy programmes and

(vii) Research activities.

(d) In its discussion with the vice-chancellor, pro-vice-chancellor, heads of departments, principals of colleges and the local citizens, the committee emphasized the following essential features of the scheme of continuing education in relation to the programmes proposed to be undertaken by the university.

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i) Though universities are maintained by the Community, they have, by and large, remained isolated from the main stream of national life and problems of the community. Now that there is a more realistic awareness of the role of university in continuing education, universities should select the programmes carefully, keeping in viewthe scope and priorities and their own specialised knowledge, expertise and leadership.

ii) The university should safeguard against venturing out into areas in which other agencies may be functioning more sucessfully and should concentrate, as far as possible, on areas in which it can make an impact and offer something unique and distinctive.

iii) In view of what hasbeen stated under (ii) above, the role of the university in regard to adult literacy will be essentially limited. The university can prepare instructional material for literates and neo-literates, train adult literacy workers, evaluate the on-going programmes and help the agencies already working in the field. Some adult literacy work could also be taken up in one or two centres to the extent that it subserves the underlying objectives.

iv) Some of the Priority areas would be programmes geared towards the rural community e.g. farmers, village panchayat leaders, block development officers, etc and the industrial workers, trade union leaders, professional groups etc in the urban areas.

v) The first step is to determine the priority areas keeping in view the interest of the university departments and then to assess the needs of the community and to design the programmes, contents and methodology to suit those part icular needs.

vi) In identifying the needs of the community and in the conduct of the programmes, it is of the utmost importance that the concerned university departments are fully involved and assistance is sought from voluntary agencies and other governmental and semi-governmental institutions already working in the field.

vii) Instead of diversifying its activities and resources over a wide range of activities, the university should make a modest but firm beginning. The programmes could be extended and intensified in the light of experience, achievements and the response of the community.

viii) There should be a separate centre responsible for the various activities with a good deal of flexibility and functional autonomy. The centre should be directly responsible to the Vice-Chancellor. It should have flexibility specially in relation to accounting procedures. Norms for this purpose could be laid down by the Advisory Committee and approved by the university bodies to enable the centre to carry on its activities without delay or hindrance.

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ix) The university may offer courses of a credit or non-credit nature but there will be many advantages in concentrating efforts in the initial phase, on non-credit courses. Experience has shown that if the needs of the community are identified properly, the community is interested more in the acquisition of knowledge and skills rather than in certificates and diploms. It has also been noted that the requirements of credit courses often tend to be so rigorous that the various occupational and other groups find it difficult to meet them.

x) For better organisation, two committees should be formed. One of the committees may consist of academicians and representatives of the community for overall planning and policy. There may also be a committee for each of the programmes to assist the formulation and conduct of the programme in the initial stages.

xi) The possibility of financing the programme through fees, howsoever small, should be fully explored. This has the advantage of getting the better-motivated persons enrolled in the courses.

xii) Lectures, discussions classes, seminars, audio-visual aids etc. could all be used with advantage in programmes of continuing education, but the key word here should be flexibility in relation to the resources of the university and the needs of the community.

4. In the light of the objectives, scope and priorities of the continuing education programme as spelt out above, the university agreed to reformulate its scheme and submitted the following concerte proposals:

i) Short courses and extension lectures on subjects like labour and industrial laws, taxation lawas, management of small industries, entrepreneurship, salesmanship, improvement of English, science in every day life, office administration, library science, journalism etc for urban areas.

ii) Short-term courses and extension lectures on subjects like agricultural technology, rural leadership, panchayat administration, land legislation, family planning and population education, rural health, hygine and sanitation, cottage industries etc for rural areas.

iii) General purpose courses on subjects like nutrition, family welfare, child guidance, music, health education, civic education etc.

5. The committee agrees with the general approach of the university in the area of continuing education as detailed in para 4. It would, however, like to suggest that in the initial stages only a few programmes should be undertaken and that too after ascertaining the needs of the community through surveys, interviews, questionnaire studies, personal contact with individuals and agencies etc. The programmes should be finally selected on the basis of the recommendations of the Advisory Committee to be set up by the university. The core staff recommended by the committee under paragraph (6) may be located at Rajkot but the programmes should be undertaken at both the campuses viz Rajkot and Bhavnagar. This is

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important in view of the keen interst and aspirations of the citizens of Bhavnagar as manifest in the memorandum submitted by them to the committee. Bhavnagar has three university run colleges, two departments and several postgraduate Centres. Bhavnagar also has a polytechnic Institute, a productivity centre and Lok Bharati Campus at Sanosara besides many industries, commercial enterprises and several social and cultural groups. Smt. NGC. Gandi Mahila College, Bhavnagar affiliated to the SNDT Women's University, has already prepared a suitable ground for continuing education for women in Bhavnagar and nearby rural areas. All these potentialities can be utilised if the programmes are shared between Rajkot and Bhavnagar and the core staff at Rajkot co-ordinates the activities at both the campuses.

6. The committee recommends the following facilities for the establishment of a Centre of Continuing Education at Saurashtra University.

	Staff	Expenditure in Rs. p.a.
i)	Director of the Centre.(Honorary)	Rs.250/- p.m. Rs. 3,000
ii)	Co-ordinator (Rs. 1100-1600)	Rs. 18,000
iii)	Programme Officer (Rs. 700-1300)	Rs. 14,000
iv)	Accountant-cum-clerk (265-465)	Rs. 6,000
v)	Typist (Rs. 265-465)	Rs. 6,000
vi)	Messanger (Rs. 110-170)	Rs. 3,000

Expenditure on programmes (including honorarium to resource persons, TA and DA, remuneration to part-time assistants, etc. Books and Journals, Publication, miscellaneous expenditure e.g. publicity, stationery, postage electricity etc.)

a) Rajkot Campus	Rs. 25,000
b) Bhavnagar Campus	Rs. 25,000

Non-recurring expenditure

(Equipment, Furniture etc.)	Rs. 20,000

Total expenditure for three years i.e. 1976-77, 1977-78 and 1978-79 = Rs. 3,20,000

UGC Share at 75 per cent = Rs. 2,40,000

The committee is grateful to the Vice-Chancellor, Pro-Vice-Chancellor, university authorities, members of the academic community and the citizens of Rajkot and Bhavnagar for their help and cooperation its work.

CONFIDENTIAL

(85)

UNIVERSITY GRANTS COMMISSION

Meeting :

Dated 29th April, 1976.

Item No.12 : To consider the recommendations of the Committee appointed by the Commission to examine the Computer requirements of Annamalai University.

....

The Commission at its meeting held on 9th September, 1974 (Item No,9) while accepting the recommendations of the Standing Committee on computer development decided that the Expert Committee may be appointed to examine the proposal received from Annamalai University for the development of computer facilities. As decided by the Commission Prof. H.N. Mahabala, I.I.T., Madras was requested to visit Annamalai University and examine the proposel. Prof. Mahabala visited Annamalai University on 27th Jan, 1976 and had detailed discussions with the concerned university teachers. The report submitted by him is attached as Annexure I. It has been recommended that computer of the level of TDC-316 being manufactured by ECIL, Hyderabad would meet the needs of the university, for academic purposes. The financial implications of the recommendations of the committee for the purchase of TDC-316 computer, as per configuration indicated, would be as follows :-

1. Non recurring

   a) TDC system including taxes about Rs.27.6 lakhs

   b) Auxilliary equipment and building modifications etc. Rs. 2.0 lakhs

2. Recurring (to be provided on net deficit basis)

   a) Staff as per general norms to be prescribed.

   b) Stationery = Rs. 75,000/-

   c) Maintenance = Rs. One lakh

It may be mentioned that the Standing Committee on computer development at its last meeting decided that specific norms may be laid down for recurring assistance to be provided for various types of computers in the universities. These are being prepared by the Committee.

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In the mean while the Commission may accept theirecommendations of the committee and agree to provide grant of about ₹30 lakhs for purchase of TDC-316 computer and auxilliary equipment and installation building modifications etc. The question of recurring assistance to be provided to the Centre could be taken up later on, on the basis of norms which would be laid down by the Standing Committee.

₹ Rs.

The proposal is placed before the Commission for consideration.

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Annexure toItem No. 12

REPORT ON PROPOSAL BY ANNAMALAI UNIVERSITY FOR ESTABLISHING A COMPUTER CENTRE

H.N. MAHABALA
Computer Centre,
Indian Institute of Technology,
MADRAS.

Date Visited : 27 January 1976.

Program of Visit:

UGC team (one-man) had detailed discussion with Dr. S.M.Lakshmanan Dean of Engineering and Professor Balasundaram, Head of the department of Electrical Engineering. Faculty groups from various departments interested in using the Computer were interviewed and their needs were elicited. The space allocated for locating the computer was inspected.

Previous Computer Usage:

University has been using computer for research and student training in the last two years to the extent of about 350 hour on machines in the class of IBM/1620/1130 and about 10 hours on 360/370 systems. Since there was no allocation in budget and also difficulty of access prevented them using the system to the extent their research work needed. Finding funds for travel and stay was also a big problem. It is creditable that hands-on Computer training at the Guindy Engineering College Computer has been incorporated into the B.E. Curriculum inspite of the budget problems. Research problems have been deliberately kept small so that the free time available on the IBM 1620 at the Guindy Computer Centre would be adequate.

Assesment of future computing needs:

Any forcasting in estimation of Computing needs is bound to prove pessimistic. Experience elsewhere shows that once a system is available on the Campus valuable work gets initiated and usage builds up at an extremely fast rate. There are enough faculty and students with adequate experience in computing to lead Computer Oriented work. University has plans to include computer training for all engineering students. Department of Agriculture and Economics have valuable data which needs to be fully analysed. Once the computing capability is added many more sponsored projects will be funded in these departments. Neyveli Li gnite Corporation is interested in using the system.

Contd ...2/-

Recommendations:-

1. The space allocated for locating the computer and associated staff and key punches is ideally suited for the purpose. Funds should be provided to Aircondition the area put some partitions and construct a false floor. Dr. Mahabala has suggested to them a low-cost design for the false flooring which will cut down costs without sacrificing functional requirements.

2. University is ready for installation of a system in the class of TDC-316 which they can utilise fully. Since the department of electrical engineering is giving leadership in establishing the computer Centre, maintainance of the system will not be a problem. The configuration recommended is indicated in Appendix.I Cost involved is indicated in Appendix II. System as recommended is adequate only for R&D and academic needs and the unive sity may be asked to augment the same through other sources if they want to encourage outside usage and take-up university administrative and examination Data Processing.

3. Equipment requested but do not fall under the category of normal computer centre equipments have not been recommended.

APPENDIX I

I. TDC- 316 System with

1. 28 kore memoray.
2. ASR-35 Teletype Writer
3. 400 c.p.m. card reader
4. 300 c.p.m. line printer
5. Two 9-track, 800 b.p.i. tape transparts.
6. One 7.25 MB Diskdrive
7. 50 tapes (2400 feet)
8. 5 Disk packs
9. Three card punches
10. One card verifier

II. Auxilliary equipment

1. Voltage stabilizers
2. Airconditioning plant (about 10 ton)

III. Staff:

1. Deputy Director (Reader Scale)	- One
2. Senior Programmer /analyst (Reader Scale)	- One
3. Maintainance Engineer(Lecturer (Scale)	- One
4. Programmers (Lecturer scale)	- Two
5.	

Contd....3/-

5. Console Operator (S.T.A.level)* Three

6. Punch card operators (L.D.C. - Scale) : Two

APPENDIX II

Estimated budget

I. Non recurring

a) TDC system 23.6 lakhs

Taxes if applicable 4.0 lakhs

b) Auxilliary Equipment and building modification . . . . 2.0 lakhs

Recurring (to be provided on Deficit make-up basis)

a) Staff - as per U.G.C. norms.

b) Stationery- Rs. 75,000/-

c) Maintainance-Rs.1,00,000/-

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CONFIDENTIAL

UNIVERSITY GRANTS COMMISSION

(40)

Meeting :

Dated : 29th April, 1976.

Item No. 13 : To consider the report of the Expert Committee appointed by the Commission to examine the proposal of M.S. University of Baroda for development of computer facilities.

.....

A proposal was received in 1972 from the M.S. University of Baroda for the purchase of a computer. The proposal was examined in consultation with the department of electronics and accepted in Principle by the University Grants Commission Standing Committee on computer development. The University was then requested to reformulate its proposal keeping in view the suggestions made. On receipt of the revised proposal it was decided that an expert Committee/consisting of following members visited M.S. University of Baroda on 13th/14th March, 1976:

1. Prof. H.N. Mahabala, I.I.T., Madras.
2. Major Thiagarajan, Electronic Commission, New Delhi
3. Dr. D.Shankar Narayan, Addl. Secretary, University Grants Commission.

The Committee had detailed discussions with the Vice-Chancellor Deans of the concerned Faculties and other teachers involved. The Committee examined the requirements of computer facility in the university in the light of actual computer utilization at present, the nature of research programmes undertaken by different departments and level of computer usage and existing computer capabilities of the faculty.

The main recommendations of the committee are as follows :

1. The Committee recognised a fully justified need for the development of computer centre in the Baroda university. The Computer Centre should be equiped with a medium size computer system which could be developed in two phases over a period of 5 years.

2. The computer system with configuration suggested would cost about Rs. 30 to 32 lakhs in phase - I and Rs.5 lakhs in phase - II.

3. The Commission may provide grants not exceeding Rs. 3 lakhs for building of the computer centre and air - conditioning and installation of computer.

Contd....2/-

4. The Commission may provide necessary assistance for personnel requirements and also maintenance of the computer system on the basis of norms to be worked out by the University Grants Commission Standing Committee, and on a net deficit basis.

5. The requirement for non-academic and non-technical staff should be met by the university from within its normal maintenance budget.

6. The computer Centre when developed may have other non university users. This would help the computer centre becoming self-sufficient within a short period.

7. It would be desirable to set aside about 10 to 15% of the earnings of the computer for building capital fund for future growth of the computer system.

8. The requirements of the university of academic staff for computer science courses may be met from V plan grants.

9. The Committee has also recommended that until such time the university establishes its own computer centre the Commission may provide annual grant not exceeding Rs. 50,000/ for purchase of computer time from other computer centres for the research programmes of the university.

The report of the Committee is attached as Annexure I. A statement indicating present position of development of computer facilitie in the Universities is also included as Annexure II.

The financial implications of the recommendations of the committee are as follows :-

Non recurring :

1. Computer phase I = Rs. 30 to 32 lakhs *
   Phase II = Rs. 5 lakhs
2.
2. Building including air-conditioning and installation of computers = Rs. 3 lakhs

(* actual cost to be determined on basis of purchase made as per suggested configuration plus taxes etc.)

Contd...3/-

Recurring

1. Rs. 50,000/- per annum for purchase of computer time until the computer centre is established.

2. Other recurring assistance to be provided on net deficit basis according to the norms to be determined by the U.G.C. Committee on computer development.

The matter is placed before the Commission for consideration.

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Annexure to Item No. 13 (13)

Report of the Expert Committee appointed to examine the proposal of the M.S. University of Baroda for development of computer facilities.

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The M.S. University of Baroda, earlier in 1972, proposed to set up a Computer Centre by purchase of a suitable computer system required for its research and training programmes. This proposal was initially examined with the help of the Electronics Commission and was considered later and accepted in Principle by the Standing Committee of the University Grants Commission for development of computer facilities in the universities during Fifth Plan period. In accordance with the suggestions made by the Standing Committee, the Commission appointed an expert Committee consisting of the following members to visit the Baroda University to examine the detailed proposal in this regard and make necessary recommendations to the University Grants Commission :-

(1) ½ Professor H.N. Mahabala,
Head of the Computer Centre,
Indian Institute of Technology,
Madras.

(2) Major T. Jagarajan,
I.P.A.G.
Electronics Commission,
Government of India,
New Delhi.

(3) Dr. D. Shankar Narayan,
Additional Secretary,
University Grants Commission.

The Committee visited Baroda University on 13/14th March 1976. The University had submitted prior to the visit of the Committed a detailed proposal giving information with regard to the various activities of teaching, research and educational adminstration where computer needs have been felt, and justifying the need for development of a Computer Centre.

During its visit, the Committee examined the proposal by holding discussions with the Vice-Chancellor and other university authorities, Deans of the faculties concerned and other major users of computer facilities in the different faculties. The Committee obtained an idea with regard to the present level of computer capability, on-going teaching and research programmes requiring computer use and also the projected needs for the next few years. The Committee took into account the follwing criteria in evaluating the University's proposal : (i) Use of computer facility for different purposes, such as, teaching and

Contd..... 2/-

and training, scientific research, consultancy on regional and also on national basis, educational adminstration (e.g. admissions, examination results and accounting purposes etc.) (ii) extent of computer use already made by obtaining computer time from computer available in the neighbourhood and the amount spent on hiring such computer time; (iii) nature of research programmes undertaken by different departments and the level of computer usage as well as existing computer capability of the faculty (iv) limitation imposed on research programmes due to non-availability of in-house computer facility and (v) management set-up available in the University to ensure maximum utilisation of a computer centre when established in the University. On the basis of these criteria, the Committee made an estimate of the immediate prescriptive needs as well as the projected computer needs for the next five to ten years.

The main observations of the Committee are listed below :-

(1) The Baroda University which is a residential one, has a complex of faculties such as Engineering and Technology, Sciences, Education and Home Science in Arts etc., and has a sizeable population of research students and faculty engaged in research programmes which require adequate computer facility. (2) T

(2) The computational needs of the teaching and research community of the Baroda University have been met partially over the past several years by hiring computer time at the computer centres in Baroda, Ahmedabad and Bombay. The University and the research workers have spent on an average about Rs. 1 lakh per annum to buy computer time equivalent to about 500 hours of an IBM-360-44 System.

(3) The different departments and faculties of the University have several research schemes, a large number of which require use of appropriate computer systems. The research projects are of a diverse nature and of different levels of computer use. In the case of Electrical Engineering students and also M.Sc. Statistics, training on concepts and use of digital computers is required as part of their courses of study. Computer Technology is one of the electives offered in III and V year B.E. classes. The M.E. students are requred to take 3 courses in computer techniques.

(4) Lack of an adequate level of computer facilities within the University has imposed apparent limitations on the nature of research programmes undertaken by the faculty. The courses have also tended to be mostly theoretical, with very little opportunities for using a computer.

Contd...3/-

(45)

(5) The University in its proposal has identified some well defined programmes for (a) imparting training in computer science to the graduate as well as undergraduate students particularly in the Faculty of Engineering Technology and the Faculty of Science and (b) to initiate appropriate research programmes as justifiable extensions to existing research activities and requiring use of a medium siz e computer system. From the routine applications point of view, the University has sufficient load of programmes relating to University admissions, examinations as well as accounting and adminstrative needs besides cateloguing Documentation and information retrieval programmes.

(6) The University has also been able to give due consideration to the level of the computer system to be obtained, including the perpherals and the personnel requirements for management of such a computer centre. The University feels that the computer system which can meet its needs of the Baroda University shoudl be a "general purpose" and "growth-oriented" system. It has also identified the hardware and the software requirements of such a system, which could be developed in two successive phases,

On the basis of the above considerations, examination of the available data furnished by the University and the discussions which the Committee had, during its visit, the Committee makes the following recommendations :-

(1) The Committee recognises a fully justified need for development of a computer centre in the Baroda University. The computer Centre should be equipped with a medium size computer system with necessary peripherals. An optimum system required for this Centre could be developed in two phases over a period of five years.

(2) The computer System with features suggested (appendix) is, therefore, recommended to be obtained and the University Grants Commission may make available the grant required for the purpose. This would cost about Rs. 30 lakhs in I phase and 5 lakhs in II Phase.

(3) The Computer Centre when developed, besides meeting the needs of the University Departments, would also have other non-university users particularly industrial users from the industries in the neighbourhood. This may help the Computer Centre becoming self-supporting within a short period.

(4) The personnel requirements for maintenance staff and operation of the Computer Centre would be worked out by the UGC Standing Committee on the basis of the computer system to be obtained by the University. The Commission may provide necessary assistance for such personnel requirements as well as for installation of the computer system.

Contd...4/-

(5) The cost of an appropriate building for the Computer Centre and air- conditioning and the installation of the computer should not exceed Rs. 3 lakhs.

(6) Requirements of the University for starting any short term training activities computer science or courses and to have necessary academic staff for its teaching programmes by utilising the computer centre should be found by the University in its normal Fifth Plan grants. The requirements for non-academic and non-technical supporting staff for the Computer Centre should be found by the University within its normal maintenance budget.

(7) A major part of the recurringexpenditure of running and maintenance of the computer centre should be met by the earnings of the computer centre by way of (a) charging for the computer time, (b) savings from the expenditure presently incurred by the University on buying computer time, (c) savings accrued from stoppage of honorarium to individuals employed presently for compilation of examination results and also from (d) consultancy services and selling computer time to outside users, both educational as well as industrial users. Accordingly, the recurring grant to be paid by the University Grants Commission for Technical staff of the Computer Centre could be worked out on a net deficit basis after determining the personnel requirements of the Computer Centre and estimated revenues of the Computer Centre from these different sources.

(8) While utilising the earning of the Computer Centre to meet partly the maintenance and recurring costs, it would be desirable to set-aside 10% to 15% of such earning towards building capital fund for adding necessary peripherals and growth of the computer system itself.

(9) The University, in consultation with the Electronics Commission, Government of India and availability of foreign exchange resources may decide upon the computer system to be purchased. The system may be developed in two successive phases as indicated above. The appointment of the staff for the Centre may be made progressively with the growth of the use of computer facility. The University has indicated its desire to go in for a TDC-316 system, meeting the configuration suggested above.

(10) The Committee would also recommend that until such time the University establishes its own computer centre by purchase of the computer system referred above, the University Grants Commission may give an annual grant not exceeding Rs. 50,000/- to the University for purchase of computer time from other computer centres particularly for its reasearch programmes. This amount will not be utilised for meeting its administrative needs of computer facility.

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Appendix

Suggested Computer System

Phase I

(i) Central Processing Unit with fifteen 16 bit general purpose registers with

(a) Memory allocation and Protection Unit

(b) Hardware Bootstrap loader

(ii) 28-K words, 16 bit word length of core memory.

(iii) Systems Typewriter, ASR- 35

(iv) Card reader (600 CPM) with Buffer and Controller

(v) Line Printer (600 LPM) - with Buffer

(vi) 2 Magnetic tape Transports, 9 track 37.5 pips and 556/800 bpi with V.C.B. and controller and 50 Tapes (min 1600 feet)

(vii) Systems clock*

(viii) Magnetic Disc Drive 7.25 m bytes with 10 Disc Packs *

(ix) Other Miscellaneous Hardware.

(x) Supporting software- as supplied.

(xi) 2 Key Punches.

(xii) 1 Sorter.

(xiii) 1 Verifier.

(* optional in I Phase)

Phase II

(i) Flating Point Processor.

(ii) 2 Key Punches.

(iii) Disc Drives and Disk packs (if not included in phase I)

(iv) Additional Magnetic Reels.

** One of the member has suggested that university should not invest on a sorter which is electrone chamical device. By the time computer system is installed the ECIL would have developed a SORT package to be used on the computer. (Other computer manufacturers provide SORT packages). Even if ECIL does not provide this the university can take it up as a research project and try to develop it. It would take about two years to develop this and it is worth waiting instead of investing on an electro mechanical sorter which would not be of much use even during this intervening period.

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POSITION OF COMPUTER FACILITIES IN THE UNIVERSITIES (AS ON 1.4.1976

State	Computer installed in the university of	Computers approved University of	Under Consideration	Grant given for buying Comp. time instead.	Remarks
Andhra	(1) Andhra (IBM -1130) (2) Osmania (TDC-12)			(1) Sri Venkaeswara University (50,000 p.a)	
Ass-am		(1) Gauhati (TDC -316) (2) Dibrugarh (TDC-312)			
Bihar		(3) Ranchi (TDC-316)			
Delhi	(3) Delhi (IBM-1620) (IBM-360) (4) J?N.U. (R-1020)				IIT Delhi.
Gujarat	(5) Gujarat (IBM-1620)% (6) Sardar Patel (IBM-1620) %%				% On transfer from PRL %% On transfer from Delhi.
Haryana	(7) Kurukshetra (TDC-316)		(1) Baroda		
J & K		(4) Jammu (TDC-316)			
Karnataka	(8) Karnatak (TDC-312) (9) Ind. Inst. of Sc (IBM-360)		(2) Mysore (3) Bangalore		
Kerala		(5) Kerala (TDC-316)			
Maharastra	(10) Bombay (IBM-1620)	(6) Bombay (TDC-316) (7) Poona ***			IIT Bombay

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1	2	3	4	5	6
Orissa	(11) Utkal (IBM-1130)				
Panjab	(12) Panjab (IBM-1620) **	(8) Panjab **			** Replacement approved for larger computer.
Rajasthan	(13) Jodhpur (TDC-312) (14) B.I.T.S. Pilan (IBM-1130)				
Tamilnadu	(15) Madras (IBM-1130)		(4) Annamalai		IIT Madras
U.P.	(16) Aligarh (IBM-1130) @	(9) Banares *** (10) Roorkee ***	(5) Lucknow		@ Proposal for larger system under consideration. *** Computer system to be finalized in consultation with the deptt. Electronics.
West Bengal	(17) Calcutta (IBM-1130)		(6) Jadavpur	(2) Viswa Bharati Rs.50,000 p.a.)	IIT Kharagpur
Madhya Pradesh	-	-	-	-	-
Himachal Pradesh	-	-	-	-	-

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CONFIDENTIAL

UNIVERSITY GRANTS COMMISSION

Meeting:

Dated : 29th April, 1976.

Item No. 14 To further consider the question of increase in the value of the fellowship awards under the scheme of 'Preparation of University level books by Indian Authors'.

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The Commission at its meeting held on 11th August 1975 (Agenda Item No.7.) considered the recommendations of the Review Committee on the scheme of 'Preparation of the University level books by Indian Authors' and approved certain changes in the rules governing this scheme. A copy of the revised brochure on the scheme is at Annexure

Under this scheme an author working on an approved bookwriting project in addition to his normal appointment may engage a fellow to assist him. In the case of the retired scientists and teachers, they may take up the book-writing projects themselves on whole-time basis by availing of the fellowship award available under the scheme. About six retired teachers have been working whole-time under this scheme. Previously the value of the fellowship available for a fresh person appointed as a fellow assisting the author or the retired teacher working whole-time under a book-writing project, was Rs.500/- p.m. (fixed at the time of the inception of the scheme in 1970-71) however, the Commission decided to increase the value of this fellowship to Rs.600/- p.m. with effect from the 1st September 1975. It has also been decided that in the case of the fellows who have worked for two years or more and shown satisfactory work, the value may be increased to Rs. 600/- with effect from the last September 1975. (An inservice teacher appointed as a fellow is eligible to the fellowship grant equal to the pay & regular allowances admissible to him in the teaching post but upto a maximum of Rs. 1100/- p.m. In case an inservice author supervisor himself decides to work whole-time and without a fellow on the approved book writing project, he is entitled to the fellowship grant equal to his emoluments in his regular appointment without any restriction).

Consequently, all the fresh fellows appointed under the scheme on or after 1st September 1975 are eligible for the enhanced fellowship grant at Rs. 600/- p.m. Amongst the fellows and the retired teachers already working under the scheme, only such of them are eligible for the enhanced fellowship grant at Rs. 600/- p.m. from 1st September 1975, as have completed two years under the scheme on that date. Others continue to get the fellowship-grant at the old rate of Rs.500/- p.m. till they complete two years. This has given rise to an anomalous situation in as such as that the fellows/retired teachers working under the scheme who have not completed two years on the 1st September 1975 are put to disadvantage as compared to the fresh fellows appointed/to be appointed on/after the 1st September 1975 and who though comparatively inexperienced and considerably junior to those already working under the scheme,

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get higher grant by virtue of this decision.

/He took up work under an approved book Writing roject entitled

In this category the Commission has received a request from Prof. S.M.Dass./"Fundamentals of Ichthyology" on the 1st September 1972 at the Kashmir University. At that time he was working as Head of the Zoology Dept, in the Kashmir University and he took up the book writing project in addition to his normal appointment. He appointed a fellow (Km. Sharifa Akhtar) to assist him. But subsequently Dr. Dass retired from the Kashmir University and the fellow (Km. S. Akhtar) also resigned from this project. Later Dr. Dass resumed work under this project at the Lucknow Univers ity on whole-time basis by availing the fellowship (vacated by Km. Sharifa Akhtar) himself with effect from the 18th November 1974. Three years effective tenure (i.e. excluding the period of break from 11-10-73 to 17.11.74) of this project can go upto 7-10-76. Since Dr. Das has not completed two years in the fellowship-award (i.e. whole-time work) under this project as on 1.9.75 he continues to be paid the fellowship-grant at Rs. 500/- p.m.

Dr. Das has represented repeatedly for raise in his fellowship grant. Since the UGC has increased the honorarium paid by it to the retired teachers under another scheme 'Utilisation of the services of retired teachers' from Rs. 500/- p.m. to Rs. 750/- p.m. Dr. Das has also been urging for increase of his fellowship grant to Rs. 750/- p.m. The two schemes are quite independent of each other.

In these circumstances the following two points are submitted for consideration of the Commission:

(a) Whether with a view to avoid the above anomalous position, the value of the fellowship under this scheme may be increased to Rs. 600/- p.m. viz w.e.f. 1st September 1975 for all the fellows working under this scheme (irrespective of the period put in); from the date of appointment as in the case of fresh fellows appointed on/after 1st September 1975.

(b) Whether in consonance with the increase in the honorarium under the retired teachers scheme sanctioned by the Commiss ion, all the retired teachers/scientists already working whole-time under this scheme or such retired teacher who may take up whole-time work under it in future may be allowed the fellowship-grant at Rs. 750/- p.m. w.e.f. the 1st September 1975 or from the date of their taking up the book-writing project, whichever be later. It may be mentioned here that the book writing projects to be undertaken by retired teachers, are evaluated by one expe-rt for preliminary selection, whereas the proposals under retired teachers scheme are evaluated by two experts & then screened by a committee. Besides, the retired teachers are to be

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sponsored by the University on basis of their outstanding merit, for research and teaching activities (Contact work programmes for 3 to 6 hours a week) after their retirement. These activities may include teaching, seminars, guidance of research, besides his study and research.

The matter is placed for consideration of the Commission.

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PREPARATION OF UNIVERSITY LEVEL BOOKS

BY INDIAN AUTHORS

UNIVERSITY GRANTS COMMISSION
NEW DELHI
1975

PREPARATION OF UNIVERSITY LEVEL BOOKS BY INDIAN AUTHORS

1. INTRODUCTION

1. With a view to supplementing the efforts of the State Government for the production of books in Indian Languages, the University Grants Commission, in collaboration with the Government of India, Ministry of Education and Social Welfare, initiated in 1970-71 a programme of providing financial assistance for writing of quality books for universities and colleges. The key factor in the entire process is to involve outstanding teachers, researchers and scholars in the universities, colleges and other institutions of higher learning and research to take a lead in the preparation of high quality books for use at the university stage.

2. OBJECTIVES

2.1 The objectives of the scheme is to provide financial assistance to outstanding senior academics and research scholars in universities and colleges and other institutions of higher learning and research for the preparation of high quality books, monographs and reference material for use in universities and colleges, not necessarily conforming to a particular set of syllabi but indicating the level of training desired to be attained at different stages of university.

2.2 The theme, subject matter and contents of the books, monographs, etc. prepared under the scheme should reflect present situation as obtaining in India and should be relevant to the social goals and the educational future as visualised by the society. As far as feasible, thematical approach may be encouraged.

3. THE UGC PROGRAMME

3.1 The UGC would make available opportunities and financial support to university teachers and other scholars for the preparation of books, etc. in any one of the following ways :

3.2 Outstanding teachers desirous of devoting full time over a period of one or two years for writing books may take leave from their positions without any loss of their seniority, increments, etc. Such teachers may be paid by the UGC a sum equivalent to the salary and allowances drawn by them with provision for increments due during the period of their undertaking the project under the scheme. Such teachers would also receive a contingent grant of Rs.2000/- p.a. for secretarial and other assistance, purchases of stationery and typing of the materials and also for collection of materials from other libraries etc. In exceptional cases, and additional sum of Rs.1,000/- p.a. may be given for such contingent expenses. The teachers may, if they so desire, continue to participate for not more than four hours per week in the teaching/research activities of the department in addition.

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3.3 In the case of teachers who wish to undertake the book writing programme in addition to their normal teaching and research responsibilities in the universities and colleges, assistance may be available in the form of either :

a) a fellowship of the value of Rs.600/- per mensem to be awarded to a junior author, called fellow, and contingent grant of Rs.2,000/- p.a. (plus additional contingent grant of Rs.1,000/- p.a. in exceptional cases) for the purposes described above; or

b) where a teacher does not require a help of a fellow, only the use of contingent grant as above would be permitted.

3.4 In the case of outstanding scholars and scientists who are not in the service of a university or an affiliated college but are serving in an other organisation of higher learning and research, the provisions of the scheme described under Section 3.3 above would be available, if their proposals are sponsored by their employing organisation.

3.5 Outstanding scholars and scientists who have retired from service from a university or a college, may also participate in this programme, provided they are below the age of 65 years and have not had the benefit of any superannuation schemes such as the UGC scheme of 'Utilisation of Services of Retired Teachers' or the CSIR/ICAR/IMC scheme for retired scientists for a period of five years. Proposals from such persons should be sponsored by a university indicating their willingness to make available the normal laboratory and library facilities, for use for the duration of the book writing project. Such persons would themselves be eligible to receive a fellowship of Rs.600/- per mensem besides the contingent grant of Rs.2,000/- per annum (plus additional contingent grant of Rs.1,000/- per annum in exceptional cases) for purposes mentioned. Assistance of a fellow would not be available under this provision.

3.6 It would be possible for a group of two or upto five university teachers to jointly take up a book-writing material which could be put together in the form of a book. In such cases no provision for fellowship would be available but each such author would have access to a contingent grant of Rs.1,000/- p.a. for purposes indicated above. One of the teachers, in the group may be named as editor/coordinator for such a project and would undertake the responsibility of getting the manuscript ready for publication. The normal duration of such project would be one year only.

3.7 The Commission may also invite outstanding teachers to write university level books. Such invited authors may be given a lump sum honorarium of Rs.10,000/- for undertaking the writing of a book as approved by the Commission within a period of three years. This amount would include provision for any expenditure which the author has to incur in the preparation of the manuscript. A grant up to

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Rs.5,000/- may be made available in suitable instalments during the period for the preparation of the manuscript and the remaining grant of Rs.5,000/- will be paid after the manuscript of the complete book as approved has been accepted by the Commission. Under this provision, the author would not receive any additional support for appointment of a fellow or contingent expenditure.

4. Duration of the Project

4.1 The normal tenure of a project for the preparation of the manuscript of a book, monograph, etc. is two years only which may be extended in special cases by another year, bringing the total duration to three years.

4.2 The project can be terminated, however, at an earlier date on the completion of the manuscript. If the author desires to take up a second project during the remaining period, the proposal could be considered on merits.

4.3 No extension beyond three years should be possible, except in exceptional cases depending on the progress of the book-writing work where extension up to a maximum period of one year could be allowed by the Commission. In such a case the senior author/supervisor should complete the project within this extended period and the contingency grant up to Rs.2,000/- may be allowed. For shorter duration of extension the contingent grant may be reduced proportionately. No assistance for fellowship will be available during this extension period (i.e. beyond three years).

5. Award of Fellowship and Selection of Fellows

5.1 Fellowship, which will be full-time assignment, may be awarded to persons of outstanding merit and holding a Ph.D. degree, as far as possible, in case a suitable candidate with a Ph.D. degree in the concerned subject is not found available, the fellowship may be awarded to a candidate who has a consistently outstanding academic career and has secured a Ist class or a high second class Master's degree in the subject, with a minimum of 55% of the aggregate marks or at least B+ in the grade system and has shown distinct aptitude for research. Fellowship can be terminated owing to unsatisfactory work and on the recommendation of the senior author to whom the project is entrusted.

5.2 Fellowship may also be awarded to a young brilliant inservice teacher generally of the level of lecturer in a university or a college, and in such cases the fellow will be paid an amount equal to the regular emoluments (including allowances etc.) which he/she would have drawn in his/her post in the parent institution subject to a maximum Rs.1100/- per mensem. The duration of such in-service teacher-fellowship shall not exceed two years. The university/ college from which the teacher is selected will have to agree to give him/her study leave on loss of pay and protect his seniority, increments, etc., for the period the teacher is working on the book-writing project and allow him to rejoint duty at the completion of

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the project. In some cases, the fellow may be given teaching-work not exceeding two hours a week to enable him to continue his contact with teaching work.

5.3 It would also be possible under this scheme to award short-term fellowship initially for a period of six months, but in no case beyond twelve months. The value of such fellowship would be Rs.600/- per mensem in the case of persons with a Ph.D. degree and Rs.400/- per mensem for a person holding a first class or high second class master's degree. Such fellows would not treated as joint authors (section 9.1 below) nor, as in case of inservice teachers, get the benefit of protection of their salary as is permissible in case of regular long term fellowships (section 5.2 above). Fellows appointed under short term fellowship provision would not be entitled to the benefit of continuation of his fellowship towards working for Ph.D. degree after the completion of the book-writing project (section 6.1 below).

5.4 The appointment of the regular as well as the short term fellow will require the approval of the Commission.

6. Opportunities for fellows to continue their research work

6.1 Young teachers and scholars who may be awarded fellowship described under clause (a) of section 3.3 above may be encouraged to pursue their work for Ph.D. degree, wherever necessary, by an extension of the fellowship at the conclusion of the book-writing project. The total period of the fellowship, inclusive of the period spent on the book-writing project shall not exceed five years. However, the continuation of the fellowship for the Ph.D. work after the book-writing project has been completed should not be automatic but would be considered on merits of each case, depending upon the quality and standard of the book produced, the fellow's contribution towards preparation of the book and evaluation of the completed manuscript by the editorial committee appointed by the University Grants Commission for the purposes.

6.2 A fellow appointed under the book writing scheme shall not be eligible to register or work for a Ph.D. degree or take up any other work concurrently since the assignment under book writing fellowship is full time job. The fellow, if he so desires, could however, use the material collected during the course of the book writing project for his doctoral dissertation.

7. TYPES OF BOOKS TO BE PREPARED

7.1 Unless there is an outstanding proposal for the writing of a book at undergraduate level, the Commission lay more emphasis on accepting a proposal for the preparation of a book, reference material etc. for honours and postgraduate level. Preference may however, also be given to proposals for the preparation of book etc. in the

...5/

areas in various disciplines where gaps existed and needed to be filled. Books, etc. prepared in English or Hindi under the scheme, could be passed on to the State Granth Academies for translation in different regional languages. Under the UGC scheme no proposal for translation of available books would be accepted.

7.2 The Commission may accept a proposal for the preparation of problem series and readings in various subjects. The senior author/supervisor, in such a case, should make a substantial/outstanding contribution by adding a significant introduction, comprehensive review/commentary, critical/editorial comments, bibliographies, indices, explanatory notes etc. in respect of the subject matter included therein. Preparation of abstracting series would be outside the purview of this scheme.

7.3 Since the Ministries of Health and Family Planning and Law have also schemes for the preparation of university level books in the subjects concerned, the UGC may not accept proposals pertaining to preparation of a book in medicine and law.

8. PROGRESS REPORT ON THE PROJECT

8.1 The senior author/supervisor shall submit to the UGC half-yearly report on the progress of the project along with a certified statement of expenditure actually incurred on payment of fellowship and contingencies during the preceding six months and estimates of expenditure for the next six months in the prescribed proforma. The release of subsequent instalments will be subject to prompt receipt of satisfactory progress of the project.

8.2 The senior author/supervisor shall report to the UGC every change that is made in the approved synopsis/outline/contents of the book-writing proposal. No major change shall be made therein unless the prior approval of the Commission has been obtained.

9. AUTHORSHIP AND ROYALTY

9.1 The senior author/supervisor, alongwith junior author appointed as a fellow under the project, will share equally the authorship and the royalties that may accrue from the publication of the book prepared under this programme, in accordance with the usual practice.

9.2 The inservice teacher and retired teacher/scientist undertaking a book writing project as senior author under section 3.2 above shall not receive any honorarium in addition to the grant received by him/her under this project.

9.3 The fellow appointed under the scheme shall not accept or hold any other appointment, paid or otherwise, or receive any emoluments, salary, stipend etc. from any other source during the tenure of the award.

....6/-

9.4 The contingency grant available under each project would be used by the senior and/or junior authors as the case may be.

9.5 All books, periodicals, photographs, microfilms, erox copies and other reprographic materials purchase for the project shall be transferred on its completion to the library of the institution which has sponsored the project, under intimation to the U.G.C.

10. EVALUATION AND ACCEPTANCE OF THE MANUSCRIPTS

10.1 A committee consisting of three experts in the subject area may be constituted for each title of the books undertaken under this scheme. It would be open to the teacher undertaking this project to request the University Grants Commission to constitute such a committee at an appropriate time during the preparation of the manuscript and consult to the members of the committee. This committee would be concerned mainly in ensuring proper standard and quality of the manuscript and may make suitable suggestions to the author in this regard. The treatment of the subject and the manner of presentation would, however, be the responsibility of the teacher to whom the project is entrusted. The same committee would evaluate the final manuscript and make suitable recommendations for its publication.

10.2 The senior author shall make five copies of the manuscript of the books, monograph etc. approved under the scheme. One copy of the manuscript will be sent to each of the three members of the editorial committee appointed by the UGC for evaluation, and one copy will be sent to the UGC for record.

11. PUBLICATION OF BOOKS

The authors may arrange for the publication of the manuscripts through the publishing houses. Care should, however, be taken that the pricing of the books would be kept as low as possible, particularly since the publishers would have made no investment towards preparation of the manuscript. The UGC assistance should be acknowledged appropriately in the publication.

11.2 It may also be possible to make available in suitable subsidy, both to the general publishing houses as well as others under the existing scheme of subsidised publication of books by Indian authors initiated by the National Book Trust, wherever necessary, but in the light of the evaluation of the complete manuscript by the editorial committee.

12. HOW TO APPLY

12. Proposals from university AND college teachers and other scholars and scientists would be received in the prescribed proforma (enclosed) through the universities and colleges concerned or other sponsoring agencies as detailed above.

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13. SELECTION OF PROPOSALS

The selection of the proposals under the scheme would be made with the help of committees and subject panels appointed for the purposes. The teachers whose projects have been accepted under this programme would be informed of the same through the universities/institutions concerned and work on the project should be initiated within six months from the date of approval failing which the scheme shall be deemed to have lapsed and a fresh proposal would be necessary for reconsideration by the committee. Payment of financial assistance would be made through the sponsoring institutions.

University Grants Commission
New Delhi

Preparation of University level books by Indian Authors

PROPOSAL FORM

Three copies of the proposal should be sent to the U.G.C. through the Head of the Department and the University/Institution duly completed along with certificate of sponsorship.

1. Name :

2. Bio-data :

3. Books or monographs published, if any, indicating the title of the book, name of the publisher, year of publication, price whether it is prescribed as a textbook and the approximate number of copies sold so far.

4. Subjects and title of the book to be taken up for original writing and a brief outline indicating important aspects and usefulness of the proposed publication and the period by which the manuscript would be ready for publication.

5. Name and particulars of the person to be associated as a fellow (if already identified, and where applicable).

Certificate of Sponsorship

The University/Institution_____ agrees to sponsor the proposal received from_____ for undertaking the project of writing of books at the University Level, entitled_____ _____ and would make available the usual library and other facilities required by the author(s) and the Fellow to be appointed, if any, under this project. The Institution would also ensure a successful completion of the project within the prescribed time and to make available to UGC the final manuscript and would undertake the responsibility of receiving and disbursing the amounts made available under this project and to furnish to the UGC six monthly progress report on the project, an annual statement of accounts duly audited and also utilisation certificate at the completion of the project.

Sd/-
Senior author to whom the Project is entrusted (Name and Designation).

Sd/-
Registrar/Head of the Institution
(Seal of the Institution)
Date

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UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976.

Item No. 15 : To consider further the question of institution of Readership in single faculty colleges.

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The University Grants Commission at its meeting held on 15th December, 1975 considered a reference from Government Bikram College of Commerce, Patiala regarding institution of Readership in single faculty colleges (Item No. 13). A copy of the note placed before the Commission is attached (Annexure). The Commission desired that a specific proposal with regard to the norms for such colleges may be brought before the Commission.

In this connection a few general criteria are indicated below for consideration :-

(1) The college should have satisfied all conditions of affiliation and should have secured permanent affiliation with the university.

(2) The college should have demonstrated its willingness to initiate change and innovation in teaching and internal assessment.

(3) The college should have an enrolment of atleast 100, a student-teacher ratio of 1:10, good staff to be judged by the proportion of teachers with first class post-graduate or research degrees and with research publications, facilities for post-graduate education and research and a library of at least 20,000 books and 10 to 20 research and professional journals. These criteria would apply to teachers training, Home Science and Physical Education C Colleges.

(4) The college should have an enrolment of atleast 500, a student-teacher ratio of 1:20, good staff to be judged by the proportion of teachers with first class Postgraduate or research degrees and with research publication, provision for tutorial system on an institutional basis, good examination results (60% and above), a library of atleast twenty to thirty thousand books and 15 to 20 academic and professional journals and facilities for Postgraduate and research at Ph.D. level.

The matter is placed before the Commission for consideration.

A.S.(CP)

Annexure to Item No. 15

Copy of the note placed before the Commission in its meeting held on 15th December 1975, (vide item No. 13).

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Under the Commission's scheme of institution of Readerships in colleges for which proposals have been invited from colleges through the universities, the criteria laid down by the Commission include the following:-

(a) The college should not have less than 800 students on its rolls if providing a three-year degree course or 500 students for a two year course at undergraduate level, excluding postgraduate students, if any, and with a minimum faculty of 40 permanent teachers excluding demonstrators, tutors etc.,

(b) The colleges and the departments seeking assistance to create posts of Readers should have adequate facilities in the shape of library, laboratory equipment and faculty. The commitment of the college for the development of the department would particularly be seen from its overall recruitment policy, e.g. whether it is generally appointing only people with a consistently good academic record and Ph.Ds. as far as possible.

(c) A department of a college seeking assistance to create positions of Readers should have already on its staff atleast six permanent and qualified teachers and a viable enrolment in this subject. It should also have a viable research programme or an innovative educational programme.

(d) Generally one such post can be requested for a department and UGC assistance for such posts will be on 100% basis. In special cases, the Commission may consider providing additional Readerships in a Department on the merits of each case.

In a communication addressed to the Commission, the Principal of the Government Bikram College of Commerce, Patiala has indicated that because of the above conditions, his college does not qualify for obtaining post of Reader under UGC scheme. He has further requested the Commission to relax these conditions in the case of single faculty colleges for the following reasons :-

(1) This College admits students only to B.Com. and M.Com. and the number of students admitted for B.Com and M.Com. has been deliberately kept low. The enrolment figure is only 425 at present.

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(2) The College is only a single faculty one and therefore, has only 20 lecturers. The results of the college have been always very good and the college feels that by getting a Reader, the teaching faculty would be strengthened and will be able to enrol students for M. Litt. and even Ph.D.

The College has sought reconsideration of the Commission to relax the conditions regarding enrolment and teachers on the above basis so that it could also move the Commission for institution of Readerships in the college. A similar situation may also arise in the case of Teacher Training Colleges.

The matter is placed before the Commission for its consideration.

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CONFIDENTIAL

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UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976.

Item No. 16 : To consider a proposal from Government of Madhya Pradeshh to create Readership in the universities for assignment to the Government Colleges.

The University Grants Commission at its meeting held on 2-3rd June, 1975 accepted the guidelines suggested by the Working Group for institution of Readership in Colleges. A copy of the guidelines is enclosed (Annexure-I) the decision of the Commission was conveyed to the universities in August, 1975 with the request to send proposals for the consideration of the Commission.

The Government of Madhya Pradesh has now intimated that in view of the conditions laid down by the Commission for institution of Readership in Colleges regarding pay scales and mode of selection, it would not be possible for the State Government to fit in the posts of Readers in the regular cadre of the State Education Service as there are large number of Government Colleges doing Postgraduate work.

The State Government has further informed that the matter was discussed with the Vice-Chancellors of State Universities in Madhya Pradesh and it has been agreed that posts of Readers as may be sanctioned by the Commission for Government Colleges may be created in the respective universities service and the persons so selected may be seconded by the Universities to the Colleges for whom these posts are sanctioned (whom by/the Commission. The State Government would underwrite the continuance of these posts in university service beyond five years period. An extract from the letter received from the State Government in this respect is enclosed (Annexure-II)

The matter is placed before the Commission for its consideration.

AS(CP)/Addl. Secy.

SLK

Annexure I to Item No. 16

Criteria laid down by UGC for Institution of Readerships in colleges.

(a) The College should be permanently affiliated to the University concerned.

(b) It should not have less than 800 students on its rolls if providing a three year degree course or 500 students for a two year degree course at undergraduate level, excluding postgraduate students, if any, and with a minimum faculty of 40 permanent teachers excluding demonstrators, tutors, etc.

(c) The colleges and the Departments seeking assistance to create posts of Readers should have adequate facilities in the shape of library, laboratory equipment and faculty. The commitment of the college for the development of the department would particularly be seen from its overall recruitment policy, e.g. whether it is generally appointing only people with a consistently good academic record and Ph.Ds. as far as possible.

(d) A Department of a college seeking assistance to create positions of Readers should have already on its staff at least six permanent and qualified teachers and a viable enrolment in this subject. It should also have a viable research programme or an innovative educational programme.

(e) Generally one such post can be requested for a department and UGC assistance for such posts will be on 100% basis. In special cases, the Commission may consider providing additional Readerships in a Department on the merits of each case.

(f) The selection of Readers so approved, would be on an open selection basis and the mode of recruitment should be on the same basis as for posts of Readers in the university concerned. The selection would be made centrally for all colleges affiliated to that particular university by the University authorities by properly constituted selection committees. The Selection Committee will be as constituted for the appointment to be made by the university. It may, however, provide for, wherever necessary (a) a nominee of the Vice-Chancellor to preside and (b) the Principal of the college concerned to be associated with it.

(g) If any of such Reader's posts created under this scheme falls vacant subsequently, the vacancy is also to be filled through the same procedure of selection and by the Selection Committee as indicated above.

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(h) The assistance from the UGC for such posts of Readers would be available on a 100% basis for a period of five years from the date of appointment of the Reader, subject to the condition that the expenditure on effectively maintaining such Readers' posts would be taken over by the college/State Government at the end of the period of UGC assistance. It is generally expected that appointments to such posts of Readers would be made within a period of six months from the date sanction is given by the UGC for the creation of such a post. Individual universities may specify a date by which it could receive proposals from the Colleges seeking assistance for creation of posts of Readers under this scheme and forward them also to the Commission by a specified date each year.

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Annexure-II to Item No.16

Copy of Government of Madhya Pradesh, Education Department letter No.D.O.No.1320/XX/V/VII dated 12th February, 1976 addressed to Secretary University Grants Commission, New Delhi.

Kindly refer to my d.o. letter No. 73/203/G-7/75 dated the 5th January, 1975. We had requested for extension of the last date for submission of proposals in case of Government Colleges under the UGC scheme for institution of Readerships in Colleges. Your reply is yet awaited. However, from the Universities it is learnt that you have extended generally the last date for submission of proposals to 15th February, 1976.

2. You are aware that Madhya Pradesh has a large number of Government Colleges doing post-graduate work. The implementation of the scheme in these colleges will strengthen the existing teaching staff in these colleges and greatly tone up the instructions imparted therein. However, in view of the conditions laid down by the Commission in respect of payscale and mode of selection, it would not be possible for the State Government to fit in the posts of Readers in the regular cadre of the State Education Service. As such, the matter has been discussed with the Vice Chancellors of the State Universities in M.P. and it has been agreed that posts of Readers as may be sanctioned by the Commission for Government Colleges may be created in the respective University Service and the persons selected may be seconded by the the Universities to the Colleges for whom the posts are sanctioned by the Commission. The State Government would underwrite the continuance of these posts in University Service beyond the five year period. On hearing from you the proposals from individual colleges could be submitted on these lines within a period of three months.

3. May I request you to communicate the concurrence of the Commission in the modified scheme as elaborated above and also allow the State Government to forward proposals of the Colleges through the University concerned within a period of three months?.

With regards ,

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CONFIDENTIAL

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UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976

Item No. 17 :To considor the question of granting leave on academic grounds to Junior and Senior research fellows during tenure of fellowship.

....

There is a provision in the rules for award of Junior and Senior Research Fellowships in Sciences and Humanities including Social Sciences that the fellow may, in special cases, be allowed by the Commission leave without fellowship on academic ground for a period not exceeding three months during the tenure of award on the recommendations of the supervisor and the institution concerned. The period of leave without fellowship will count towards the fellowship tenure.

The Junior and Senior research fellows sometime get temporary appointments as teachers in the same departments or in different Institutions. The tenure of this temporary appointments as teachers in the same deptt. or in a different Institution, some time ranges from a few days to two months or more beyond three months and in such cases the fellows frequently go on leave and resume their research work seek permission to resume work after the expiry of leave.

The matter regarding grant of leave without fellowship in such cases was placed before the UGC panels (annexure-I) in Humanities and Social Sciences. The consensus of the panels was that the present procedure of granting extra ordinary leave not exceeding three months during the entire tenure of a Research fellow may continue. The views of the panels have been indicated in the annexure-II

The matter is placed before the Commission for consideration.

AS(RF)/JS(II)

Annexure-I to item No.17

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UNIVERSITY GRANTS COMMISSION

Item No. Ton consider the question of granting leave on acade,oc grpinds to the junior and senior research fellows during a tenure of fellowship.

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There is a provision in the rules for award of Junior and Senior research fellowships in Sciences and Humanities including social sciences that the fellow may, in special cases, be allowed by the Commission leave without fellowship on academic ground for a period not exceeding three months during the tenure of award on the recommendations of the supervisor and the institution concerned. The period of leave without fellowship will count towards the fellowship tennure.

In special cases, the Commission had been accepting the requests of the fellows for grant of leave without fellowship for more than three months. The Commission has now decided that the limit of three months should be adhered to and leave without fellowship may not be granted beyohd three months. A fellow desiring to go on leave for more than three months, may give up his fellowship and if he desires to resume his work at a later stage, he may apply for a fresh award.

The junior and senior research fellows sometime get temporary appointments as teachers in the same department or in a different Institution The tenure of this temporary appointments as teachers in the same Deptt. or in a different Institution some times ranges from a few days to two months or three months and in such cases the fellows frequently go on leave and resume their research work. It is now for consideration whether the fellows be granted leave without fellowships on academic grounds only once during the fellowship tenure even when the period of such leave is less than three months or they should be allowed to go on leave as many times as they like provided the total period of such leave does not exceed the period of three months during the entire fellowship tenure.

The matter is placed before the Panel for consideration.

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Appendix-II to item No.17

Item : To consider the question of granting leave on academic grounds to the Junior and Senior Research fellows during the tenure of fellowship.

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The note received from R.F.Section about granting leave without fellowship to research fellows was placed for consideration before the Panels in the Humanities and Social Sciences. The views of the Panels on this question are indicated below :-

1. Panel on Linguistics.

The Panel felt that the period of leave without fellowship on academic ground should not exceed three months and the present procedure in this regard may continue.

2. Panel on History.

Leave without fellowship on academic ground i.e. for working in an academic post in a University, College or a recognised research institute may be given to a fellow for a maximum periof of six months during the tenure of award. This period of leave may count towards the fellowship tenure and no extension be given to a fellow on the ground that he has been on leave without fellowship.

3. Panel on Psychology.

The research fellows should normally be given leave up to three months on academic grounds and only in exceptional cases, leave may be extended up to six months.

4. Panel on Political Science.

The fellow may be allowed, in all, six months leave, either in part or in bulk which should count towards total period of their fellowship.

5. Panel on Sociology.

Fellows may be allowed to avail of three months leave during the tenure of fellowship either in part or in one stretch of time. The period of their leave should be counted towards the tenure of fellowship. The panel did not favour the idea of extending the period of leave beyond three months, in the event of the appointment of fellow as a temporary lecturer.

6. Panel on Philosophy.

The Panel was of the view that there was no need to change the present rules about leave without fellowship and the present practice may continue.

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7. Panel on Economics.

Research fellows may be given six months' leave on academic grounds but the leave should be at one stretch. During the period of leave no fellowship should be drawn and the period of leave should be included, in counting the duration of fellowship.

8. Panel on Law.

Leave up to a maximum of three months be sanctioned to a fellow on academic grounds during the tenure of award, and this period should account towards the fellowship. Leave could be taken in parts.

9. Panel on Social Work.

A fellow may be allowed to take three months leave without fellowship, in parts, if he so desires. The Panel was not in favour of extending the period of leave without fellowship beyond three months.

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UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976

Item No. 18 To consider a proposal regarding enhancement of the annual allocation made under the Scheme of 'Unassigned Grants to Universities'.

The UGC at its meeting held on 18th April, 1974 considered the recommendations of the Committee appointed by it to review a list of items under the unassigned grants during the Fifth Plan period. The main recommendations made by the Committee for the implementation of the scheme are indicated below :-

a) The Universities may be permitted to meet 50 percent of the cost on maintenance and registration expenses abroad for teachers attending/participating in the International travel. (It was felt that many good teachers could not participate in such conferences abroad due to the fact that they could not get maintenance and registration expenses from any source). This will be subject to the condition that the remaining 50 per cent of the maintenance and registration cost would be met by the University or the State Government.

b) The Universities which could not utilise the total unassigned grant and were able to save amount in a particular year may be considered favourably for allocation of higher unass-igned grant for the subsequent year and much higher allocation could be sanctioned by adjustment against the spillover with them. It was agreed that only 50 per cent of the spillover in a particular year could be considered for utilisation during the subsequent year over and above the normal allocation of unassigned grant to a University.

c) The Universities/Institutions may be asked to spend upto 60 per cent of their unassigned grant on items. 1 and 2 in the Annexure I. The Universities may also be persuaded to give equal emphasis on Item 1 and 2 so that teachers get more opportunities for visiting Centres/ places within the country. The Universities may be permitted in special cases to spend with prior approval of Commission upto 10 per cent over and above 60 per cent of the unassigned grant for items 1 and 2 covering assistance to teachers for attending International Conferences and National Centres/ Research organisations.

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d) The criteria of allocation of unassigned grant during the Fifth Five Year Plan agreed to by the Committee may be as under:-

(i) The amount may be determined on the basis of Rs.25/- per faculty member, Rs. 10/- per University research scholar and Rs. 5/- per post-graduate student of the university subject to a minimum of Rs. 15,000/- and maximum of Rs. 80,000/-. The figures of the faculty members, research and postgraduate students are to be taken as on 15th of August of the previous years

(ii) For UGC Unit Rs. 10,000/- to a University having less than 50 affiliated colleges and Rs. 15,000/- to a University having 50 or more affiliated colleges.

e) The Universities may be allocated additional funds for purposes of assisting college teachers to travel inside the country. The amount to be fixed for this purpose may be determined later on receipt of information regarding the total number of colleges teachers/Post-graduate students/Under-graduate students in colleges affiliated to different universities.

f) During the Fifth Plan discussions, the State Governments may be asked to formulate to consider placing of such certain lump-sum amount as unassigned grant to the universities for matching share for the schemes to be covered under unassigned grant.

The Commission accepted the recommendations of the Committee with regard to the scheme of 'unassigned grant' to universities for the Fifth Plan period. A copy of the recommendations of the Committee on 'unassigned grants' as accepted by the Commission is enclosed. (Annexure II). The Grants were allocated to the universities during the year 1974-75 and 1975-76 in accordance with the criteria indicated above.

The Universities have represented that the grants paid under the Scheme are inadequate and they are unable to accommodate number of requests received from teachersor Scholars from Deptt. of Colleges for award of Travel grants for visiting centre of Research, to attend Conferences and Seminars. It has also been represented that consequent upon the revesion of scales of pay and increase in Dearness Allowance etc. the amount provided for UGC unit is also inadequate.

The matter is placed before the Commission for consideration whether the basis of ass-istance as detailed below for allocating unassigned grants to universities may be revised during 1976-77.

i) The amount may be determined on the basis of Rs.25/- per faculty member, Rs. 10/- per University research scholar

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and Rs.5/- per post-graduate student of the university subject to a minimum of Rs. 15,000/- and maximum of Rs.80,000/-. The figures of the faculty members, research and postgraduate students are to be taken as on 15th of August of the previous year.

(i) For UGC Unit Rs. 10,000/- to a University having less than 50 affiliated colleges and Rs. 15,0000/- to a university having 50 or more affiliated colleges.

A.S. (CP)

Annexure I to Item No. 18 .

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BASIS OF UGC ASSISTANCE UNDER UNASSIGNED GRANT FOR 1973-74.

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ITEM OF EXPENDITURE	UGC CONTRIBUTION
Travel grant to teachers in Universities for attending International Conferences abroad.	50% of the travel expenses only (First class rail fair in India and International air fare by economy class) provided the other 50% is met by the University from its own sources. No grant is admissible for maintenance abroad or for incidental expenses. Teachers participating in such Conferences, seminars, etc., should travel by Air India on the sectors where it operates. Even on sectors where it does not operate, the air passage should be booked through Air India.
2. a. Travel grant to teachers/ Scholars/Technicians for visiting centres of research or to attend academic conferences/ seminars within India.	T.A. & D.A. according to University rules.
b. Travel grant to research scholars in connection with their work at other research centres.	Same as above.
3. Exchange of teachers.	Visits of teachers/experts/scientists from within the country. The following guidelines may be followed :-

a. Free accommodation and boarding to be provided by the host university from its own funds.

b. Travelling expenses of the Visiting teachers/experts may be met out of the unassigned grant according to the rates prescribed by the host Institutions including air fare where necessary with the approval of the Vice-Chancellor.

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		c. The visiting teacher/expert may be paid an honorarium upto Rs.50/- per lecture/seminar subject to a maximum of Rs. 500/- for an assignment of not less than two weeks duration (to be met out of the unassigned grant
4.	U.G.C. Unit	Cent per cent subject to ceiling of Rs.10,000/- (for University having less than 50 affiliated colleges) and Rs. 15,000/- for University having 50 or more affiliated colleges. The expenses for engaging the service of Engineers/Chartered Accountants in connection with their visits to college affiliated to the University for certification of grants paid by the Commission may be met out of the UGC funds.
5.	Extension work by University teachers.	Cent per cent.
6.	Computer assistance buying the time of the Computer.	Cent per cent assistance for buying the computer time for research work only for teachers and scholars who do not receive contingent grant from any source
7.	Preparation and development of teaching material and aids.	Cent per cent.

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Annexure II to Item No. 18.

Recommendations of the Committee on Unassigned Grant as accepted by the Commission.

a) The Unive-rsities may meet 50% of the cost of International travel as also 50% of the maintenance and Registration expenses of teachers attending/participating in the International Conferences/Seminars etc. abroad. This will be subject to the condition that the remaining 50% of the International travel cost and expenditure on maintenance and Registration are met by the University/State Government from its own funds. The maintenance expenses would be payable as per rules laid down by the Government of India.

b) The Universities which are unable to utilise the total unassigned grant and are able to save amount in a particular year may be considered favourably for allocation of higher unassigned grant for the subsequent year and such higher allocation may be sanctioned by adjustment against the spillover with them. Fifty per cent of the spillover in a particular yearcould be considered for utilisation during the subsequent year over and above the normal allocation of unassigned grant to a University.

c) The Universities/Institutions may spend up to 60 per cent of their unassigned grant on items 1 & 2 :-

(1) Travel grant to teachers in Universities for attending International Conferences abroad.

(2) Travel grant to teachers/Research Scholars/Technicians for visiting centres of research or to attend academic conferences/ seminars within India.

The Universities may give equal emphasis on both items so that teachers get more opportunities for visiting Centres/places within the country. The Universities may, in special cases, spend with prior approval of Commission upto 10 per cent over and above 60 per cent of the unassigned grant for items 1 & 2 dealing with assistance to teachers for attending International Conferences and Centres of Research or to attend academic Conferences/Seminars within India.

d) The criteria of allocation of unassigned grant during the Fifth Five year Plan may be as under :-

(i) The amount may be determined on the basis of Rs. 25/- per faculty member, Rs. 10/- per University research scholar and Rs. 5/- per postgraduate student of the University, subject to a minimum of Rs. 15,000 /- and maximum of Rs. 80,000/-. The figures of the faculty members, research and postgraduate students are to be taken as on 15th of August of the previous year.

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(ii) For U.G.C. Unit, Rs. 10,000 /- may be sanctioned to a University having less than 50 affiliated colleges and Rs. 15,000/- to a university having 50 or more affiliated colleges.

e) The Universities may be allocated additonal funds for purpose of assisting college teachers to travel inside the country. The amount to be fixed for this purpose may be determined on receipt of information regarding the total number of colleges teachers/ postgraduate students/Under-graduate students in colleges affiliated to different universities.

f) During the Fifth Plan discussions, the State Governments may be asked to consider placing of such certain lump-sum amount as unass igned grant to the universities for matching share for th schemes to be covered under unassigned grant.

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UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976.

Item No. 19 To consider the question of expanding the scope of the Book Bank Scheme to cover the Post-graduate and professional colleges.

.....

During the Fourth Five Year Plan, the Commission introduced a scheme for providing assistance to colleges for setting up Book Banks with the specific purpose of making available books to deserving students on loan for the period of their studies. Under this scheme, Commission's assistance was available only to colleges having an enrolment of 500 or more students. The Commission decided to continue the scheme in the Fifth Plan for Arts, Science and Commerce Colleges on the same basis.

Subsequently the Commission at its meeting held on 14th July, 1975 considered the question of relaxing the condition of minimum enrolment in the case of colleges situated in backward and rural areas under the scheme of "Setting up of Books Banks in Colleges". (Item No. 22). The Commission agreed that colleges which have an enrolment of not less than 100 and not more than 249 in degree classes may also be assisted for establishing Book Banks. The assistance to such colleges will be limited to Rs. 8,000/- on the usual sharing basis (UGC's share Rs. 6,000 /-).

The Commission is at present assisting the colleges with students enrolment of 100 or above. The basis of financial assistance for setting up Book Banks in colleges is as follows :-

		Allocation	UGC's contribution
		Rs.	
i.	A college with a student enrolment of 100 or above but less than 250.	8,000/-	75% of the allocation.
ii.	A college with a student enrolment of 250 or above but less than 500.	10,000/-	
iii.	A college with a student enrolment of 500 or above but less than 1000.	15,000/-	
iv.	A college with a student enrolment of 1000 or above but less than 1500.	20,000/-	
v.	A college with a student enrolment of 1500 or above but less than 2000.	25,000/-	
vi.	A college with a student enrolment of 2000 or above.	30,000/-	

P.T.O.

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-:3:-

The Conference of the Vice-Chancellors convened by the Ministry of Education and the UGC from September 30 to October, 1,1975 considered the matters relating to Students Amenities programmes which inter-alia includes an item relating to Book Banks. An extract of the recommendations made in this respect by the Conference is reproduced below :-

1. Assistance given by UGC for establishment of Book Banks at present covers only undergraduate colleges. Since a large number of students in postgraduate faculties are also in need of such help, the Group recommended that the scope of scheme be extended to postgraduate and professional courses.

2. Some universities are experimenting with different ways of making textbooks available to the students particularly of the under-privileged classess, for example, the University of Allahabad organises a cooperative lending library with grants from the State Government through which students get a set of four books once every six months. Such experiments could be tried out on a wider scale.

3. Various possibilities of enriching the book banks may be explored; e.g. (a) The National Book Trust may donate adequate number of copies of appropriate titles to the book banks; (b) Text books and reference books in departmental libraries which are no longer required in the departments may be transferred to the book banks. (c) The students who pass out of colleges may also be requested to donate their books to the book banks.

The recommendations of the conference were considered by the U.G.C at its meeting held on 24th Nov. 1975. The Commission noted same & also desired that further action on specific items may be brought before the Commission.

It may be mentioned that the Commission has released the following grants to the colleges in respect of the above Scheme :-

1.	1974-75	Rs. 58,14,073
2.	1975-76	Rs. 96,43,306 (provisional subject to close of accounts as on 31.3.1976

The Conference of Vice- Chancellors have impressed that the scope of the scheme of Book Banks may be extended to the Postgraduate and Professional Colleges.

The matter is placed before the Commission for consideration.

AS(CP)/ Addl. Secy.

SLK

CONFIDENTIAL

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UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976.

Item No. 20 : To consider the suggestion to increase the amount of honorarium paid to awardees under the scheme 'USRT' by the Institution where the teacher works.

.....

The University Grants Commission under its scheme for the Utilisation of the services of retired teachers of outstanding merit has a provision for payment of an additonal honorarium upto a maximum of Rs. 4,000/- p.a. by the institution where the teacher works with prior approval of the Commission.

Dr. R.C. Paul. Vice. Chancellor, Panjab University, has suggested in a letter to the Chairman, UGC, that the Institution where the teacher works may be permitted to pay from its own funds, if it so desires, an additional honorarium upto a maximum of Rs. 9,000/- p.a. instead of Rs. 4,000/- p.a. as provided under the rules at present with the prior approval of the UGC. He has further stated that this will help the universities to avail of the services of capable retired teachers.

It may be pointed out in this connection that the Commission has with effect from 1st November, 1975 raised the amount of honorarium and contingency grant from Rs. 6,000/- p.a. to Rs. 9,000/- p.a. and Rs. 1,000/- to Rs. 2,000/- p.a. respectively paid to awardees under the scheme of 'USRT'.

The matter is placed before the Commission for consideration.

DS(ER)/AS(ER)

SLK

University Grants Commission

Meeting :
Dated : 29 April 1975

Item No 21: To consider proposals from Jawaharlal Nehru University for additional funds during the 5th Plan period.

1 The Jawaharlal Nehru University has submitted the following proposals for additional funds over and above those agreed to on the recommendations of the visiting committee which assessed the Fifth Plan requirements of the university. during the 5th plan period.

S.No.	Proposal	Amount Required
1	School of Theoretical & Environmental Sciences	Rs. 25,30,000
2	School of Life Sciences	Rs. 25,50,000
3	Computer & System Sciences	Rs. 18,55,000
4	Central Workshop and Instrumentation Laboratory Facility	Rs. 10,51,000
5	Augmentation of Water Resources for Horticulture purposes	Rs. 22,00,000
6	Vice-Chancellor's Residence	Rs. 1,25,700
7	Women's Hostel	Rs. 12,00,000
8	School Building	Rs. 25,80,000
	Total	Rs.140,91,700
	say	Rs. 140.92 lakhs

The list of equipments to be procured for various Schools is attached as Annexure I.

2. The university, while submitting these proposals made the following observations to justify their demands :

(i) School of Life Sciences

"The M.Phil programme was started in the School of Life Sciences in the year 1972 and the School embarked on the M.Sc. programme from 1975. The inter-disciplinary M.Sc. programmes initiated in the School of Life Sciences requires instructional/laboratory inputs in biophysics, biochemistry, molecular biology, microbiology, cell biology, radiation biology, physiology, genetics, evolution and tissue culture. It is, therefore, imperative that the laboratories in the above fields are equipped as expeditiously as possible so that the instructional/research programmes do not suffer further.

New faculty members have already been added in some of the above disciplines while some more are going to be inducted shortly. Though efforts to procure some instruments from abroad were initiated long back but due to procedural delays we have not yet been able to get these equipments. The existing laboratory facilities in the School are too meagre to cope with the newly initiated inter-disciplinary academic/research programmes being attempted for the first time in the country.

It may not be out of place to mention that the meagre allocation of Rs.7.50 lakhs sanctioned by the UGC on the recommendations of the Visiting Committee for the School of Life Sciences for the entire plan period has already been exhausted and the School is finding it extremely difficult to provide even functional laboratory facilities in some of the above mentioned fields of study. In case the School has to have the modest functional laboratory facilities in all the above fields of study, it would require a minimum additional grant of Rs.25 lakhs for setting up of the laboratories."

(ii) School of Computer and System Sciences

"The School of Computer & System Sciences of the university has already acquired a Bulgarian R-1020 Computer at a cost of Rs.26.5 lakhs. The Computer Centre is, however, considerably handicapped in the absence of adequate data preparation facilities which need to be strengthened as expeditiously as possible.

The Computer Centre of the JNU is planned to be a separate science orient Centre, offering computer facilities to all teaching and research departments of the university as well as to the Electronics Commission and outside users.

The school has identified equipments as per list attached, which are extremely essential for generating sufficient inputs to keep the computer busy.

It is needless to emphasise the immediate need of inducting the above machines as expeditiously as possible so that the Computer could be put to productive use to its optimum capacity.:

(iii) School of Theoretical & Environmental Sciences :

"The meagre financial allocation of Rs. 10.00 lakhs for procurement of equipment for the School of Theoretical & Environmental Sciences during the entir 5th plan period has made our task of developing the School well high impossible.

This amount has already been exhausted in procuring the barest minimum equipment for setting up of basic laboratories for the School and it has been le with vitrually nothing for setting up the working laboratories during the next three years of the 5th plan period."

(iv) Central Workshop and Instrumentation:

"A central facility for the university for various Schools will be provi and for this purpose, equipment and machinery as detailed in the enclosure will have to be procured. In the report of the Visiting Committee, a sum of Rs.10 la was ear-marked for various items required for the Central Workshop facility as also an animal house. On reviewing the detailed requirements, we find that a su of Rs. 10 lakhs would be required for the central workshop and instrumentation."

(v) Augmentation of existing water resources for horticulture purposes

"Our first phase requirements of water for horticulture purposes are about 4.5 lakh gallons per day for developing 100 acres of land at the rate of 4000 gallons per day per acre and watering 12500 trees at the rate of 4 gallons per tree per day.

At present we have 10 working tubewells and one open well in the campus with a total yield of about 1.5 lakh gallons. It is proposed to collect rain water by providing an earthen dam across the nala which is likely to give us about 90,000 gallons per day. The total yield would therefore be about 2.4 lakh gallons per day which considerably falls short of our first phase requirements. The construction of one tubewell and one open well for which as estimate has been submitted to the Commission would yield another 35,000 gallons per day which would be very helpful in augmenting the existing supply. For the balance requirement of about 1.75 lakh gallons feasibility of recycling sullage from the toilets of residences in the new campus is being examined.

Since proposals for augmentation of existing ground water resources for horticulture purposes were still at the initial stage at the time of preparing the original fifth plan proposals these could not be indicated earlier. The total cost of augmentation of the ground water supplies for horticulture purposes by constructing earthen dam, provision of one tubewell and one open well and recycling of sullage from the toilets is likely to be of the order of Rs.22.00 lakhs."

The break-up of the proposed expenditure of Rs. 22.00 lakhs is as under

1	Providing one additional tubewell and one open well	Rs. 3.84 lakhs
2	Construction of an earthen dam across a nala for collecting rain wanter	Rs. 15.71 lakhs
3	Construction of sedimentation and oxidation tank for recycling of sullage water from the toilets	Rs. 2.45 lakhs
		Rs. 22.00 lakhs

The detailed proposals for item No. 3 would be sent to the Commission shortly.

As the present position of adequate supplies of water for horticulture purposes in the campus is very acute, an expenditure of about Rs. 22.00 lakhs on development of the existing water resources is unavoidable. It is, therefore, requested that a further grant of Rs. 22.00 lakhs may kindly be sanctioned for expenditure on new works during the 5th plan in addition to the grant of Rs. 85 lakhs already sanctioned.

(vi) Second School Building:

The university has approached the Commission for their approval for the construction of the second school building at an estimated cost of Rs. 50.80 lakhs The university was advised to explore the possibility of phasing out the construction of second school building so that the expenditure on first phase as recommended by the Visiting Committee could be limited to Rs. 25 lakhs. The university intimated that the construction of the building in two phases would not be desirable for the following reasons :

(i) There would be considerable amount of disturbance to the users of the first phase construction while the second phase is in progress.

(ii) Construction of a complete building at one time is more economical.

(iii) An incomplete building does not present a pleasant architectural look.

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....4

The university has, therefore, requested the approval of the Commission to the preliminary estimate amounting to Rs.50.80 lakhs for the building.

(vii) Vice-Chancellor's Residence

"Since construction of Vice-Chancellor's residence in the university campus is of great importance, sanction of the Commission to the preliminary estimates amounting to Rs.1,25,700 may kindly be indicated at an early date. An additional grant to the above extent would be required over and above the 5th plan allocation already made for new building projects for the university."

(viii) Hostel for 300 women students

"Our requirements for hostels for women students during the 5th plan period would be for a minimum number of 500 students. Out of these we have already provided accommodation for 200 women students and our balance minimum requirements during the 5th plan period would be hostels for 300 students. We therefore propose to build a hostel for 300 women students during the remaining period of the plan. For this purpose we need an additional grant of Rs. 12 lakhs.

It is, therefore, requested that an additional grant of Rs. 12 lakhs to cover the construction of hostels for 300 women students in place of 200 included in Option-1 of New Building Projects may kindly be allotted."

3. In this connection the following observations are made :

(1) The Commission at its meeting held on 15th December 1975 considered the report of the Visiting Committee (Item 7) which assessed the 5th Plan proposal of the university and later on, while confirming the minutes of the meeting held on 15th December 1975 the Commission at its meeting held on 7 January 1976 resolv as under :

> "The Commission considered the report of the Visiting Committee appointed to assess 5th Plan proposals of Jawaharlal Nehru University. The Convenor (Shri KT Chandy) explained the financial constraints under which the Visiting Committee had to make allocations and suggested that in view ofthe large spill-over from the previous plan period, there is urgent necessity for some increase in the allocation to be made to this university for the 5th plan period. He also said that should this be possible, some more staff could be added with great advantage to the Schools of Life Sciences; Theoretical & Environmental Sciences; and Computer Sciences. After discussions, the Commission agreed to increase the allocation so as to provide some additional faculty positions in these Schools. Accordingly, the Convener was requested to allocate these additional positions.
>
> The Commission observed that it was for the university to ask for supernumerary positions, in accordance with the guidelines and that the Visiting Committee need not make provision for supernumerary positions. The finnacial implications of recommendations as finalised and accepted by the Commission are given in Appendix*."

The sanctions conveyed to the university are given in Annexure 2.

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* Kindly see Annexure 2

2, (2) As in the case of all universities, the Commission while conveying its sanctions to the university inter-alia also informed the university that the acceptance of the schemes is being communicated in the context of the resources likely to be made available to the Commission during the 5th Plan period. If, however, the resources position were to be improved during the plan period, the Commission could consider acceptance of other programmes contained in the Visiting Committee's recommendations in due course.

(3) The Visiting Committee which assessed the 5th five-year plan development proposals of the university inter-alia made the following observations/recommendations :

(i) On the basis of the report of its Academic Advisory Committee, the university decided to establish the following Schools of Studies :

(1) School of Life Sciences
(2) School of Social Sciences
(3) School of Languages
(4) School of International Studies
(5) School of Theoretical & Environmental Studies
(6) School of Computer & Systems Sciences
(7) School of Creative Arts

The university expected to make all the Schools functional during the 4th plan period, but due to various constraints, physical and financial, only 4 schools became functional.

(ii) The proposals made by the university required an outlay of Rs.10.42 crores as against an allocation of Rs. 6.00 crores made by the University Grants Commission. The university was to formulate its proposals under three priorities: 1st - 50%, 2nd - 25% and 3rd 25%. University made its proposals only under one head. The university during the 5th plan period proposes to make the remaining three projected schools of study functional besides expanding the academic and research activities of the four existing schools of study established during the 4th plan period.

(iii) School of Life Sciences

The basic concept on which the School is being developed is the unity of biology. Care has also been taken to provide the inputs of physics and chemistry though not of mathematics as yet. The research activities in the School are in the following broad areas of biology :

(a) Developmental Biology
(b) Photobiology
(c) Ethiology - including neurophysiology
(d) Radiation Biology
(e) Subcellular and Molecular Biology

A competent faculty has been assembled to deal with the above areas. However, the research activities are hampered due to lack of basic equipment.

(iv) School of Computer & System Sciences

The School of Computer and Systems Sciences is essential to support the educational and research programmes at the university. The areas of computer sciences and systems sciences are important both in terms of advancing our basic

understanding of many fields of human endeavour and in providing us with techniques of great power for these fields. The major thrust of this School should be in the area of information systems to support the inter-disciplinary studies of the university.

(v) School of Theoretical & Environmental Sciences

It was stated by the Vice-Chancellor that this School will be one of the major tasks of the university during the 5th Five-year plan period and the school will work in close collaboration with the environmental committee of the Government of India and the agency set up for this purpose by the Department of Science and Technology. The methodology of the study of the environment is not fully developed and the studies would require the inputs of biologists, physical and social scientists in particular anthropologists and mathematicians. The School will intract with the School of Life Sciences and the School of Social Sciences of the University.

The proposals for School of Environmental Sciences are basically sound. It is essential to study the lithosphere, hydrosphere and atmosphere and their interactions within themselves and their impact on man. The theoretical studies on environment and the experimentation studies, as outline in the proposals, need to be emphasised from the point of view of natural and man-made hazards, pollution problems vis-a-vis technological advances. The courses will broadly involve physicists, chemists, biologists, geologists, geophysicists, meteorologists, oceanographer and social scientists.

(vi) Central Facilities.

The university has made a proposal for setting up a Central Instrumentat Unit including workshop. The Committee suggests that the ;university may be assis for the setting up of a Central Instrumentation Laboratory and a separate workshop under the first priority. While recommending this, the Committee has taken note o the fact that the ;university has already established the School of Life Sciences, and its School of Theoretical and Environmental Sciences and School of Computer and Systems Sciences have already made a beginning. These central facilities will helpful to the Schools of the university.

(vii) Buildings

It would have been desirable if a perspective plan were prepared for developing the physical facilities of the university in line with the development its academic programmes, so that releases for a given period of time could be made according to fund poisition against the perspective plan. The university has not presented such a plan. In the opinion of the Committee, there is no doubt that th proposals put forward by the university for certain buildings are generally on right lines; but for want of funds, all these proposals cannot be contained in the ;funds that can be made available during the current plan period.

4. The Commission has conveyed its approval to the construction of the buildings in two alternatives as indicated below..

S.No.	Building	Approved allocation (Rs. in lakhs)	
1.	Hostel for 200 women students	25.00	
2.	Residence for 36 faculty members	25.00	
3.	Library building	10.00	
4.	School building	25.00	85.00
	OR		
1.	Hostel for 300 women students	31.00	
2.	Residence for 36 faculty members	25.00	
3.	Library building	15.00	
4.	Married students hostels	14.00	85.00

The proposals originally made by the university are given in Annexure.4.

The university has decided to accept option number one in which there is a provision of Rs.25 lakhs for the construction of the school building, and Rs.25.00 lakhs for a women's hostel for 200 students.

5. A comparative position with regard to the proposals originally made by the university, the grants recommended by the committee under 1st, 2nd & 3rd priorities, the total of the recommendations, the grants already sanctioned and the proposals now made are given in Annexure 3 from where it appears that the overall position of the original proposals, recommendations of the committee and the proposals now made is as under:

S.No.	School	Original proposal	Total recommendation of the Committee	Sanctions already made	Additional requirements
		Rupees in lakhs			
1	Life Sciences	20.00	17.00	7.50	25.50
2	Theoretical & Environmental Sciences	20.00	20.00	10.00	25.30
3	Computer & System Sciences	24.50	40.00*	10.00	18.55
4	Central Instrumentation facilities including workshops	5.00	10.00	10.00	10.51

* including computer

The position with regard to the other proposals now made by the university vis-a-vis the recommendations of the committee as accepted by the Commission is summarised below :

S.No.	Proposal	Recommendations of the committee	Proposals now made by the university for additional funds (Rs. in lakhs)
1	Augmentation of water resources	Not included in the proposals by the university	22.00
2	Vice-Chancellor's residence	Not recommended	1.26*
3	Women's hostel	200 students. Rs. 25.00 lakhs	12.00

*Original proposal made by the university required a sum of Rs.0.80 lakhs

6. The Visiting Committee in its report also observed that :

"There is a spill over expenditure of Rs.322 lakhs for buildings and other campus development projects. In view of such a sizeable spill over, which accounts for more than 50% of the Rs. 6 crores earmarked for the university, it has not been possible to work on any basis other than the total amount of Rs. 6 crores would be available to the university as first priority during the current plan period. Even this has not been possible without seriously cutting down on the pace of development. Construction of additional buildings for schools of the university and of some hostel and residential facilities is unavoidable. The Committee has not included the cost of the computer estimated at Rs. 20 lakhs in its computations. It is assumed that this amount will be available separately. A release of Rs.12.5 lakhs has been made for the purchase of basic equipment and books. The amount has also to be adjusted against the various grants recommended for school and library. This being a university under development, with some major new schools being just started, it is not possible to approach the financing of its development on the basis on which established universities could be approached. We have no doubt that the Commission is fu-ly conscious of this fact and that will take this into consideration in deliberating on our recommendations:"

7 The Commission in its meeting held in March 1976 was informed under Item No. 33 dealing with the budget estimates for 1976-77 under plan that the Government of India has informed that subject to the vote of the Parliament, an additional sum of Rs. 400 lakhs would be provided for the development schemes. While suggesting the addition of Rs. 400 lakhs the Government of India have informed that enhanced provision has been proposed inter alia on account of the following :

- Development of Jawaharlal Nehru University and North Eastern Hill University. Rs. 200 lakhs

8 In case the proposals of the Jawaharlal Nehru University are accepted this would involve a financial outlay of Rs. 140.92 lakhs.

		Rs. in lakhs
1	Equipment for 3 schools	69.35
2	Central Workshop and Instrumentation	10.51
3	Augmentation for water resources	22.00
4	Vice-Chancellor's residence	1.26
5	Women's hostel	12.00
6	School Building	25.80
	Total	140.92

9 The matter regarding additional funds to the Jawaharlal Nehru University during the 5th plan period for the purpose of construction of women hostel is placed before the Commission

A.S(D5)/D.S(D5)

ANNEXURE 1

List of equipment for Schools/Central facilities

School of Theoretical & Environmental Sciences

1		Tentative Price
1	Atomic Absorption Spectrophotometer	Rs. 2,00,000
2	Infra-red and uv. spectrophotometer	Rs. 80,000
3	X-ray units	Rs. 3,00,000
4	Mossbuer and Multi-channel Analyser	Rs. 3,00,000
5	N.M.R. unit to study Bio-physics in an inter-disciplinary way using solid state physics	Rs. 5,00,000
6	For physiological studies a good Polygraph is an essential component	Rs. 5,00,000
7	Scanning plus transmission type Electron Microscope	Rs. 6,50,000
	Total	Rs.25,30,000

School of Life Sciences

S.No.	Equipment	Price in Rupees
1	Ultracentrifuge with retorts	Rs. 3,50,000
2	UV Spectrophotometer (Gilford)	Rs. 2,50,000
3	Deep X-Ray Plant (150-200 KVP)	Rs. 3,00,000
4	LKB Ultramicrotome with accessories and Cryostat microtone	Rs. 2,00,000
5	Inverted microscope with Cinemetography attachment with accessories	Rs. 1,00,000
6	Leitz orthomat microscope with fluorescence interference, polarizing attachments and other accessories	Rs. 1,50,000
7	Miscellaneous equipment for M.Sc. teaching to be procured from abroad	Rs.12,00,000
	Total	Rs.25,50,000

School of Computer & System Sciences

S.No.	Equipment	Quantity	
1	Key Punches	4	Rs. 2,20,000
2	Verifier	1	Rs. 60,000
3	Sorter	1	Rs. 25,000
4	Reproducer	1	Rs. 5,75,000
5	Listing/Tabulating machine corresponding to IBM 407	1	Rs. 5,00,000

S.No.	Equipment	Quantity		Price	
6	Discs	10	Rs.	10,000	
7	Tapes	50	Rs.	15,000	
8	XY Plotter	1	Rs.	1,50,000	
9	Plato Unit including the Mini Computer Nove-1200	1	Rs.	3,00,000	
			Rs.	18,55,000	
Central Workshop & Instrumentation	A. Mechanical Workshop				
1	Univ. Milling Machine	1	Rs.	2,50,000	
2	Lathe Machine (1000 mm)	1	Rs.	43,000	
3	Mechanician's Lathe (500 mm)	1	Rs.	9,000	
4	Pillar Drilling machine	1	Rs.	8,000	
5	Bench drilling-cum-tapping machine	1	Rs.	6,000	
6	Grinding machine	1	Rs.	5,000	
7	Hacksawing machine	1	Rs.	8,000	
8	Shaping machine	1	Rs.	20,000	
9	Wood working machines	1 set	Rs.	20,000	
10	Vices, small tools, etc	lot	Rs.	15,000	
11	Air compressor	1	Rs.	15,000	
12	Vaccum pump	1	Rs.	10,000	
13	Portable electric tools	lot	Rs.	20,000	
14	Workshop benches, furniture, lockers, etc	lot	Rs.	30,000	
15	Electric connections, controls, foundations, etc.	lot	Rs.	40,000	
16	Welding machinery		Rs.	12,000	
		sub-total	Rs.	5,11,000	5,11,000
B. Electronics/Solid state laboratory & workshop					
1	Oscilloscopes	2 sets	Rs.	75,000	
2	Multimeters, ammeters, frequency meters, voltmeters	lot	Rs.	25,000	
			Rs.	1,00,000	1,00,000
C. Glass Blowing facility					
1	Misc. machinery		Rs.	20,000	20,000
D. Gas Plant					
1	Central Plant with piping and loo burners		Rs.	2,00,000	2,00,000
E. Stand by generator 60 KW			Rs.	1,50,000	
F. Thin film depositing machinery			Rs.	50,000	
G. Regrigeration equipment servicing machinery			Rs.	10,000	
H. Instrument repairing facilities			Rs.	10,000	
			Rs.	2,20,000	2,20,000
				G.T.	10,51,000

Annexure 2 (133)

Jawaharlal Nehru University

(Approved allocation - 5th plan period)

a) 1st Charge

Spill-over	Rs. 322.00 lakhs	
Basic grants	Rs. 12.50 lakhs	
Schemes already approved	Rs. 23.00 lakhs	*
Total	Rs. 357.50 lakhs	

b) New allocations

i) Non-recurring and Misc.

Books	Rs. 27.75 lakhs
Equipment	Rs. 36.75 lakhs
Furniture	Rs. 5.95 lakhs
Building	Rs. 85.00 lakhs
Miscellaneous	Rs. 38.00 lakhs
Total	Rs. 193.45 lakhs

ii) Recurring

a) Faculty & Technical Staff

30 Professors
29 Associate Professors
41 Assistant Professors
25 Others

b) Administrative & Supporting staff - including Deputy Librarian, 3 Assistant Librarians, 3 Semi Professional Assistants -- Rs.16.00 lakhs (for plan period)

c) Fellowships/Scholarships -- Rs.15.00 lakhs (for plan period)

* This excludes Rs. 20 lakhs already approved and paid for installation of computer

S.No.	School	Proposals originally made by the University	Recommendations of the Committee 1st	2nd	3rd	Total
1	Life Sciences	20.00	7.50	5.00	5.00	17.00
2	Theoretical & Environmental Sciences	20.00	10.00	5.00	5.00	20.00
3	Computer & System Sciences	24.50	30.00#	5.00	5.00	40.00
4	Central Instrumentation facilities including workshops	5.00	10.00@	-	-	10.00

* Excluding the cost of the computer

\# Includes Rs. 20 lakhs for the computer

** The Commission has already accepted the pla
the animal house at an estimated cost of Rs

@ This recommendation icnludes the central ph
laboratory, animal house, tissue culture ce
central instrumentation facilities and work

Annexure 4 (135)

1 The university made a provision of Rs.690 lakhs for buildings in its 5th five year plan proposals which were considered by the committee/ Commission. This included the spill over schemes of the 4th plan also.

2. The 5th plan proposals made by the university included the construction of the following buildings :

1	Hostel	1200 units
2	Residence for faculty members	156 units
3	staff quarters	530 units
4	Misc. buildings :	

Vice-Chancellor's house; guest house and faculty club; stadium, open air theatre, nursery & primary school, shopping centre (extension of the existing unit), children club and creshe and health centre

5	School and library building
6	Rector's residence

Proposals have also been made for the construction of a higher secondary school under the joint auspices of Jawaharlal Nehru University, I.I.T. and NCERT.

3 The Commission had agreed to the construction of the open air theatre building and the health centre building prior to the visit of the committee.

CONFIDENTIAL (136)

UNIVERSITY GRANTS COMMISSION

Meeting:

Dated : 29th April, 1976

Item No. 22 : To consider the proposal of Dibrugarh University for the introduction of Post-graduate course in Petroleum Technology.

The Ministry of Education and Social Welfare received a proposal from the Dibrugarh University seeking assistance towards Post-graduate Diploma course in Petroleum Technology.

The Ministry of Petroleum strongly feels that assistance should be provided to the Dibrugarh University in developing the course suitably in view of the estimated manpower requirements. The Ministry of Petroleum is ready to meet the legitimate non-recurring cost estimated at Rs.70.40 lakhs towards the course. The Ministry of Education/U.G.C. should arrange for meeting in recurring cost of the proposal, which may be about Rs.6.50 lakhs per annum.

The Dibrugarh University has been conducting a postgraduate diploma course in Petroleum Technology since 1969 and is offering the courses in (i) Exploration and development (ii) Refining and Petro-chemicals.

The financial implications in the proposal are to the tune of Rs.76.90 lakhs as detailed below :-

Non-recurring	Rs.70.40 lakhs
Recurring.	Rs.06.50 lakhs.
Total :	Rs.76.90 lakhs

The copy of the letter received from the Ministry of Education alongwith the detailed estimates is at Appendix-

The Ministry of Education and Social Welfare have asked for Commission's views/comments, and also enquired if the U.G.C. would meet the recurring expenditure out of their annual plan budget. In case the proposal is accepted in principle, the details of the development requirements covering both non-recurring and recurring items of expenditure may have to be assessed by a Committee. In case it is agreed to provide Recurring grant by the Commission in State Government

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would have to give an assurance to treat this as committed expenditure after this Commission assistance ceases.

The matter is placed before the Commission for consideration.

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Appendix- fb Item No.22

Copy of Government of India, Ministry of Education & Social Welfare (Deptt. of Education) letter No.F.16-77/71-T.2. dated 17th March, 1976 to the Secretary, University Grants Commission, New Delhi.

-.-.-

Sub:- Proposal of the University of Dibrugarh for introduction of P.G. Diploma course in Petroleum Technology.

Sir,

I am directed to invite your kind attention to the correspondence resting with this Ministry's letter of even number dated the 21st October, 1972, on the above noted subject and to say that a proposal of the Dibrugarh University was received earlier in this Ministry for assisting their P.G. Diploma course in Petroleum Technology. On the advice of the Ministry of Petroleum that it would be unwise to start a fresh course in subject, the proposal of the University was not persued.

2. The University is however conducting a P.G. Diploma course in Petroleum Technology and is offering two courses (i) Exploration and development (ii) Refining and Petro-chemicals since 1969.

3. The Minister for Petroleum made a statement in both the Houses of the Parliament in May, 1975 inter alia in the sphere of Petroleum Technology, the Dibrugarh University of Assam also have a P.G. Course in Petroleum Technology and it was proposed to assist the University in developing this course suitably in view of the estimated manpower requirements. In view of this commitment, the Ministry of Petroleum strongly feels that assistance as promised to the Univers ity should be provided. The Ministry of Petroleum & Chemical is ready to meed the legitimate non-recurring cost of strengthening of the course i.e., Rs. 70.40 lakhs after the comments of this Ministry on the assessed amount for non-recurring component and that Ministry of Education and the University Grants Commission should arrange for meeting the recurring cost of the proposal (i.e., Rs.6.50 lakhs). A statement showing the break of the expenditure is enclosed.

4. It is therefore requested that your views/comments on the above may please be communicated immediately. It may also please be indicated if the University Grants Commission would meet the recurring expenditure out of their annual Plan Budget.

Enclosure

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Tentative estimate of Expenditure to buildup the deptt. of Petroleum Technology, Dibrugarh University, Dibrugarh (Assam)

STATEMENT SHOWING THE DETAILED BREAK-UP OF FINANCIAL IMPLICATION INVOLVED IN THE PROPOSAL.

A. Non-Recurring.

i)	Building (Two Storeyed, R.C.C.type) (This deptt. has not building of its own).	Rs. 10.00 lakhs.
ii)	Laboratory equipments/chemicals and materials. (This amount will be required for a period of five years)	Rs. 50.00 lakhs.
iii)	Furniture and fittings.	Rs. 1.50 lakhs.
iv)	Books, Journals and back volume of the journals.	Rs. 2.50 lakhs.
v)	Miscellaneous.	Rs. 6.40 lakhs.
	Total:	Rs. 70.40 lakhs

B. Recurring.

i) Staff salary

a)	Professor (1)	Rs. 30,000-00
b)	Readers (2)	Rs. 45,600-00
c)	Lecturers (8)	Rs.1,53,000-00
d)	Laboraoty Assistants (2)	Rs. 19,200-00
e)	Technical/Research Asstt. (2)	Rs. 19,200-00
f)	Librarian I/C (1)	Rs. 9,600-00
g)	Typist (1)	Rs. 4,800-00
h)	Store Asstt. (1)	Rs. 4,800-00
i)	Lab. attendent (2)	Rs. 7,200-00
j)	Peons (2)	Rs. 6,000-00
k)	Chowkidar (1)	Rs. 3,000-00
l)	Sweeper (1)	Rs. 3,000-00
	Total :	Rs.3,05,400-00

ii)	Laboratory equipment, chemicals and materials.	Rs. 2,00,000-00
iii)	Books, current volumes, Back volumes.	Rs. 50,000-00
iv)	Scholarships to student and Research scholars.	Rs. 28,000-00
v)	Miscellaneous.	Rs. 66,600-00
	Total:	Rs. 6, 50,000-00

Non-Recurring	Rs. 70 .40 lakhs
Recurring.	Rs. 06.50 lakhs
Total :	Rs. 76.90 lakhs

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UNIVERSITY GRANTS COMMISSION

Meeting :

Dated : 29th April, 1976.

Item No. 23 : To consider the proposal of the Rajasthan University for the Construction of a building for the Institute of Correspondence Courses.

.....

In March, 1968 the Commission accepted the proposal of the Rajasthan University for the introduction of Correspondence Courses at B.Com. level, and agreed to provide a grant of Rs. 5 lakhs (ceiling) over a period of four years. It was expected that the scheme would become self-supporting at the end of this period. The University of Rajasthan introduced Correspondence Courses for B.Com. in 1968-69. Our assistance towards the programmes ceased in 1971-72. Only an amount of Rs. 75,000/- was paid to the University upto March 1972 on this account on not deficit basis.

In December 1970, the University approached the Commission with a proposal to put up a building for Correspondence Courses at an estimated cost of Rs. 5,00,000/- and requested that the University be permitted to utilise Rs. 3 lakhs out of the afore said grant of Rs. 5 lakhs for the purpose and also provide an additional ad-hoc grant of Rs. 2 lakhs. The construction of the building was given priority by the University in view of the fact that the University had been spending Rs. 12,000/- annually towards the rent of a building for the Institute.

The University was informed that the assistance of the Commission for buildings for Correspondence Courses is on 50: 50 basis. The University was accordingly requested to indicate if it was willing to share the estimated expenditure of Rs. 5,00,000/- on 50:50 basis, and if so, it might send the plans and estimates of the building for the approval of the Commission.

In the initial stage the University was not in a position to meet 50% share, but with the introduction of post-graduate courses and the savings accrued during the year 1971-72 and 1972-73 to the tune of Rs. 3.37 lakhs, the University agreed to meet 50% of its share in the estimated cost of the building i.e. Rs. 7.21 lakhs from the savings of the post-graduate courses and from its own funds.

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The visiting Committee appointed by the University Grants Commissio for quantum of assistance for postgraduate correspondence courses was requested to discuss the proposal of the University for the construction of a building for the Institute of Correspondence Courses with the university authorities. The Committee made the following observations in its report :-

> " The Institute of under-graduate and Post-graduate studies in the University of Rajasthan are at present housed in rented buildings. The need for a permanent building for the Institute is therefore apparent."

The Commission at its meeting held on 10th March 1976 considered the report of the Committee and desired that it may be referred to a visiting Committee which will be visiting the Rajasthan University to assess its Fifth Plan proposals. The visiting Committee has generally endorsed the recommendations of the Expert Committee. The Commission at its meeting held on 24/25th November 1975 also generally accepted the recommendations made by the Visiting Committee.

In view of the recommendation of the Expert Committee which were endorsed by the Visiting Committee and also accepted by the Commission, and also the fact that the Committee has visualised the Genuine need of the University for a building for the Institute of Correspondence courses it is for consideration whether we may accept the proposal of the University for the Construction of a building for the the Institute of Correspondence Courses on 50:50 sharing basis subject to the condition that our assistance would be limited to a ceiling of Rs. 5 lakhs including the grants already paid to the University for Correspondence Courses.

The revised estimated cost of the building including services is Rs. 6 lakhs. Pending approval by the University Grants Commission the University started construction of the building, which is now at the plinth level. It may be mentioned in this connection that before a finalisation of the guidelines for the introduction of Correspondence Courses, building for the purpose were approved by the University Grants Commission on the merits of each case.

The matter is placed before the Commission for consideration.

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UNIVERSITY GRANTS COMMISSION

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Meeting :

Dated : 29th April, 1976

Item No. 24 : To consider the amendment proposed by the University of Delhi to its Ordinance relating to Visiting Professors or Lecturers.

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The Government of India in the Ministry of Education & Social Welfare have invited the comments of the University Grants Commission on the amendment proposed by the University of Delhi to its Ordinance XII-A of the Ordinances of the university relating to Visiting Professors or Lecturers. The original clause and the amended clause as adopted by the university are given below :-

Original Ordinance	Ordinance as amended
Persons invited as Visiting Professors or Lecturers may be paid such salary, Honorarium, travelling expenses, hospitality, etc., as may be decided in each case by the Vice-Chancellor, provided that a Visiting Professor from abroad may be paid a salary upto Rs. 2000/- p.m. plus travelling expenses as may be fixed by the Vice-Chancellor in ach case.	Persons invited as Visiting Professors or Lecturers may be paid such salary, honorarium, travelling expenses, hospitality etc., as may be decided in each case by the Vice-Chancellor, provided that a Visiting Professor from abroad may be paid a salary upto Rs. 3000/- p.m. plus travelling expenses as may be fixed by the Vice- Chancellor in each case.

2. The university has given the following justification for the proposed amendment :-

"Under the existing provisions, persons invited as Visiting Professors or Lecturers were paid such salary, honorarium, travelling expenses, hospitality etc. as may be decided in each case by the Vice-Chancellor, provided that a Visiting Professor from abroad was paid a salary upto Rs. 2000/- plus travelling expenses as was fixed by the Vice-Chancellor in each case. This amount of Rs. 2000/- was fixed when the pre-revised scale for the professors in the University was Rs.1100 - 1600 with provision for a senior grade of Rs. 1600-1800. Now that the scale of pay for professors in the University has been revised with a maximum of Rs. 2500 p.m., it appears logical that the amount of salary payable to a Visiting

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Professor invited from abroad should also be raised suitably. The Council has therefore decided to increase the salary of a Visiting Professor from abroad at Rs. 3000/- p.m. Necessary amendment to clause 3 of the Ordinance XII-A has been made accordingly."

In this connection the following observations are made :-

The Commission in 1957 informed the Universities that the following conditions shall apply to any appointment of Visiting Professor for which grants may be paid by the Commission:-

1. A Professor should be an eminent scholar in his subject.

2. The maximum tenure of the Professor be one year and minimum three months.

3. The Professor be paid a consolidated salary of Rs. 2000/- per month plus return air passage at first class rates.

4. The Income Tax payable by the Professor during his stay in India be borne by the University.

5. A sum of Rs. 500/- be paid for meeting any incidental expenses.

The Commission later in 1963 informed the universities that the procedure of exempting Visiting Professors as earlier agreed to by the Commission for payment of income tax on their salary was not proper and should be discontinued. The Universities were also informed that the terms and conditions pertaining to the appointment of Visiting Professors (From abroad) may be determined on the merit of the case and in exceptional cases a net emolument (inclusive of house rent and allowances, if any) upto Rs. 2,000/- per mensem after deducting income tax etc. may be given. It was also agreed that the practice followed under the Colombo Plan of paying visiting teachers air-fare by economy class instead of first class fare be adopted.

In 1972, the Commission desired that the following guidelines may be kept in view for considering cases of "Visiting Appointments" in the Universities:

(1) The duration of visit ordinarily should not be less than 2-weeks and should not exceed four months in a year;

(2) The travel expenses would be met by the host institutions;

(3) In the case of a person receiving his salary from the "parent institution" for the period of the visit the "host institution" would provide hospitality including board and lodging and pay an honorarium not exceeding Rs. 1,000/- per month.

(4) In the case of a person not receiving his salary from the "parent institution " for the period of the visit, the "host institution" would pay a salary not exceeding Rs. 2,000 per month.

In the case of "Visiting Fellows" appointed in the Centres of Advanced Study, the Commission had agreed that such appointments

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should not be generally less than three months and exceed one academic year of 12 months at the most and that the honorarium/salary ranging from Rs. 1500 to Rs. 2,000 p.m. may be paid depending upon the academic standing of the person to be invited as a 'Visiting Fellow'.

In view of the revised scales of pay now introduced, it is for consideration if the conditions for appointment of "Visiting Professors" both from India and abroad may be revised, and whether the basis for such Professors from India or abroad be different the amended Ordinance of Delhi University is also for the consideration of the Commission.

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UNIVERSITY GRANTS COMMISSION

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Meeting:

Dated : 29th April, 1976.

Item No.25 : To consider the proposal of the Gujarat University for setting up a department of Commerce.

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The Vice-Chancellor Gujarat University has drawn the attention of the University Grants Commission to the situation which compels the University to open a University department of Commerce to provide for Postgraduate courses in that subject from the academic year 1976. A copy of the letter is given in Annexure I. The University at present has no Post-graduate Department of Commerce. The M. Com. classes are conducted in four affiliated colleges at Ahmedabad. The total strength of students in these Post-graduate Centes at Ahmedabad is 880 (Part I 450 + Part II 430 = 880). Under the present system in the Gujarat University of having the post-graduate Centres at several colleges, the centres are run for and on behalf of the Gujarat University at the colleges, where recognised post-graduate teachers are invited to deliver lecturers on payment @ Rs.20/- per lecture + T.A. and D.A. where necessary.

Consequent upon the implementation of the revised pay scales for teachers of universities and colleges in Gujarat, the Vice-Chancellor has stated that the teachers will not be additionally remunerated for doing post-graduate work as per Government of Gujarat orders. As such the teachers will not be inclined to conduct the Post-graduate classes. Neither the Principal of the College nor Professor-Incharge of the University has authority to compel them to take the Post-graduate classes. With this position a peculiar situation has arisen which demands that the post-graduate teaching in Commerce for M.Com will have to be provided at the University from next June onwards. The University has also stated that there is no provision for Ph.D. in Commerce and with the new pay - scales requiring the teachers to acquire a post-M.Com. degree- either M.Phil. or Ph.D. during the next five years, some provision for M.Phil. and Ph.D. will also have to be made. Both these provisions can be made if a postgraduate Department of Commerce is started at the University.

The University has therefore sent a proposal for starting the post-graduate Department in Commerce in the University with the provision of following staff :-

1. Professor
2. Readers
3. Lecturers.

which could involve an expenditure of about Rs. 95,000 p.a. i.e. about Rs.2.50 lakh during the Fifth Plan period.

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The University will not require any assistance for the accommodation of the proposed department as it will be housed in the existing buildings of the University.

The Visiting Committee which assessed the V Plan proposal of the Gujarat University has recommended a provision of Rs. 6 lakh for courses in Commerce and Law, in the IIIrd Priority owing to limitation of resources.

The matter is placed before the Commission for consideration.

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Annexure to Item No. 25 (147)

Copy of Gujarat University letter No.D.O.V.C./PG/37395/1976 dated 25/26th March 1976/addressed to Secretary, University Grants Commission New Delhi.

/ from the Vice- Chancellor

Subject : A Postgraduate Department of Commerce, Need for....

.....

A very embarrassing and unexpected situation has developed as a result of the Education and Labour Department Resolution No.Mis-1075/4947-KH dated 23rd February 1976 (copy enclosed) *issued by the Gujarat State Government sanctioning the Fifth Five-year Plan scales (Sen scales) for teachers of Universities and Colleges in Gujarat. One of the conditions laid down by the State Government in this behalf is that henceforth additional remuneration shallnot be paid for postgraduate work (condition No. 8, page 6 of the G.R.). What it means is that the postgraduate work will now be considered to be an integral part of the work that could be assigned to teachers in the colleges, as the existing system in the Gujarat University, is of having Postgraduate Centres at several colleges under the University. The Centres are being run for and on behalf of the Gujarat University at the colleges, where recognised postgraduate teachers are invited for postgraduate lectures and they are being paid for this work at Rs. 20/- per lecture plus T.A. and D.A. wherever necessary. The peculiar situation is that even those teachers who got postgraduate scales of Rs.700-1100 during the Fourth Plan period, were also being paid accordingly. The total cost in this behalf at the Gujarat University comes to about a million rupees.

Now that the teachers have come to know that the postgraduate work will not be additionally remunerated, they are not inclined to engage the postgraduate classes and the Principal or the Professor-in-charge or the University has no authority to compel them to take the classes. So far as the University Schools of Languages, Social Sciences, Sciences and Psychology-Philosophy- Education, etc. are concerned, we can very easily take a stand that wherever the teachers are not prepared to take the postgraduate classes, these Centres may be discontinued and the students can come to the University Departments in Ahmedabad. But a peculiar position exists with regard to M.Com. inasmuch as the University has no Postgraduate Department of Commerce but the M.Com. classes are being conducted in four colleges at Ahmedabad. The total strength of students in these Postgraduate Centres at Ahmedabad is 885 (Part I 450 plus Part II 430 = 885). This means that the postgraduate teaching in Commerce for M.Com. will have to be provided at the University from next June onwards; otherwise a catastrophe will be created. There is no provision for Ph.D. in Commerce and with the new pay-scales requiring the teachers to acquire a post-M.Com. degree - either M. Phil. or Ph.D./ will also have to be made. Both these provisions can be made if, a Post-graduate Department of Commerce is started at the University.

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/ during the next five years, some provision for M.Phil. & Ph.D.

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With one floor of the School of Social Sciences vacated by the Departments of Psychology, Philosopy and Education having moved to their own building, and the new M.B.A. building being ready, we may not need any non-recurring provision for building, furniture, etc. for this new Department of Commerce. The only provision needed will be staff for the new Department of Commerce. Looking to the number of students I propose that one Professor, two Readers and three Lecturers may be sanctioned immediately so that the posts can be filled before the commencement of the next academic year in June 1976.

In our Fifth Plan proposals we included a Postgraduate Department of Commerce, but the same has been accepted in third priority by the Visiting Committee of the U.G.C. However, the Committee has recommended a amount of Rs. 15 lakhs for improvement/consolidation of Commerce at the University will be a step in the right direction for improvement of postgraduate instruction in Commerce.

In this contest, I would request you to move the Commission to agree to sanction one Professor, two Readers and three Lecturers, which would mean in terms of expenditure as under:

One Professor	- Rs. 22,500:00
Two Readers	- Rs. 36,900:00
Three Lecturers	- Rs. 35,226:00
	Rs. 94,626:00

I shall thank you for an early action in this regard.

With kind regards.

/ instructions at the Post-graduate Centre. Setting up a Department of

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UNIVERSITY GRANTS COMMISSION

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Meeting :

Dated : 29th April, 1976.

Item No. 26 :To consider the question of reviewing the policy of awarding scholarships at the honours and Master Degree level in Arabic, Persian, Sanskrit, Pali and Prakrit.

.....

a) On the recommendation of the Review Committee for Arabic and Persian studies in universities the Commission instituted the scheme for the award of scholarships for honours and Postgraduate studies in Arabic and Persian from 1965-66. 210 scholarships have been awarded so far during the past eleven years as indicated below :-

Year	Applications received				Total	Awards made				Total
	Arabic		Persian			Arabic		Persian		
	Hons	PG	Hons	PG		Hons	PG	Hons	PG	
1965-66	10	14	14	21	59	6	4	3	7	20
1966-67	9	19	19	34	81	2	5	3	6	16
1967-68	11	22	17	21	71	4	3	4	5	16
1968-69	19	17	22	21	79	5	3	4	5	17
1969-70	12	13	7	15	47	5	6	3	5	19
1970-71	21	14	10	18	63	6	8	6	3	23
1971-72	10	23	11	20	64	4	9	3	5	21
1972-73	26	41	17	26	110	5	7	2	4	18
1973-74	26	30	11	10	77	4	9	4	4	21
1974-75	12	16	13	7	43	4	5	6	4	19
1975-76	22	20	14	8	64	3	10	4	3	20

The value of scholarships for honours as well as post-graduate studies is Rs. 1200/- per annum and Rs. 1800/- per annum, respectively. Candidates who have got oriental degrees and wish to go in for honours or post-graduate studies in a university or institution approved under the University Grants Commission Act are also eligible for award of scholarships in Arabic/Persian.

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b) In pursuance of the Commission's decision taken at its meeting on 7th October, 1970 (item No. 10), a Committee was constituted to consider the question for the Institution of a scheme for the award of scholarships for honours and postgraduate studies in Sanskrit and Allied subjects, on the pattern of scholarships for Arabic and Persian studies. On the recommendations of this Committee the Commission at its meeting held on 3rd February, 1971 (item No. 41) agreed that 20 scholarships of the value of Rs. 150/- may be instituted for the postgraduate studies in Sanskrit/Pali/Prakrit. The Commission has, so far, awarded 109 scholarships for the postgraduate studies in Sanskrit/Pali/Prakrit, the details of which are given below :-

Year	Applications received				Total award made		
	Sanskrit	Pali	Prakrit	Total	Sanskrit	Pali	Prakrit
1971-72	277	11	4	292	17	-	2
1972-73	132	10	1	143	22	2	-
1973-74	104	1	2	107	21	1	1
1974-75	96	-	-	96	20	-	-
1975-76	67	3	-	70	21	2	-

The Commission agreed at its meeting held on 22nd March, 1976 that the value of the Scholarships may be revised as follows with effect from the next academic year:

a) Scholarships instituted by the University Grants Commissior for pursuing M.A./M.Sc courses :- From Rs. 150 per month to Rs. 250/- per month.

b) Scholarships for honours courses instituted by by the University Grants Commission :- From Rs. 100 per month to Rs. 150 per month.

The matter is placed before the Commission.

AS(RF)/Addl. Secretary.

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UNIVERSITY GRANTS COMMISSION

Meeting:

Dated : 29th April, 1976.

Item No. 27 :To receive a note on implementation of the revised scales of pay and the conditions attached to these i.e. minimum qualifications, examination, renumeration and code of conduct in different States.

.....

The University Grants Commission at its meeting held on 16th February, 1976 during the general discussion desired that a note regarding the manner of implementation of the revised scale of pay in different States and the conditions etc., attached to the implementation of the scales of pay may be brought up before the Commission. The position in this respect is detailed below :-

The Government of India, Minsitry of Education and Social Welfare on the recommendations of the University Grants Commission approved the revised scales of pay in respect of universities/college teachers. A statement indicating the existing and the revised scales of pay in respect of Central Universities/State Universities/Colleges are attached. (Appendix-I (i) (ii).

2. The revision of scales of pay of university and college teachers for payment of Central Assistance was subject to the conditions communicated by the Government of India to the State Governments. A copy of the conditions for introduction of the revised scales of pay is enclosed (Appendix-II).

3. A note indicating the position regarding the implementation of the revised scales of pay by State Governments as received from the Government of India, Ministry of Education and Social Welfare is enclosed. (Appendix-III).

4. The Government of India, Ministry of Education intimated to the State Governments the qualifications prescribed for recruitment to the post of Lecturers consequent upon the revision of scales of pay as recommended by the University Grants Commission. An extract from the letter addressed to the State Government in this respect is enclosed. (Appendix-IV). The State Government of India, Ministry of Education with regard to the clause "Consistantly good academic record" of the candidate for appointment to the post of Lecturer in the Universities/colleges. The matter was considered by the Commission on a reference from the Ministry of Education at its meeting held on 7th January, 1976. The Commission recommended that for recruitment to the post of Lecturer, a Lecturer must have a first or high 2nd class (B+) at the Masters level and for determining consistantly good record

ought further
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average of 50-55% may be expected in the two examinations prior to the master's degree. The decision of the Commission in this respect was conveyed to the Government of India, Ministry of Education and Social Welfare which is still under their consideration.

5. On a representation from the Delhi University the Commission decided that the minimum qualifications for recruitment to the post of Lecturers be as follows :-

Essential:

Consistently good academic record with first or high second class (B+) Master's degree in a relevant subject or an equivalent degree of a foreign university.

Desirable: (in order of preference)

i) A doctor's degree or published work of an equally high standard.

ii) Teaching experience of degree/postgraduate classes.

Provided that if a teacher appointed as a Lecturer, is not a Ph.D., at the time of appointment, it would be obligatory that he finishes his Ph.D. within five years of his appointment or gives evidence of equivalent research work. Further, if he does not fulfil the above requirements within a period of five years of his appointment, his increment will be stopped till such time as he fulfils these requirements.

The above decisions had been communicated to all the Central Universities.

6. The question of payment of remuneration to teachers for invigilation work/examination work of private candidates was also considered by the Commission at its meeting held in December, 1975 and the decision taken in this respect is indicated below :-

" The Commission agreed that remuneration may be paid to the examiners who are invited to evaluate the scripts of the students appearing privately and through correspondence courses provided that in the case of correspondence courses the payment would be made for only such additional number of scripts evaluated beyond the minimum number fixed for evaluation of such scripts of regular students by teachers."

The decision of the Commission has been conveyed to the Ministry of Education & Social Welfare. The Ministry of Education have accepted this and the same is being communicated to the Central Universities. The Ministry of Education have, however, raised some points, which are being examined and will be brought up before the Commission.

* Explanation

Consistently good record would mean overall record of all assessments throughout the academic career leading to the Master's degree, which should at least be B+ or high second class.

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7. The recommendations made by the Sen Committee on Teachers inter-alia included recommendation relating to Code of Conduct for teachers. An extract from the report is reproduced below:-

Code of Conduct.

While making these recommendations, we have assumed that the teachers in general will not misuse their responsibilities and privileges. We venture to suggest that the following lapses would constitute improper conduct on the part of a University/College teacher:-

i) Failure to perform his academic duties such as preparation/lectures, demonstrations, assessment, guidance, invigilation, etc.

ii) Gross partiality in assessment of students, deliberately over-marking/under-marking or attempts at victimization of any grounds.

iii) Inciting students against other students, colleges, or administration (This does not interfere with the right of a teacher to express his difference on principles in seminars or other places where students are present.)

iv) Raising questions of caste, creed, religion race or sex in his relationships with his colleagues and trying to use the above considerations for improvement or his prospects.

v) Refusal to carry out the decisions by appropriate administrative and academic bodies and/or functionaries of the university. This will not inhibit his right to express his differences with their policies or decision.

The Commission has, accordingly requested the universities to formulate the Code of Conduct for its teachers in the light of the recommendations of the 'Sen Committee' as indicated above, and also in the light of the recommendations of the National Integeration Committee that the service regulations of teachers in Government and Government aided Schools and Colleges should be modified and provision made to facilitate removal from service of teachers who may be found guilty of communal activities. The Commission has so far received a copy of the Code of Conduct as finalised from the following universities:-

1. University of Baroda. (as prescribed by the State Government of Gujarat) for all universities in the State).

2. University of Rajasthan

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3. Haryana Agricultural University.

4. Dibrugarh University (Subject to review by the executive council)

5. L.N. Mithila University. (Subject to the assent of the Chancellor).

6. Delhi University

7. Orissa University of Agriculture and Technology.

The remaining universities have also been reminded to expedite the finalisation of the Code of Conduct for its teachers.

The Commission has also received copies of the letters issued by the Governments of Panjab, West Bengal, Maharashtra and Uttar Pradesh regarding implementation of the revised scale of pay for its teachers which inter-alia include the provision of 'Code of Conduct' for its teachers. An extract from the letters received from the State Governments in this respect is reproduced below :-

1. Government of Punjab.

> Each university shall draw up a Code of Conduct for its teachers keeping in view the recommendations made by the 'Sen Committee' in this regard. (Such a Code of Conduct shall be submitted to the Government for prior approval within six months of the date of this order).

2. Government of West Bengal.

> "Every teacher shll abide by a Code of Conduct or, if there is no Code of Conduct at present, by such Code of Conduct as may be drawn up in future".

3. Government of Maharashtra.

> "The Universities should draw up a Code of Conduct for its teachers and those in affiliated colleges, keeping in view the various terms and conditions attached to revised scales and also initiate action to frame Statutes under Section 42 of the respective University Act, 1974." Teachers in Government colleges, will however, be governed by the relevant rules framed by Government."

4. Government of Uttar Pradesh.

> "Each university shall draw up a Code of Conduct for its teachers keeping in view the recommendations made by the

Contd...5/-

'Sen Committee' in this regard."

5. Government of Gujarat

The allotment of the revised scale is subject to the acceptance of the Code of Conduct by the teacher, as prescribed by the State Government which is at Annexure 'C' (Appendix V to the note)

6. Government of Haryana.

"Each University shall draw up a Code of Conduct for its teachers keeping in view the recommendations made by the Sen Committee in this regard".

The conditions included as part of revision of scales of pay, by the above mentioned State Governments, which are at variance with the conditions for revision of scales of pay issued by the Government of India.

Extracts from the letter received from the State Government in this connection are enclosed. (Appendix V).

In this connection, the following points are also submitted for the consideration of the Commission:-

(a) While prescribing the minimum qualifications for Lecturers in the Faculties of Arts and Social Sciences, it has been envisaged that one of the minimum qualifications would be a Doctor's degree or published work of an equally high standard. It may be seen whether adequate safeguards have been provided in the minimum qualifications to ensure /that the research work is given the emphasis which the Commission desires.

There are several disciplines/subjects, particularly foreign languages where persons with such qualifications may not be available and where facilities may also be not forthcoming to enable persons to obtain a doctor's degree within five years of appointment as a Lecturer.

(b) Some guidelines may also have to be suggested to enable the universities to judge the published work which may be recognised as equivalent to a doctor's degree.

(c) Minimum qualifications may also be prescribed for recruitment to the posts of Lecturers in other faculties (Commission has already decided that for recruitment to the faculty of Law, the minimum qualifications be an LL.M. degree.)

p.t.o.6/-

(d) The age of retirement of teachers has been prescribed as 60 years. Some universities have made a provision of re-employment of teachers after the age of retirement. It is felt that such incumbents should not be appointed as Head of a Department or a Dean of a Faculty or hold any other such post.

(e) The Government of India may be requested to impress upon the State Governments to introduce retirement benefits (where not already done) as recommended by the Sen Committee and also provision for security of service for the employees of the universities and colleges.

(f) The universities be requested to send a copy of the advertisement issued for recruitment to the academic posts and also the qualifications of the persons finally appointed. (It may be mentioned that the Universities have been advised to also send advertisements for recruitment to the Employment News (Rozgar Samachar) being published by the D.A.V.P.).

The Government of Meghalaya has suggested that a marginally lower level of academic performance should be allowed for a person belonging to scheduled tribe for him to be eligible for appointment as a lecturer. It has been suggested a relaxation by 5% marks in the minimum qualifications of 55% marks at Master's degree level to such candidates.

The matter is placed before the Commission for consideration.

AS(CP/Addl. Secy.

SLK

Appendix 1(i) to item No.27

Statement indicating the existing/revised scales of pay in respect of Central Universities/Delhi Colleges

Post	Existing Pay Scale Rs.	Revised Pay Scale Rs.
Lecturer	400-900	700-40-1100-50-1600
Reader	700-1250	1200-50-1300-60-1900
Professor	1100-1600	1500-60-1800-100-2000-125/2-2500
Professor (Senior Grade)	1600-1800	
Professor of Eminence	-	3000 (fixed)

As regards Colleges of Delhi University (either maintained by the University or receiving maintenance grants from the Commission) the revised pay scales may be as follows:-

Post	Existing Pay Scale Rs.	Revised Pay Scale Rs.
Lecturer	400-950	700-40-1100-50-1600
Lecturer (Selection Grade)	700-1250	
Principal	1100-1600	1500-60-1800-100-2000-125/2-2500

Consequent on the revision of pay scales, there will be no Selection Grade' for lecturers in these colleges. Separate orders will issue with regard to fixation of salary of the existing lecturers in the Selection Grade in the revised scale of Rs. 700-1600.

Appendix 1(ii) to
Item No.27

STATEMENT SHOWING PAY SCALES FOR VARIOUS CATEGORIES OF TEACHERS IN UNIVERSITIES AND COLLEGES

	Post	Existing Pay Scale (1966-71)		Revised Pay Scales
				A - UNIVERSITIES
(i)	Lecturer	Rs.400-950		Rs.700-40-1100-50-1600
(ii)	Reader	Rs.700-1250		Rs.1200-50-1300-60-1900
(iii)	Professor	Rs.1100-1600	)	Rs.1500-60-1800-100-2000-125/2-2500
(iv)	Professor (Senior Grade)	Rs.1600-1800	)	
(v)	Professor of Eminence	-		Rs.3000 (fixed)
				B - POSTGRADUATE COLLEGES
(i)	Demonstrator/Tutor	Rs.250-400		Rs.500-20-700-25-900 (for existing incumbents)
(ii)	Lecturer (Jr.scale)	Rs.300-600	)	
(iii)	Lecturer (Sr.scale)	Rs.400-800	)	Rs.700-40-1100-50-1300-Assessment-50-1600
(iv)	Sr. Lecturer/Reader	Rs.700-1100	)	
(v)	Principal	Rs.800-1250/ Rs.1000-1500		(i) Rs.1200-50-1300-60-1900 (ii) Rs.1500-60-1800-100-2000-125/2-2500
				C - UNDERGRADUATE COLLEGES
(i)	Demonstrator/Tutor	Rs.250-400		Rs.500-20-700-25-900 (for existing incumbents only)
(ii)	Lecturer(Jr.Scale)	Rs.300-600	)	Rs.700-40-1100-50-1300-Assessment-50-1600
(iii)	Lecturer(Sr.Scale)	Rs.400-800	)	
(iv)	Principal	Rs.700-1100		(i) Rs.1200-50-1300-60-1900 (ii) Rs.1500-60-1800-100-2000-125/2-2500

Appendix II

CONDITION FOR INTRODUCTION OF THE REVISED PAY SCALES

(i) The scheme of revised pay scales shall cover teachers in Universities and Colleges (including Government Colleges) admitted to their privileges, except those of Medical, Agricultural and Veterinary Science Colleges. In the case of Engineering Colleges a separate circular will follow:-

(ii) The revised pay scales are inclusive of Dearness Allowance, Dearness Pay and interim Relief that were admissible to the teachers according to the approved rates as on December 31, 1972. No Central assistances will be available for the allowances sanctioned that may be sanctioned, on and after January 1, 1973.

(iii) Central assistance will be provided in respect of only those posts which were in existence on January 1, 1973. All posts created after that date will have to be provided in the revised pay scales but these will not be eligible for Central assistance.

(iv) Recruitment to all categories of teacher-lecturers, Readers and Professors in Universities shall be made strictly on merit and on the basis of all-India advertisementand selection. The qualifications prescribed for the posts should essentially be related to the academic attainments in the subject concerned and should not be linked with language or other regional considerations. Appointments should not be made on communal or caste considerations. The Selection Committee should have outside experts and their constitution should be prescribed by the statutes of the concerned University.

(v) For future recruitment to the posts of Lecturers in Universities as well as in Colleges, the minimum qualifications shall be as may be determined by the University Grants Commission from time to time.

(vi) The existing lecturers in Colleges who did not possess at the time of their initial recruitment minimum qualifications as prescribed by the University concerned should be required to attin these qualifications within five years from the date of placement in the revised scale. If theya re unable to do so during this period, they shall not be allowed to earn any future increment till they have satisfied this condition.

(vii) All appointments of teachers in colleges shall be made on merit and on the basis of all-India advertisement. The constitution of a Selection Committee for recruitment to the posts of lecturers in a college should be as follows:-

(a) Chairman, Governing Body of the College or his nominee;

(b) A nominee of the Vice-Chancellor;

p.t.o.

(c) Two experts to be nominated by the Chairman out of the panel of experts approved by the University;

(d) Principal of the college; and

(e) Head of the Department concerned of the College.

No selection shall be considered valid unless at least one expert is present. The recommendations of the Selection Committee shall be subject to the approval of the Vice-Chancellor.

(viii) All appointments of Principals of Colleges shall be made by a Selection Committee composed of the following:-

(a) Chairman, Governing Body of the College;

(b) One member of the Governing Body;

(c) Two nominees of the Vice-Chancellor;

(d) One person to be appointed by the Chairman of the Governing Body out of a panel of 10 persons prepared by the Director of Higher Education/Education of the State Government.

The recommendations of the Selection Committee shall be subject to the approval of the Vice-Chancellor.

(ix) The period of probation of a teacher shall in no case be more than 24 months. The Executive Council/Governing Body of the College may, for reasons to be recorded waive the condition of probation. The Executive Council/Governing Body shall have the right to assess the suitability of a teacher for confirmation even before the expiry of the period of 24 months from the date of his/her appointment but not earlier than 9 months from that date. A suitable provision may be made in the Ordinances/Statutes prescribing a schedule for placing cases regarding confirmation before the appropriate authorities well in time before the date of expiry of the probation period.

(x) The age of superannuation for teachers as well as for Principals shall be 60 years and thereafter no further extension in service shall be given. A teacher who has already been given extension on attaining the age of 60 years on January 1, 1973 or thereafter shall continue to be in the old scale of pay during the period of extension and shall not be permitted to opt for the revised scale.

(xi) No teacher/Principal shall be paid any remuneration for examination work, including invigilation work, within the University/ Institution.

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(xii) The work load of teachers, submission of plan of work, etc., shall be as may be determined by the University Grants Commission from time to time.

(xiii) The existing postgraduate teachers in the colleges, who are designated as Senior Lecturers/Readers, in the scale of Rs. 700-1100 shall be placed in the revised scale of Rs. 700-1600. Separate orders will issue with regard to fixation of salary of these teachers.

(xiv) The assessment at Rs. 1300 in the scale of Rs. 700-40-1100-50-1300 Assessment-50-1600, prescribed for college lecturers, shall be done by a Committee to be appointed by the University.

(xv) The concerned University/State Government may decide as to which of the two scales of pay, viz. Rs. 1200-1900 and Rs. 1500-2500 for Principals should be given to a particular college, keeping in view the nature and magnitude of the work and problems in the college.

(xvi) The revised scale of Rs. 500-900 is for the existing Demonstrators/ Tutors only. In future, Demonstrators/Tutors shall not be appointed in Universities and Colleges.

(xvii) The fixation of pay in the revised scales of pay shall be according to the formula recommended by the Third Central Pay Commission and accepted by the Government of India with modifications for Class I Officer, if any (Enclosure). Where the pay fixation formula cannot cover cases without giving rise to some anamolies; such cases could be referred to the Government of India for consideration.

(xviii) The additional expenditure involved in implementing the scheme shall be treated as a Non-Plan item of expenditure.

(xiv) Each University shall draw up a code of conduct for its teachers keeping in view the recommendations made by the Sen Committee in this regard.

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Appendix III to Item No 27.

REVISION OF SCALES OF PAY OF UNIVERSITY AND COLLEGE TEACHERS IMPLEMENTATION REGARDING

The following scales of pay have been recommended by the Government of India for introduction in the universities and colleges:-

Universities		Rs.
(i) Lecturer		700-40-1100-50-1600
(ii) Reader		1200-50-1300-60-1900
(iii) Professor		1500-60-1800-100-2000-125/2-2500
Colleges-Postgraduate/Undergraduate:		
(i) Demonstrator/Tutor		500-20-700-25-900 (for existing incumbents only)
(ii) Lecturer		700-40-1100-50-1300-Assessment-50-1600.
(iii) Principal	(i)	1200-50-1300-60-1900
	(ii)	1500-60-1800-100-2000-125/2-2500.

2. The State Governments have also been given the option to decide in their discretion to introduce lower scales of pay than those recommended by the Government of India and adopted by the Central Universities, from 1.1.1973 or a later date.

3. While some States have issued orders for implementing for revised scales of pay as recommended by the Government of India or lower scales of pay, others have proposed to introduce lower scales of pay. Some States have only accepted the scheme in principle but orders are yet to issue. The position in respect of various States is as follows:-

1. Andhra Pradesh

The Government of Andhra Pradesh have issued orders for introducing the following revised scales of pay with effect from 1.1.1974 in respect of teachers in Government and Aided Colleges, Oriental Colleges and Government College of Physical Education:-

	Rs.
1. Principal (Postgraduate) Government Training College, Rajahmundry.	1100-50-1650

....2/-

2.	Principals of other Degree Colleges, Oriental Colleges and Government College of Physical Education.	900-50-1450
3.	Heads of Departments/Lecturers (Senior)/Lecturers(Gazetted) in College of Phy. Education.	700-30-1000-40-1200
4.	Assistant Lecturers/Lecturers (Junior)	530-30-770-35-1050
5.	Tutors/Demonstrators	430-20-650-25-900

The order was issued without consultation with us and it is now under examination.

2. Assam

The matter is under consideration of the State Government.

3. Bihar.

The Government of Bihar have accepted in principle the Scheme of the revised U.G.C. scales of pay of university and college teachers. Formal orders have not yet been issued. The State Government had recently informed that they will forward their proposals to the Government of India shortly.

4. Gujarat

The State Government have decided to implement the scheme more or less as recommended by the Central Government The orders are likely to issue very shortly.

5. Haryana

The State Government have issued orders implementing the scheme more or less as recommended by the Central Government.

6. Himachal Pradesh

The Government of Himachal Pradesh have informed that the Himachal Pradesh Government will follow the Punjab practice. The Punjab Government have accepted these scales w.e.f. 1.4.1975. The Punjab Government have not worked out pay fixation formula as yet and final decision of H.P. Government will be communicated on receipt of pay fixation formula from Punjab.

7. Jammu and Kashmir.

The Government of Jammu and Kashmir had revised the scales of pay of college teachers w.e.f. 1.7.1972, along

with the general revision of pay scales of other Government employees on the recommendations of the State Pay Commission. The revised scales are given below:-

(1) Principal	(i)	1100-50-1300-75-1600
	(ii)	1000-50-1500
(2) Professor) Cordinator) Lecturer)		475-25-600-EB-30-720-40-800-EB-50-1250. (Running Grade)

While communicating the approval of the Ministry to the proposal of the State Government, the State Government was requested to clarify whether the revised scales are the scales adopted w.e.f. 1.7.1972 or whether these scales were declared before the Central Government announced the scheme of revision of pay scales and were proposed to be given effect to retrospectively from 1.7.1972. In the later case, there would be no justification for the Central Government to give any assistance for the revision of pay scales of college teachers. In case the revision was made subsequent to the announcement by the Central Government regarding the revision of scales of pay, Central assistance would be available only from 1.1.1973. They were also advised to consider an upward revision of the scales proposed and to adopt the formula for fixation of pay on the lines recommended by this Ministry.

They also propose to adopt the following scales of pay for university teachers after taking into consideration the various administrative and financial aspects of the cases w.e.f. 1.7.1972:

Professor	Rs.1400-2000
Reader	Rs. 1100-1600
Lecturer	Rs. 700-1300

8. Kerala

The Government of Kerala have introduced the following scales of pay for universities and college teachers w.e.f. 1.7.1973:

Universities:	Rs.
Lecturer	600-40-800-50-1100-50/2-1250
Reader	850-50-1350-50/2-1450
Professor (1/3 of total no. of professors to be placed in the scales of Rs.1600-1800).	1200-50-1650-50/2-1750

Colleges:	
Demonstrator/Tutor	345-13-358-14-400-15-505-15/2-580
Lecturers	510-25-635-30-695-35-835-40-875-40/2-995

Professor (Grade II)	710-40-750-50-1050-50/2-1200
Professor (Grade I)	850-50-1350-50/2-1450
Principal	
(i) Under Graduate (ii) Post Graduate Colleges	(i) and (ii) 1050-50-1450-50/2-1550

As the State Government expressed their inability to accept some of the conditions attached to the scheme viz. minimum qualifications for recruitment for the post of lectur payment of remuneration for examination work, reservation of posts for specific categories etc. The State Government was requested to consider accepting the above conditions. Accor to the reply received from the State Government recently, the are not agreeable to modify their proposals. The view of the Central Government is that the scheme implemented by the State Government is not in accordance with the one recommende by the Central Government.

9. Karnataka

The Government of Karnataka have informed that the matter is under their examination.

10. Madhya Pradesh

The Government of Madhya Pradesh propose to adopt the following scales of pay for University and College teachers i the State with effect from 1.1.1973:-

University Teachers	Rs.
Lecturers	620-40-900-50-1400
Readers	1100-50-1600
Professors.	1300-50-1500-75-1800-100-200
Professors of Eminence (in accordance with the rules and conditions to be laid down by UGC)	
College Teachers	
Lecturers (which includes the present Assistant Professors).	620-40-900-50-1050-EB-50-13
Professors	1100-50-1500
Principals of Degree Colleges.	1100-50-1600
Principals of Postgraduate Colleges.	1300-50-1500-75-1800-100-20

The State Government propose to apply higher qualifications prescribed for future recruitment to the existing teache also. They have been requested to reconsider this. They were also requested to prescribe certain other conditions

as stipulated by the Ministry for implementation of the scheme. All these issues are now proposed to be discussed with the State Education Secretary.

11. Maharashtra

The Government of Maharashtra have issued orders to introduce the revised scales of pay w.e.f. 1.1.1973. They have, however, now informed that the Federation of the University Teachers' Organisations, claiming to be the sole representative of the University/College teachers in the State has, however, filed a Writ petition in the High Court of Bombay alleging therein that the Government is not competent to lay down any conditions viz. qualifications, work-load, vacation, assessment, remuneration for examinership, etc. The Resolution of the Government is bad in law in view of incompetence of Government and as such it should be quashed.

The High Court admitted the application on 15th November, 1975 without hearing the Government side and issued an ad-interim injuction to the implementation of paragraphs 6,7,8,11,12 and 13 of the Government Resolution. The interim relief was to be heard on 28th November, 1975. The same had been postponed to 11th December, 1975. It was postponed to 7th January, 1976. Further information is awaited from the State Government.

The contention of the teacher community is that the Sen Committee did not make any recommendation in respect of the work-load and non-payment for examination work. They are also conteding that Government has no right to direct the University to lay down any conditions under University Acts of 1974. As a result, most of the University and college teachers have not exercised their option in favour of new scales, as required under Government orders. Government is, therefore, considering what further steps should be taken in this regard.

12. Manipur

The Government of Manipur have issued order implementing w.e.f. 1.1.1973, the revised scales of pay of university and college teachers on the lines recommended by the Government of India.

13. Meghalaya

The tentative proposals worked out by the State Government were discussed with the representatives of the State Government on December 1, 1975. Final proposals of the State Government are awaited.

14. Nagaland

The Government of Nagaland have not intimated their decision in the matter.

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15. Orissa

The Government of Orissa have submitted their proposals for introduction of the revised scales of pay in their universities only. The proposal is under examination.

16. Punjab

The Government of Punjab have issued orders implementing w.e.f. 1.4.1975, the revised scales of pay of university and college teachers on the lines recommended by the Government of India. (It is understood from the press reports that the State Govt has decided to introduce the revised scales w.e.f. 1.1.

17. Rajasthan

The Government of Rajasthan have accepted the scheme of revision of scales of pay in principle. A Committee has been appointed by the Chief Minister of Rajasthan with Education Secretary, Finance Secretary and Director of Public Instruction etc. to work out the details regarding implementation of the revised scales of pay.

18. Tamil Nadu

The Government of Tamil Nadu have recently informed that the matter is under their consideration and the final decision has not yet been taken.

19. Tripura

The Government of Tripura have accepted the recommendations of the U.G.C. regarding revision of scales of pay of Universit and College teachers, in principle. The State Government have recently informed that final decision on the issue will be taken after studying the financial implications vis-a-vis their financial resources.

20. Uttar Pradesh.

The Government of Uttar Pradesh have revised the scales of pay w.e.f. 1..1.1973 in respect of teachers in universities and non-Government colleges (except colleges affiliated to Sampurnanand Sanskrit Vishwavidyalaya, Varanasi) on the lines recommended by the Government of India..

21. West Bengal.

The Government of West Bengal have issued orders implementing the revised scales of pay w.e.f. 1.1.1973 in respect of teachers in universities and non-Government colleges including Government sponsored colleges.

Appendix IV to Item No. 27

Extract from the letter addressed to the Secretary to the State Govt. of India Education deaprtment by the Government of India, Ministry of Education and Social Welfare regarding the qualification prescribed for recruitment to the post of Lecturers.

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xxx xxx xxx

2. The University Grants Commission has now decided that the following qualifications may be prescribed for recruitment to the posts of Lecturers in the Faculties of Arts and Social Sciences, including Commerce and Science in universities and colleges:

> For future recruitment to the posts of lecturers in Universities as well as in Colleges, the minimum qualifications shall be as may be determined by the University Grants Commission which are as follows:-

University Lecturers

(a) A Doctor's degree or published work of an equally high standard; and

(b) consistently good academic record with 1st or high 2nd class (B+) Master's degree in a relevant subject or an equivalent degree of a foreign university.

Having regard to the need for developing inter-disciplinary programmes, the degrees in (a) and (b) above may be in relevant subjects.

Provided that if the Selection Committee is of the view that the research work of a candidate as evident either from his thesis or from his published work is of very high standard, it may relax any of qualifications prescribed in (b) above.

Provided further that if a candidate possessing a Doctor's degree or equivalent published work is not available or is not considered suitable, a person possessing a consistently good academic record, (due weightage being given to M.Phil. or equivalent degree or research work of quality) may be appointed on the condition that he will have to obtain a Doctor's degree or give evidence of published work of equivalent h standard within five years of his appointment, failing which he will not be able to earn future increments until he fulfils these requirements.

Explanation:

Consistently good academic record mean overall record of all assessments through out the academic career leading to the Master's degree which should be at least B+ or high second class.

p.t.o.

College Lecturers:

(a) A consistently good academic record with 1st or high 2nd class (B+) at the Master's degree in a relevant subject or an equivalent degree of a foreign university; and

(b) an M.Phil. degree or a recognised degree beyond the Master's level or published work indicating the capacity of a candidate for independent research work.

Provided that if a candidate possessing the qualification as at (b) above is not available or not considered suitable, the college, on the recommendation of the Selection Committee, may appoint a person possessing a consistently good academic record on the condition that he will have to obtain an M.Phil degree or a recognised degree beyond the Master's level within five years of his appointment, failing which he will not be able to earn future increments till he obtains that degree or gives evidence of equivalent published work of high standard.

Explanation.

Consistently good record would mean overall record of all assessments throughout the academic career leading to the Master's degree, which should be at least B+ or high second class.

I - Government of Maharashtra

Ministry of Education & Social Welfare recommendations for revised Scales of Pay of Teachers in Universities and Colleges.	Orders of the State Government of Maharashtra	Remarks
1	2 & 3	
Date of Increment.		
Date of next increment in the revised scale : The next increment of teacher whose pay has been fixed in the revised scale in accordance with rule-I shall be granted on the date he would have drawn his increment, had he continued in the existing scale. Provided that in cases where the pay of a teacher is stepped up in terms of Note 3 to rule I, the next increment shall be granted on the completion of qualifying service of twelve months from the date of the stepping up of the pay in the revised scale. Provided further that, in cases other than those covered by the preceding proviso, the next increment of a teacher whose pay is fixed on the 1st day of January, 1973 at the same stage as the one fixed for another junior to him in the same cadre and drawing apy at a lower stage than his in the existing scale, shall be granted on the same date as admissible to his junior, if the date of increment of the junior happens to be earlier.	The date of increment in the revised scales of pay should be determined on the following principles:- (i) Where the initial pay in the University Grants Commission Scales provides for increase in the basic pay by an amount equal to or higher than the rate of increment in the existing scale, the next increment should accrue after completion of full incremental period from the date the teacher elects to come over to the University Grants Commission scale. (ii) Where the increase is not provided to the extent indicated in (i) above, the next increment of the teacher should accrue on completion of full incremental period or on the date of his normal increment in the existing scale, which ever is earlier.	
Terms and Conditions attached to the Revised Scales of pay No provision for any agreement with the Management for accepting the revised scales.	The Teachers opting for the Revised Scales will have to enter into an agreement with the Management about their acceptance of the conditions precedent to their availing themselves of the revised scale.	

1	2	3
Work Load		
The work load for Teachers as may be prescribed/determined by the Commission for time to time.		Teachers in a University/College will have a work-load of not less than 40 clock hours in a week. Out of these 40 hours, a minimum of 20 clock hours will have to be spent by a teachers on the official premises of the institution for class-room work like teaching, guidance and tutorials or consultation. However, the actual number of hours to be determined by the University. The remaining hours should be devoted to research preparation for teaching, correction and examination work including invigilation, extra-curricular activities, administration and professional work.
Vacations		
-- No recommendations --		"Vacation" does not mean that a Teacher is automatically on holiday or otherwise ceases to work for the University/College, even if required to do so, and every teacher shall be expected to undertake such work, even when the University/College is not functioning, as may be assigned to him by the competent authority relevant to his duties as a teacher, whether of a curricular co-curricular, extra-curricular or extra-mural nature, including applied or field work relative to his subject, or work of the nature of social service, inside or outside the area of the University/College;

1	2	3
Remuneration for Examinership		
No teacher/Principal shall be paid any remuneration for examination work, including invigilation work, within the University/Institution.	The revised pay-scales are inclusive of an element on account of remuneration for examination work. Consequently, the University/College teachers getting the revised scale will not be entitled to any remuneration for examination work in any University/College within the State. Failure to do examination work allotted, will be taken to mean dereliction of duty and apart from any action which the University may take, the teachers will make themselves liable to being denied the benefit of the revised scales.	
Assessment of Work.		
The assessment at Rs. 1300/- in the scale of Rs. 700-40-1100-50-1300-Assessment -50-1600, prescribed for college lecturers, shall be done by a Committee to be appointed by the University.	A lecturer in a college will be allowed to draw increment after the stage of Rs. 1300/- only after his work has been assessed and found satisfactory, in a manner to be decided by the University. In addition, there will be an assessment of the work of every University and college teacher, every three years in a manner to be prescribed by the University and record maintained in the University and college offices.	

1	2	3
Appointment of Principals.		
All appointments of Principals of Colleges shall be made by a Selection Committee composed of the following:- (a) Chairman, Governing Body of the college; (b) One member of the Governing Body; (c) Two nominees of the Vice-Chancellor; (d) One person to be appointed by the Chairman of the Governing Body out of panel of 10 persons prepared by the Director of Higher Education/ Education of the State Government. The recommendations of the Selection Committee shall be subject to the approval of the Vice-Chancellor.	Same as by the Ministry of Education under the preceding column except for the following variations:- (a) Director of Public Instruction or his representative (b) This condition shall not apply to recruitment of posts to Government Colleges.	

1	2
Period of Probation.	
The period of probation of a teacher shall in no case be more that 24 months. The Executive Council/Governing Body of the College may, for reasons to be recorded waive the condition of probation. The Executive Council/Governing Body shall have the right to assess the suitability of a teacher for confirmation even before the expiry of the period of 24 months from the date of his/her appointment but not earlier than 9 months from that date. A suitable provision may be made in the Ordinances/ Statutes prescribing a schedule for placing cases regarding confirmation before the appropriate authorities will in time before the date of expiry of the probation period.	Same as by the Ministry of Education under the preceding column except that this will not apply to Government Colleges.

1	2	3
Age of superannuation		
The age of superannuation for teachers as well as for Principals shall be 60 years and thereafter no further extension in service shall be given. A teacher who has already been given extension on attaining the age of 60 years on January 1, 1973 or thereafter shall continue to be in the old scale of pay during the period of extension and shall not be permitted to opt for the revised scale.	The age of superannuation for teachers as well as for Principals shall be governed by rules relating to service conditions under the State Government. Whereever in Non-Government Colleges or Universities the age of superannuation is 60 or less, the lesser limit shall prevail. However, no further extension in service shall be given. A teacher who has been given extension on attaining the age of superannuation on January 1, 1973, or thereafter shall continue to be in the old scale of pay during the period of extension and shall not be permitted to opt for the revised scale.	

III West Bengal

Ministry of Education & Social Welfare recommendations for revised scales of Pay of Teachers in Universities and Colleges.	Recommendations of the State Government of West Bengal	Remarks
Principal's Scales of Pay.		
The concerned Universities/State Government may decide as to which of the two scales of pay, viz. Rs. 1200-1900 and Rs. 1500-2500 for Principals should be given to a particular college, keeping in view the nature and magnitude of the work and problems in the college.	Only those Principals will be eligible for the higher scale of pay, viz. Rs. 1500-60-1800-100-2000-125/2-2500 who on 1.1.73 completed at least 7 years of service as Principal, in Colleges which had an aggregate roll strength in the main shift of not less than 750 in each of the three sessions 1972-73, 1973-74 and 1974-75.	

V Gujarat

Ministry of Education recommendations for revised scales of pay of Teachers in Universities and College.	Recommendations of the State of Gujarat	Remarks
1.	2.	3.
Age of Superannuation.		
The age of superannuation for teachers as well as for Principals shall be 60 years and thereafter no further extension in service shall be given. A teacher who has already been given extension on attaining the age of 60 years on January 1, 1973 or thereafter shall continue to be in the old scale of pay during the period of extension and shall not be permitted to opt for the revised scale	For the persons who are recruited henceforth, age of retirements for the purpose of grant-in-aid shall be 58 years. The University/Colleges shall not be entitled to receive any grant from the Government in case of such persons continued beyond the age of 58 years. A teacher who has already been given extension on attaining the age of 60 years on January 1,1973 or thereafter, shall continue to be in the old scale of pay during the period of extension and shall not be eligble for the revised scale of pay. In exceptional cases, a Professor can be reemployed at the age of 58 years for a total period not exceeding three years in accordance with rules regarding re-employment as obtaining in Government and with the previous approval of the Chancellor. During the such period of re-employment, no post of administration shall be held by him.	
Remuneration for Teachers		
No teacher/Principal shall be paid any remuneration for examination work, including invigilation work, within the University/Institution.	No teacher or Principal shall be paid any remuneration for examination work including invigilation work any of the University/College in the State. Additional remuneration shall not be paid for P.G. work.	

1.	2	3.
Work Load of Teachers.		
The work load of teachers, submission of plan of work, etc., shall be as may be determined by the University Grants Commission from time to time.	The work load of all University and College teachers shall be the same and not less than 40 hours a week, which will include preparation for teaching, actual class work (including invigilation research tutorials and guidance to students, extra curricular activities administration and profession work). The university shall lay down the guidelines for the quantum of work and in case the work is not available under any of these heads additional work to that extent shall be given to the teacher under some other head where work is available so that the total quantum of work turned out by a teacher remains the same in the case of all teachers. While some of this work may be done at home, every teacher is required to be present in the Deptt. for a specific time every working day. The Universities shall lay down the guidelines for the work to be done at home and in the college/University. In the assignment of work to a teacher, it may be ensured that be is able to enjoy in the course of one year not more than eight weeks vacation.	
Assessment of Teachers.		
The assessment at Rs.1300 in the scale of Rs.700-40-1100-50-1300-Assessment-50-1600, prescribed for college lecturers, shall be done by a Committee to be appointed by the University.	In addition to the assessment shown in the respective pay-scales there will be an assessment of the work of every University and college teacher once in three years in a manner to be prescribed by the University and the record of such assessment shall be maintained in the University/College.	

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VI Haryana

Ministry of Education recommendations for revised scales of pay of Teachers in Universities and Colleges.	Recommendations of the State of Haryana	Remarks
1.	2.	3.
Revised scales of pay of DPEs. Decision of the Ministry of Education and Social Welfare, Government of India is still awaited.	State Government has revised the scale as under:- Category: Joint D.P.I. Existing Scale: Rs. 1600-2000 Revised Scale: Rs. 1200-50-1300-60-1540-EB-60-1900	
Age of superannuation. The age of superannuation for teachers as well as for Principals shall be 60 years and thereafter no further extension in service shall be given. A teacher who has already been given extension on attaining the age of 60 years on January 1,1973 or thereafter shall continue to be in the old scale of pay during the period of extension and shall not be permitted to opt for the revised scale.	The age of superannuation for the teaching personnel of the Government colleges shall be 58 years.	

II Government of Panjab

Ministry of Education & Social Welfare recommendations for revised scales of pay of Teachers in Universities and Colleges.	Recommendations of the State Government of Panjab	Remarks
1	2	3
Appointment of Teachers		
All appointments of teachers in colleges shall be made on merit and on the basis of all-India advertisement. The constitution of a Selection Committee for recruitment to the posts of lecturers in a college should be as follows:- (a) Chairman, Governing Body of the College or his nominee; (b) A nominee of the Vice-Chancellor; (c) Two experts to be nominated by the Chairman out of the panel of experts approved by the University; (d) Principal of the college; and (e) Head of the Department concerned of the College. No selection shall be considered valid unless at least one expert is present The recommendations of the Selection Committee shall be subject to the approval of the Vice-Chancellor.	' Same as by the Ministry of Education under the preceeding column except for the following variation." (a) A representative of the Director of Public Instruction, Panjab (b) This shall not apply to recruitment of posts to Government Colleges.	

CONFIDENTIAL

UNIVERSITY GRANTS COMMISSION

Meeting:
Dated : April 29, 1976

Item No.28: To consider the budget estimates of the University Grants Commission for 1976-77 (Plan)

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The Commission at its meeting held on March 22,1976 while noting the provision that may be available to the Commission under Plan during 1976-77 desired that the draft budget estimates may be referred to a Committee of the Commission for consideration (Item No.33). In pursuance of this, the draft budget estimates were considered by a Committee constituted for the purpose in its meeting held on April 21, 1976. The meeting was attended by the following:

1. Prof. Satish Chandra
2. Shri K.N. Channa
3. Dr. Ajit Mazoomdar
4. Prof. R.P. Bambah
5. Prof. S.S. Saluja
6. Prof.(Miss) A.J. Dastur

A copy of the budget estimates as accepted by the Committee within an overall ceiling of Rs.3983.85 lakhs is enclosed (Appendix - I).

A statement indicating the V Plan outlay and the expenditure incurred during 1975-76 and the provision suggested for 1976-77 under different schemes is also attached (Appendix-II).

The budget estimates for 1976-77 (Plan) are for consideration of the Commission.

The Committee felt that the provision of Rs.616.10 lakhs which is inclusive of the amount of Rs.100 lakhs (to be provided by the Department of Coal for the Indian School of Mines, Dhanbad) for development of engineering and technology was inadequate and that the Government of India be approached for increasing this allocation.

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SUMMARY

Appendix- I

Budget Estimates 1976-77 - PLAN

(RUPEES IN LAKHS)

		Budget Estimates 1975-76	Revised Estimates 1975-76	Actual Expenditure (Provisional) 1975-76	Proposed Budget Estimates 1976-77
A.	Grants to Central and State Universities for Humanities	257.25	298.65	3,04,96,437.79	372.00
B.	Grants to Central and State Universities for Science	683.01	795.75	7,77,58,523.92	735.00
D.	Grants to Constituent/ affiliated Colleges	466.95	424.65	2,77,53,813.64	462.00
E.	Grants to Central and State Universities for Misc.Schemes	*1292.45	*1240.20	10,46,98,259.67	*1767.45
F.	Misc. Expenditure	32.05	30.45	23,97,868.76	31.30
	Total :	-2731.71	2789.70	24,31,04,903.78	3367.75
C.	Grants to Central and State Universities for Engg. & Tech.	401.37	**501.90	4,17,42,525.46	@616.10
	GRAND TOTAL :	-3133.08	3291.60	28,48,47,429.24	-3983.85
*	includes provision for Medical Colleges and Hospitals attached to Central Universities	153.80	153.15	25,17,412.40	133.35

*Rs 50.00 lakhs provided by the Deptt. of Coal

@ Rs 100.00 lakhs to be provided by the Deptt. of Coal.

		Budget Estimates 1975-76	Revised Estimates 1975-76	Actual Expenditure (Provisional) 1975-76	Proposed Budged Estimates for 1976-77
		(1)	(2)	(3)	(4)
			(Rupees in Lakhs)		
A.	GRANTS TO CENTRAL AND STATE UNIVERSITIES FOR HUMANITIES:				
1.	Staff	44.55	50.25	18,94,845/18	55.00
2.	Buildings	37.75	42.05	33,72,753/90	50.00
3.	Equipment (Technical)	7.60	14.35	4,56,572/12	10.00
4.	Books and Journals	49.50	78.10	1,00,80,987/49	70.00
5.	Support for Research				
	a) Centres of Advanced Study	9.00	9.00	13,24,045/49	25.00
	b) Special Assistance to selected departments	4.00	4.00	5,02,728/22	10.00
	c) Area Studies	13.25	14.20	5,49,919/85	20.00
	d) Financial assistance to teachers for research work	4.00	6.00	4,04,138/40	10.00
	e) Project support	6.25	6.25	8,98,361/51	15.00
	f) Departmental/ Institutional support	-	5.00	--	10.00
	g) Research fellowships	80.20	68.05	1,09,94,640/90	95.00
6.	Other schemes	1.15	1.40	17,444/73	2.00
	Total A	257.25	298.65	3,04,96,437/79	372.00

		Budget Estimates 1975-76 (1)	Revised Estimates 1975-76 (2)	Actual Expenditure (Provisional) 1975-76 (3)	Proposed Budget Estimates for 1976-77 (4)
			(Rupees in Lakhs)		
B.	GRANTS TO CENTRAL AND STATE UNIVERSITIES FOR SCIENCE:				
1.	Staff	23.85	35.50	12,89,090/09	75.00
2.	Buildings	70.70	78.35	54,45,006/18	75.00
3.	i) Payment under Dollar Loan for Equipment	-			
	ii) Other equipment	162.15	194.80	2,63,69,419/11	100.00
4.	Books and Journals	50.80	77.00	97,61,821/68	75.00
5.	Support for Research:				
	a) Centres of Advanced Study	76.45	76.45	35,97,491/93	60.00
	b) Special assistance to selected deptts.	70.21	70.00	57,72,307/50	60.00
	c) Financial assistance to teachers for research work	11.50	11.50	10,64,483/-	15.00
	d) Project support	85.00	85.00	80,20,355/98	100.00
	e) Department/ Institutional support	20.00	55.00	7,61,250/-	20.00
	f) Research Fellowships	111.85	108.15	1,49,74,429/31	150.00
6.	Other Schemes	0.50	4.00	7,02,869/14	5.00
	Total B	683.01	795.75	7,77,58,523/92	735.00

		Budget Estimates 1975-76	Revised Estimates 1975-76	Actual Expenditure (Provisional) 1975-76	Proposed Budget Estimates for 1976-77
		(1)	(2)	(3)	(4)
			(Rupees in lakhs)		
C.	GRANTS TO CENTRAL AND STATE UNIVERSITIES FOR ENGINEERING & TECHNOLOGY				
1.	Staff & maintenance	50.00		51,72,934.10	
2.	Construction of buildings	50.00		68,26,600.05	
3.	Purchase of equipment	75.00	266.00	78,31,831.52	384.00
4.	Library books & journals	20.00		11,20,118.88	
5.	Misc. schemes	2.00		52,068.40	
6.	Post-graduate scholarships	75.00		1,07,72,151.85	
7.	Research Fellowships	10.66	8.95	5,15,541.53	5.00
8.	Construction of hostels	2.10	2.10	85,844.00	0.80
9.	Construction of staff quarters	0.05	0.05	5,000.00	0.10
10.	Revision of salary scales	0.50	0.50	--	0.10
11.	Grants to Indian Institute of Science, Bangalore	106.06	149.30	80,89,435.13	100.00
12.	Grants to Indian School of Mines, Dhanbad	10.00	*65.00	12,71,000.00	@116.10
13.	Support for Research	--	10.00	-	10.00
	Total C	401.37	501.90	4,17,42,525.46	616.10

*Rs. 50 lakh provided by the Department of Coal for 1975-76

@ Rs. 100 lakhs to be provided by the Department of Coal 1976-77.

	Budget Estimates 1975-76	Revised Estimates 1975-76	Actual Expenditure (Provisional) 1975-76	Proposed Budget Estimates for 1976-77
	(1)	(2)	(3)	(4)
		(Rupees in lakhs)		
D. GRANTS TO CONSTITUENT/ AFFILIATED COLLEGES				
1. Three lakhs scheme (continuing from Fourth Plan).	204.45	138.80	99,03,333.53	101.50
2. Development Schemes of Colleges to be initiated in Fifth Plan	50.00	25.00	-	90.00
3. Development of Post-graduates studies in Science	22.40	32.00	10,55,173.13	20.00
4. Development of Post-graduate studies in Humanities & Social Sciences	11.30	29.45	10,11,037.80	20.00
5. Development of Colleges in Metropolitan cities				
a) Grants to constitent/ affiliated colleges of Delhi University for specific purposes	52.20	50.00	32,84,160.45	40.00
b) Maintenance Grants to newly established Colleges	-	-	-	-

	Budget Estimates 1975-76	Revised Estimates 1975-76	Actual Expenditure (Provisional) 1975-76	Proposed Budget Estimates for 1976-77
	(1)	(2)	(3)	(4)
6. Grants to teacher training colleges	20.00	24.40	2,26,172.64	15.00
7. Development of Autonomous colleges	15.00	1.50	-	10.00
8. Students' Welfare Programme				
a) Student Aid Fund	35.45	30.10	23,47,096.14	20.00
b) Centeens including NRSC				30.00
c) Water Coolers	0.05	0.05	1,694.58	-
d) Welfare Programme in Colleges	4.15	2.80	1,22,133.12	1.00
e) Health Centres	2.25	0.55	1,06,509.73	10.00
f) Book Banks	46.00	83.70	96,35,356.81	100.00
g) Employment information career advising and vocational guidance	0.30	0.25	1,000.00	1.00
9. Centanary Grants	1.95	4.50	44,750.00	2.00
10. Revision of Salary scales	0.75	0.50	-	0.50
11. Misc. Schemes	0.70	1.05	15,395.71	1.00
Total D	466.95	424.65	2,77,53,813.64	462.00

	Budget Estimates 1975-76	Revised Estimates 1975-76	Actual Expenditure (Provisional) 1975-76	Proposed Budget Estimates for 1976-77
	(1)	(2)	(3)	(4)
			(Rupees in Lakhs)	
GRANTS TO CENTRAL AND STATE UNIVERSITIES FOR OTHER SCHEMES:				
Grants to Jawaharlal Nehru University	159.80	200.00	1,90,27,936.37	250.00
Grants to North-Eastern Hill University	70.00	70.00	70,00,000.00	200.00
Grants to Delhi University (for development of South Delhi Campus)	--	--	45,30,240.00	30.00
Vacant	--	--	--	--
Grants to New Central University (Hyderabad)	75.00	75.00	1,10,70,000.00	200.00
University P.G. Centres	56.35	43.55	46,00,640.00	50.00
College Science Improvement Programme	120.00	120.00	84,45,990.53	100.00
College Humanities Improvement Programme	15.00	10.00	8,37,693.68	50.00
Faculty Awards.				
a) National Fellowships	3.50	3.50	2,40,947.03	3.00

	Budget Estimates 1975-76	Revised Estimates 1975-76	Actual Expenditure (Provisional) 1975-76	Proposed Budget Estimates for 1976-77
	(1)	(2)	(3)	(4)
		(Rupees in Lakhs)		
b) National Lectures	Budget provision under F-VIII			
c) National Associates	2.00	3.00	73,056.77	2.00
d) Sabbatical Leave	0.60	1.00	39,400.00	1.00
e) Visiting Professorships	0.30	2.30	-	2.00
f) Utilisation of services of retired teachers	14.00	16.00	17,73,672.05	20.00
g) Research Associateships	7.50	4.50	1,11,039.19	10.00
10. Faculty Improvement Programme				
a(i) Summer Institutes	89.00	25.00	5,96,052.17	25.00
a (ii) Teacher Fellowship				70.00
b) Seminars, Orientation courses and conferences	15.00	20.00	16,02,566.80	40.00
c) Training Programme for Laboratory and Workshop technicians	-	-	-	5.00
d) New Programmes	-	-	-	-
11. Examination Reforms and Restructuring of courses	9.45	12.50	2,19,458.57	20.00
12. Correspondence Courses	16.00	16.00	12,71,739.12	15.00
13. Unassigned grants	24.15	24.60	20,85,101.54	25.00

p.t.o.

	Budget Estimates 1975-76 (1)	Revised Estimates 1975-76 (2)	Actual Expenditure (Provisional) 1975-76 (3)	Proposed Budget Estimates for 1976-77 (4)
		(Rupees in lakhs)		
Publication of research work (including doctorate thesis)	8.75	6.15	2,82,355.33	5.00
Adult Education and Continuing Education	5.50	8.50	3,69,993.77	10.00
Construction of library buildings	20.60	20.05	19,19,423.62	25.00
Construction of residential accomodation for teachers				
a) Staff quarters	34.50	40.50	18,69,675.92	25.00
b) Teachers hostels	15.95	16.05	7,85,000.00	15.00
a) Construction of hostels	50.60	60.80	56,85,175.13	60.00
b) Improvement of hostel facilities	0.55	1.00	2,000.00	20.00
Guest House	3.00	4.25	1,80,000.00	5.00
Printing Press	2.40	3.90	3,41,571.94	5.00
Welfare Schemes				
a) Students Aid Fund	12.85	9.15	4,23,154.75	10.00
b) Non-Resident Students Centre	1.90	3.35	31,183.00	5.00
c) Students Study Homes	8.50	8.95	2,58,268.19	5.00
d) Health Centres	9.25	8.75	3,76,085.30	5.00
e) Water Coolers	2.00	0.05	363.00	-
f) Study Centres	16.20	9.90	9,08,252.94	10.00
g) Visiting Studentships	0.15	0.15	2,000.00	0.05

p.t.o.

	Budget Estimates 1975-76	Revised Estimates 1975-76	Actual Expenditure (Provisional) 1975-76	Proposed Budget Estimates for 1976-77
	(1)	(2)	(3)	(4)
		(Rupees in Lakhs)		
h) Employment information - career advising and educational guidance for university students	2.20	0.95	33,838.56	1.00
i) Establishment/Improvement - of Canteen facilities	-	-	-	2.00
22. Scholarships				
a) Arabic & Persian	0.70	0.65	56,800.00	0.65
b) Hill Area[illegible] - Scholarships	3.10	1.90	1,45,188.47	2.00
c) Sanskrit/Pali/Prikrit	0.70	0.70	57,033.87	0.70
23. Cultural & Bilateral Exchange Programme	8.20	9.80	7,29,667.71	10.00
24. Indo-USSR Credit Project	12.00	12.00	4,57,616.39	5.00
25. Medical Colleges (Central Universities)				
a) Aligarh Muslim University				
i) Building	6.20	6.20	1,50,000.00	6.00
ii) Equipment	2.65	2.65	2,500-00	[illegible]
iii) Library	1.60	1.60	6,092.34	[illegible]
iv) Furniture	0.75	0.75	-	-
v) Staff & Maintenance	0.30	0.30	-	3.00
vi) Other schemes	5.85	6.20	2,45,000.00	6.50
b) Banaras Hindu University				
i) Buildings	5.05	5.50	2,07,752.87	3.90
ii) Equipment	7.60	6.60	2,00,000.00	3.20
iii) Library	1.20	1.20	2,48,377.82	1.00
iv) Furniture	-	-	-	-
v) Staff & Maintenance	1.25	1.25	1,00,000.00	7.00
vi) Other schemes	1.40	1.40	1,64,689.37	0.05

p.t.

	(1)	(2)	(3)	(4)
			(Rupees in Lakhs)	
c) Delhi University				
i) Buildings ii) Equipment iii) Library iv) Furniture v) Staff & Maintenance vi) Other schemes	21.50	28.50	11,93,000.00	25.00
26. Hospitals attached to Medical Colleges of Central Universities.				
i) Non-Recurring	72.55	65.10	32,95,562.93	74.70
ii) Recurring	25.90	25.90	-	-
27. Development of Campus (Central Universities)	30.00	15.00	11,80,200.00	20.00
28. Students Amenities (Central Universities)	23.40	20.50	8,10,927.21	20.00
29. Revision of salary scales of non-technical teachers	5.00	3.25	1,81,956.58	2.00
30. Centenary & Jubilee Grants	23.50	20.05	3,41,000.00	10.00
31. Three Year Degree Course	-	0.50	-	-
32. Establishment of Chairs				
i) Establishment of Tagore Chairs	.70	0.20		0.20
ii) Establishment of Guru Gobind Singh Chairs	-	-	30,000.00	0.50
33. Nanak Chairs & Nanak Centenary	-	-	-	-
34. Gandhi Centenary Programmes	0.25	0.25	2,721.91	-
35. Gandhi Bhavan	0.25	0.20	4,950.64	-
36. Collection & Preservation of Manuscripts	0.30	0.10	20,000.00	0.10
37. Appointment of Development Officers	1.40	2,35	24,384.21	3.70
38. Appointment of Trained Coaches	0.25	1.45	1,67,902.07	1.50
39. Common Facilities Programme				
a) Development of Computor facilities	66.50	106.75	1,51,78,118.30	150.00
b) Central Instrumentational facilities	20.00	21.50	13,90,829.00	60.00
c) Science Education Centres	41.00	5.00	-	10.00
40. Travel grant to Research fellows/scholars/college teachers for attending conferences within the country and abroad	1.30	1.30	64,516.53	1.70
41. Miscellaneous	27.45	14.20	10,47,602.18	10.00
Total 'E'	1292.45	1240.20	10,46,98,259.67	1767.45

F. MISCELLANEOUS EXPENDITURE

	1.	2.	3.	4.
I. Summer Institutes	1.00	1.00	2,27,292.81	1.50
II. Cultural and Bilateral Exchange Programme	11.30	13.30	11,85,716.67	12.00
III. Centres of Advanced Study	1.00	1.00	7,365.35	0.80
IV. TA & DA to non-official members	5.00	8.00	8,04,891.58	6.00
V. Additional Staff ofor implementation of Vth Plan scheme	5.00	1.90	4,434.85	5.00
VI. Publication	5.00	2.00	61,318.04	2.00
VII. Capital expenditure on UGC building.				
a. Purchase of electric/ appliances/air-conditioners etc.	0.25	0.45	12,457.55	0.45
b. Purchase of motor vehicles	0.25	[illegible]	-	-
c. Construction of UGC Annexe.	-	-	-	-
d. Air-conditioning of building	-	-	-	-
VIII. National Lecturers	3.00	1.80	83,671.75	2.30
IX. Status report on various disciplines etc.	0.25	1.00	10,720.16	1.00
TOTAL 'F'	32.05	30.45	23,97,868.76	31.30

Appendix II

SUMMARY

Annual Plan for 1976-77

S.No.	Name of the Scheme	Fifth Plan outlay in crores	Actual expenditure for 1974-75	Actual expenditure for 1975-76 (provisional)	Total of the expenditure for 1974-75 & 1975-76	Proposed budget estimates 1976-77 (in lakhs)	Total of 1974-75 & 1975 expenditure ar proposed budge estimates 197
1	2	3	4	5	6	7	8
Section A							
1.	Development of Universities - General Development programmes of universities of all faculties other than Engineering and Technology, Agriculture and Medicine.	95.00	10,72,88,593.66	12,17,91,527.22	22,90,80,120.88	1498.05	37,88,85,120.88
2.	Development of Colleges.	45.00	3,81,16,771.66	2,77,53,813.64	6,58,70,585.30	452.00	11,10,70,585.30
3.	Development of Special Programmes and Research.	70.00	5,64,28,652.59	8,77,46,587.59	14,41,75,240.18	1284.35	27,26,10,240.18
	Total Section A	210.00	20,18,34,017.91	23,72,91,928.45	43,91,25,946.36	3234.40	76,25,65,946.36
Section B							
4.	General Development of Universities. Development Programmes of Engg. & Tech., faculties including development programmes of Indian Institute of Science, Bangalore and Indian School of Mines, Dhanbad.	Plan outlay yet to be indicated.	3,95,87,039.40	4,17,42,525.46	8,13,29,564.86	616.10	14,29,39,564.86
5.	Development of medical colleges of Central Universities and Hospitals attached to them,	-do-	98,59,726.13	58,12,975.33	1,56,72,701.46	133.35	2,90,07,701.46
	Total Section B.	-	4,94,46,765.53	4,75,55,500.79	9,70,02,266.32	749.45	17,19,47,266.32
	Grand Total Section A & B.	210.00	25,12,80,783.44	28,48,47,429.24	53,61,28,212.68	3983.85	93,45,13,212.68

S. No.	Name of the Scheme	Fifth Plan Outlay (Rs. in crores)	Actual Expenditure for 1974-75	Actual Expenditure for 1975-76 (Provisional)	Total of the Expenditure for 1974-75 and 1975-76	Proposed Budget Estimates 1976-77 (In lakhs)	Total of 1974-75, 1975-76 Expenditure and proposed Budget Estimat 1976-77.
1	2	3	4	5	6	7	8
1.	Development of Universities - General Development Programmes of Universities of all faculties other than Engineering & Technology, Agriculture and Medicines as under:						
	(a) Staff (Teaching & Technical)		1,42,58,130.35	31,83,935-27	1,74,42,065-62	130.00	3,04,42,065-62
	(b) Scientific equipment.	82.00	1,90,11,238-40	2,68,25,991-23	4,58,37,229-63	110.00	5,68,37,229-63
	(c) Academic buildings		1,23,76,810-33	88,17,760-08	2,11,94,570-41	125.00	3,36,94,570-41
	(d) Library facilities (Books & Journals)		1,37,81,900-57	1,98,42,809-17	3,36,24,709-74	145.00	4,81,24,709-74
	(e) General facilities for Universities like Hostels, staff-qrts., guest house, workshop facilities, printing presses etc.		1,45,77,729-77	1,07,82,846-61	2,53,60,576-38	155.00	4,08,60,576-38
	(f) Student Welfare Programmes	1.00	41,15,911-92	28,44,066-95	69,59,978-87	58.05	1,27,64,978-87
	(g) Unassigned grants	1.00	15,41,994-36	20,85,101-54	36,27,095-90	25.00	61,27,095-90
	(h) Campus development of Central Universities	1.00	17,66,471-43	57,10,440-00	74,76,911-43	50.00	1,24,76,911-43
	(i) New Universities and University Centres for Postgraduate Studies.	10.00	2,30,03,841.85) 28,54,564.68)	3,70,97,936-37) 46,00,640-00)	6,01,01,778-22) 74,55,204-68)	650.00) 50.00)	12,51,01,778-22) 1,24,55,204-68)
	TOTAL :	95.00	10,72,88,593-66	12,17,91,527-22	22,90,80,120-88	1498.05	37,88,85,120-88

1	2	3	4	5	6	7	8
II	Development of Colleges						
(a)	Development of Under-graduate education except Metropolitan cities.	20.00	2,25,85,676.35	99,63,479.24	3,25,49,155.59	195.00	5,20,49,155.59
(b)	Development of Colleges in Metropolitan cities - Bombay Calcutta, Delhi and Madras.	6.00	38,97,980.51	32,84,160.45	71,82,140.96	40.00	1,11,82,140.96
(c)	Development of Post-graduate Colleges.	10.00	18,89,066.44	20,66,210.93	39,55,277.37	40.00	79,55,277.37
(d)	Student Welfare Programmes in Colleges - Students aid-Fund, Book Banks	8.00	84,07,292.94	1,22;13,790.38	2,06,21,083.32	162.00	3,68,21,083.32
(e)	Teachers Education in Training Colleges	1.00	13,36,755.42	2,26,172.64	15,62,928.06	15.00	30,62,928.06
	Total	45.00	3,81,16,771.66	2,77,53,813.64	6,58,70,585.30	452.00	11,10,70,585.30

1	2	3	4	5	6	7	8
III	Support for Research.						
	(a) Research Grant (Science Research and Humanities Research Council, Science and Humanities panels)	29.00	1,36,99,108.24	2,31,77,437.21	3,68,76,545.45	350.00	7,18,76,545.45
	(b) Centres of Advanced Studies and Deptt. of special assistance.						
	(c) COSIP, COHIP and Antonomous Colleges	10.00	82,62,195.51	92,83,684.21	1,75,45,879.72	160.00	3,35,45,379.72
	(d) Research Fellowships	7.5	1,96,72,332.71	2,59,69,070.21	4,56,41,402.92	245.00	7,01,41,402.92
	(e) Faculty Improvement Scheme	2.5	30,14,015.18	21,98,618.97	52,12,634.15	140.00	1,92,12,634.15
	(f) Faculty Awards	2.0	10,88,761.15	22,38,115.04	33,26,876.19	38.00	
	(g) Computer Faculties.	5.0	10,08,000.00	1,51,78,118.30	1,61,86,118.30	150.00	3,11,86,118.30
	(h) Regional Instrumentation faculities	2.0	-	13,90,829.00	13,90,829.00	60.00	73,90,829.00
	(i) Regional Library Centres	2.0	-	-	-	-	-
	(j) Restructuring of courses science Education centres and examination Reforms.	4.0	59,103.67	2,19,458.57	2,78,562.24	30.00	32,78,562.24
	(k) Correspondence cources	1.0	2,89,400.00	12,71,739.12	15,61,139.12	15.00	30,61,139.12
	(l) New programmes to be initiated on the advice of panels/S.R.S./ other studying centres.	1.0	-	-	-	-	-
	(m) Needs arising out of International collaboration scheme	3.0	93,35,736.13	68,19,516.96	1,61,55,253.09	96.35	2,57,90,253.09
	(n) Miscellaneous Progr	1.0					
	Total		5,64,28,652.59	8,77,46,587.59	14,41,75,240.18	1284.35	27,26,10,240.18

1	2	3	4	5	6	7	8
IV	General development of Universities Development Programme of Engineering and Technology facilities including development programmes of Indian Institute of Science Bangalore and Indian School of Mines, Dhanbad.						
	(a) Staff and Maintenance	Plan outlay	47,83,652.24				
	(b) Construction of Buildings	yet to be	37,67,427.50				
	(c) Purchase of equipments	determined.	99,18,823.34	3,17,75,704.80	5,87,42,648.26	384.00	9,71,42,648.26
	(d) Library books & Journals		18,47,634.62				
	(e) Miscellaneous schemes		25,464.50				
	(f) Junior Fellowships		66,23,941.26				
	(g) Research Fellowships		2,63,690.14	5,15,541.53	7,79,231.67	5.00	12,79,231.67
	(h) Construction of Hostels		3,04,135.42	85,844.00	3,89,979.42	0.80	4,69,979.42
	(i) Constriction of Staff quarters		nil	5,000.00	5,000.00	0.10	15,000.00
	(j) Revision of Salary Scales.		5,044.00	-	5,044.00	0.10	15,044.00
	(k) Grants to Indian Institute of Sciences, Bangalore		1,11,76,524.83	80,89,435.13	1,92,65,959.96	100.00	2,92,65,959.96
	(l) Grants to Indian School		8,70,701.55	12,71,000.00	21,41,701.55	116.10	1,37,51,701.55
	(m) Support for Research		-	-	-	10.00	10,00,000.00
	Total	-	3,95,87,039.49	4,17,42,525.46	8,13,29,564.86	616.10	14,29,39,564.86

1	2	3	4	5	6	7	8
V	Development of Medical Colleges of Central Universities and Hospitals attached to them.	Plan outlay yet to be determined.					
	(i) Aligarh Muslim University, Banaras Hindu University & Delhi University.						
	(a) Building (b) Equipment (c) Library (d) Furniture (e) Staff & Maintenance		33,54,432.35	25,17,412.40	58,71,844.75	58.65	1,17,36,844.75
	(ii) Hospitals attached to Medical Colleges of Central Universities (Non-Recurring & Recurring)		65,05,293.78	32,95,562.93	98,00,856.71	74.70	1,72,70,856.71
	Total:		98,59,726.13	58,12,975.33	156,72,701.46	133.35	2,90,07,701.46

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UNIVERSITY GRANTS COMMISSION

Meeting:

Dated : 29th April, 1976.

Item No.31. To consider the proposal of the Bombay University for the continuation of the Sabbatical Leave Programme in respect of teachers in Physics from the constitutent colleges of the University.

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The Commission approved of a proposal in March 1971 from the Bombay University for providing assistance to teachers to pursue higher studies/research at TIFR Bombay on sabbatical leave. Under the programme, the Commission is required to provide financial assistance to the Bombay University to to cover the salary including allowances in respect of upto six teachers annually in Physics from the Colleges for pursuing higher studies/research at the TIFR Bombay for a period of one year subject to the condition that the selected teachers are granted study leave by their respective college authorities. During the period 1971-72 to 1974-75, the Commission has made available an amount of Rs.2,30,032.35 to cover the expenses incurred on the teachers on their salary including allowances for the period of their higher studies/training at the TIFR Bombay.

The Bombay University was informed that the sabbatical leave programme should be implemented under the University Grants Commission programme of Faculty Improvement (Teacher Fellowship) recently introduced by the Commission. The University has intimated that there is a basic difference between the sabbatical leave programme and the University Grants Commission programme of Faculty Improvement (Teacher Fellowship). In the case of the former, the Commission has agreed to provide salary with all allowances in respect of upto six teachers in Physics from Colleges for one year's training at TIFR whereas the Faculty Improvement programme envisages that the college concerned would continue to pay the salary and allowances in respect of teachers selected for higher studies/research on short or on long-term basis for raising their professional competence and academic attainments. The Commission is required to provide salary of the substitute who may be appointed by the college concerned for the duration of the training of the selected teachers under the Teacher Fellowship. The Commission is also required to provide a contingent grant of Rs. 1,000/- per annum to the university/the institute where the teacher fellow may undertake his research under the programme. The teacher fellow is also entitled to receive a living allowance of Rs. 250/- p.m. from the Commission for the duration of his training if he happens to work at a university/institute away from his normal place of duty- It may be stated that the sabbatical leave programme of the Bombay University covers only teachers in Physics and that too with a total number not exceeding six each year. The teacher fellowship

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under the Faculty Improvement Programme covers all the disciplines and the number of teachers to be benefited under the programme is expected to large as no limit has yet been fixed.

In view of this basic difference between the two programmes, the Bombay University has requested that its sabbatical leave programme for Physics teachers may continue for one more year when the University will be in a position to formulate its mechanics for implementation of the teacher fellowship programme under Faculty Improvement. In view of above, the Commission has agreed to provide an amount of Rs. 62,043/- towards the implementation of the sabbatical programme in respect of six teachers in Physics from the constituent colleges of Bombay University during 1975-76

It is for consideration if the sabbatical leave programme of the Bombay University pertaining to six teachers in Physics annually may be continued.

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UNIVERSITY GRANTS COMMISSION

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Meeting:
Dated : 29th April, 1976.
Venue : UGC Office, New Delhi.

Item:32. To consider the question of extension of the two Senior Fellowship of the value of Rs. 1,000/- each offered by U.G.C. to Afghan Scholars by one year.

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The University Grants Commission at its meeting held on 2nd February, 1972 on the suggestion of the Government of India, Ministry of Education & Social Welfare agreed to institute two Senior Fellowships of the value of Rs. 1,000/- per month each for two years for two teachers from Afghanistan (Item 57) Shri W.S. Taniwal and Dr. S.K. Dadgar were sponsored by the Government of Afghanistan for these scholarships. Shri W.S. Taniwal joined the Jawaharlal Nehru University (Sociology Deptt.) w.e.f. 22.2.1974. Subsequently the Jawaharlal Nehru University informed the U.G.C. that Shri Taniwal needed to strenthen his base in English language and learn Sanskrit for pursuing his course further and thus he had been advised to join the course in English and Sanskrit. He studied in Jawaharlal Nehru University for one year and then requested for change to Aligarh Muslim University. His appliction was duly recommended by the Head of the Deptt. of Pushto Language, Kabul University. Shri Taniwal was allowed to join M.A. Linguistics Aligarh Muslim University (Deptt. of Linguistics) w.e.f. August, 1975. The duration of M.A. course in Linguistics is two years at Aligarh Muslim University. He will thus appear in the Final Examination sometime in April/May, 1977, whereas the tenure from 22.7.74 will expire on 21st July, 1976. Shri Taniwal has, therefore requested for extension of the fellowship for another year.

Dr. S.K. Dadgar the other scholar has also requested for extension of his fellowship by one year from August, 1976. He joined the Deptt. of Forsic Medicine, Aligarh Muslim University for doing M.D. course. After working in the Deptt. for five months, he is stated to have found that there is no field for M.D. in Forensic Medicine. In consultation with the Dean, Faculty of Medicine, Aligarh Muslim University he joined M.D. in Pathology in August, 1975. The course for M.D. being of two years duration and he will appear for his final examination sometime in August, 1977 whereas his present fellowship ends in July, 1976.

It is for consideration whether the fellowships may be extended for another year in consultation with the Government of Afghanistan.

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UNIVERSITY GRANTS COMMISSION

Meeting :
Dated : 29th April, 1976.

Item: 33 To consider the report of the Visiting Committee appointed to examine the proposal of the Gujarat University, Ahmedabad for the introduction of postgraduate courses in Textile Chemistry etc.

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The UGC appointed a Committee of the following to examine the proposal of the Gujarat University, Ahmedabad for introduction of postgraduate courses in Textile Chemistry, Industrial Analytical Chemistry, Pharmaceutical Chemistry and Polymer Science :

1. Professor E.H. Daruwalla
Department of Chemical Technology
Bombay University,
Bombay.

2. Professor R.C.Kapoor
Department of Chemistry
Jodhpur University
Jodhpur.

3. Professor R.N.Mukherjee
Department of Chemical Technology
Jadavpur University
Jadavpur.

4. Shri S.P. Gupta
Deputy Secretary
University Grants Commission.

The Committee visited the Gujarat University, Ahmedabad on April, 12-13, 1976 and held discussions with the Vice-Chancellor, members of the staff of the Gujarat University, Ahmedabad Textile Industry Research Association (ATIRA), L.M. College of Pharmacy, representatives of the Ahmedabad Mill-owners Association, Gujarat Chambers of Commerce and Industry and Chemical and Pharmaceutical Industries. The report of the Committee is given as Annexure. The main observations and recommendations are given as under :

1. The Committee was happy to note that the University had been able to obtain, from Industrial & Business doners, a donation of Rs.50 lakhs for the starting of the proposed courses at Gujarat University. The Committee welcomed the new trend of cooperation between the industry and the University and also the collaboration which the ATIRA would extend to the Gujarat University in the conduct of the course in Textile Chemistry and in the use of specialist manpower and sophisticated equipment.

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2. The Committee has recommended starting of a 2-year M.Sc. course in Textile Chemistry under a new department of Textile Chemistry. It has recommended that the donation of Rs.30 lakhs secured by the Gujarat University for Textile Chemistry should be utilised for building and equipment and the assistance towards the following staff may be provided by the UGC -

Professor-1
Readers -2
Lecturers-3

3. The Committee has recommended starting of two-year M.Sc. programme in Analytical Chemistry under the existing department of Chemistry. The first year of the new course would be common with the M.Sc. (Prev.) of Organic/Inorganic/Physical Chemistry. The second year of the course would be devoted to specialisation in Analytical Chemistry. The Committee has recommended that the donation of Rs.5 lakhs secured by the Gujarat University should be utilised for equipment, and assistance towards the following staff may be provided by the UGC.

Professor-1
Reader -2
Lecturers-2

4. The Committee has recommended that starting of a separate M.Sc. course in Pharmaceutical Chemistry would not be of much use to the industry since the course would neither meet the requirements of the Pharmaceutical insustry for Pharmacist (who are eligible to become Registered Pharmacist) nor for synthesis and drug design for which a background in Organic Chemistry is necessary. However, there is a need for Analytical Chemists for Pharmaceutical & related industires. By admitting students in the M.Sc. course in Analytical Chemistry and giving some stress on Pharmaceutical Chemistry it would be possible to make it relevant to the Pharmaceutical industry also. The Committee has recommended one post of Reader for this purpose under Analytical Chemistry. The donation of Rs.5 lakhs secured by the Gujarat University should be used for obtaining sophisticated equipment in the field of Pharmaceutical Chemistry.

5. The Committee has recommended that the Gujarat University may start a Department of Polymer Science and conduct a two-year M.Sc. course in Polymer Science. The course will be science-based and technology-oriented in order to provide trained manpower for the Plastic conversion industry for transferring the secondary products of the petro-chemical industry into tertiary products for consumer use. In this respect it will be different from the M.Sc. (Polymer Chemistry) course at the Sardar Patel University, Vallabh Vidyanagar. The Committee has recommended that the donation of Rs.10 lakhs secured by the Gujarat University should be utilised for building and

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equipment and assistance for the following staff may be provided by the UGC:

Professor-1
Readers -2
Lecturers-3

In all, the Committee has recommended the posts of 3 Professors, 6 Readers and 8 Lecturers for all the courses mentioned above. The expenditure on the staff during the Fifth Five Year Plan is estimated to be Rs.6.74 lakhs. The Fifth Plan Visiting Committee has made a provision of Rs.8 lakhs for Textile Chemistry and Analytical Chemistry in Second Priority.

The matter is placed before the Commission for consideration.

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Annexure to Item No. 33

(159)

Report of the Visiting Committee to examine the proposals of the Gujarat University for starting postgraduate courses in Textile Chemistry, etc.

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The University Grants Commission appointed a Committee consisting of the following to examine the proposals of the Gujarat University, Ahmedabad for starting postgraduate courses in Textile Chemistry, Industrial Analytical Chemistry, Pharmaceutical Chemistry and Polymer Sceince :

1. Professor E.H.Daruwalla
   Department of Chemical Technology
   Bombay University
   Bombay

2. Professor R.C.Kapoor
   Department of Chemistry
   Jodhpur University
   Jodhpur.

3. Professor R.N.Mukherjee
   Department of Chemical Technology
   Jadavpur University
   Calcutta.

4. Shri S.P.Gupta
   Deputy Secretary
   University Grants Commission.

The Committee visited the Gujarat University, Ahmedabad on 12th & 13th April, 1976 and held discussions with the Vice-Chancellor, members of the staff, representatives of the Ahmedabad Mill Owners Association, Gujarat Chambers of Commerce & Industry, Chemical and Pharmecautical Industries and Ahmedabad Textile Industries Research Association (ATIRA). The Committee also visited the Chemistry Department of the Gujarat University and ATIRA and saw the facilities available there.

Proposals of the University

The Gujarat University intimated that the approach of the University during Fifth Plan is (i) Consolidation and (ii) Fulfilment of social needs Accordingly, the Vice-Chancellor of the University held discussions with Business, Industry and Commerce groups in different sectors and finalised new areas in consultation with them with a view to meeting the manpower and research needs of the community in order to secure their involvement. They were requested to share the non-recurring expenditure by way of donations. Thus the University secured

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donations for new departments as under :

(i)	Textile Chemistry ..	Rs.30 lakhs
(ii)	Industrial Analytical Chemistry ..	Rs. 5 lakhs
(iii)	Pharmaceutical Chemistry ..	Rs. 5 lakhs
(iv)	Polymer Science ..	Rs.10 Lakhs

While this financial cooperation of the community was secured the University also took into account the needs of consolidation. The postgraduate department of Chemistry of Gujarat University admits 140 students every year for organic, inorganic and physical branches. Besides, the University has postgraduate centres in Chemistry at several places. The M.Sc. in such a large number naturally do not get employment. Hence the University thought of diversification in the following areas which interalia would meet the training and research needs of industires.

(i) Textile Chemistry
(ii) Industrial and Analytical Chemistry
(iii) Pharmaceutical Chemistry
(iv) Polymer Science

Recommendations of the Fifth Plan Visiting Committee

The Fifth Plan Visiting Committee which visited the Gujarat University on 30th January & 1st February, 1975 had considered the proposals of the University to start new courses in Textile Chemistry etc. The Committee noted that substantial grants had been promised by local industiralists for this purpose. Taking into account the rapid industrialisation around Ahmedabad and manpower needs that are likely to arise in these areas and also taking into account the commendable interest shown by local industries in giving some capital grants to launch these courses, the Committee recommended:

a) that the courses of Textile Chemistry and Industrial Analytical Chemistry could be started in second priority. (The Committee found it difficult to include these in first priority, because of the pressing demands for consolidation of existing programmes). However, the University may submit a more detailed proposal to UGC and make adequate preparations before starting these courses.

b) that there does not appear to be a strong case for starting a course in Pharmaceutical Chemistry in view of the existence of a College of Pharmacy at Ahmedabad, close to the University.

c) that the University may not start a PG course in Polymer Science at Nadiad, in view of the fact that there exists

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a good programme in Polymer Chemistry at S.Patel University, which is not too far away. It would be more desirable if funds from private donors are available, to strengthen and diversify the progr mme in Polymer Science at Sardar Patel University.

Observations & Recommendations

The Committee was happy to note that the industry and business have given a donation of Rs. 50 lakhs for starting the proposed courses at Gujarat University. The Committee welcomed the new trend of cooperation between the industry and the University and also the collaboration which to ATIRA is extending to the University in the conduct of the course and research in Textile Chemistry and in the use of specialist manpower and sophisticated equipment. The Committee went into the details of the different courses proposed by the University and held detailed discussions with the members of the staff of the Chemistry Department, Gujarat University. Dr.P.C. Mehta of the ATIRA and Dr.C.S.Shah of the L.M.College of Pharmacy also took part in the discussions.

1. Textile Chemistry

Ahmedabad is prominent textile centre of Gujarat and Gujarat represents a fairly high percentage of the textile units in the country. There is no facility in the whole of Gujarat for teaching and research in textile chemistry. The proposed two year M.Sc. course in Textile Chemistry would cover Fibre Science, Manufacture of Yarn & Cloth, Chemistry of Textile Auxilliries, Chemistry of Intermediates and Dyes, Theory of Dyeing, Chemical Processing of Textiles, Heat Engine, Economics and Organic Chemistry. The Committee recommends that the proposed course may be started with an intake of 15 students every year. The students should be admitted on merit on all-India basis. A separate department of Textile Chemistry may be started by the Gujarat University for conducting the course and there should be collaboration with the ATIRA in teaching and research programmes as also in the utilisation of the facilities of pilot plantand equipment available at the ATIRA. The donation of Rs.30 lakhs secured by the Gujarat University should be utilised for building equipment etc. i.e. all the non-recurring expenditure. The Committee recommends the following teaching staff :

Professor-1
Readers -2
Lecturers-3

One of the staff members should have Chemical Engineering or Mechanical/Electrical Engineering background to look after the technical aspects of the course.

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2. Industrial Analytical Chemistry

For industrial development a close liasion between the industry and the University is necessary. At present the experience is that students even with brillient academic career find it difficult to adjust themselves to industry. The Committee supports the proposal of the University to start a two-year course in Analytical Chemistry with an intake of 15 students every year. The Committee, however, feels that it is not necessary to have a separate department for this course. The existing department of Chemistry of the Gujarat University may conduct this course as a part of the M.Sc. programme. The Committee suggests that the M.Sc. (Prev.) course should be common with the Organic/Inorganic/Physical Chemistry branches, and Analytical Chemistry should be introduced in the M.Sc. (Prev.) course for all students, which means that Organic, Inorganic, Physical and Analytical Chemistry would be compulsory for all students in the M.Sc. (Prev.) course in Chemistry. The M.Sc. (final) course should be separate for Analytical Chemistry. This arrangement will lead to some integration of the different branches and avoid duplication of facilities. It would be useful to set up consultancy services in the department for analysisjob. These services would be self-supporting in view of the fact that the industry would pay for the consultancy given by the department.

Since the intake to the M.Sc. course in Chemistry would be adjusted to accommodate the new branch of Industrial Analytical Chemistry much of the existing facilities in the Chemistry department could be utilised for this course. Hence there would be no need for additional accommodation. The donation of Rs. 5 lakhs secured by the University should be utilised for the purchase of equipment. If necessary, some part of the Fifth Plan allocation for the Chemistry Department and Central Instrumentation Lab. may also be utilised for equipment necessary for this course. The Committee recommends that the University Grants Commission may provide assistance towards teaching staff as under :-

Professor- 1
Readers - 2
Lecturers- 2

There should be one Reader in the field of Micro-analysis and 1 Reader in Bio-Pharmaceutical Chemistry.

One of the Lecturers should be an Electronics/Electrical Engineer who will do teaching as well as maintenance work.

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3. Pharmaceutical Chemistry

The need of a multi-facetindustry such as the pharmaceutical industry ranges from R& D to production, quality control and sales. The pharmaceutical industry requires medical graduates, as well as , Chemical Engineers and managers besides Pharmacy and Chemistry graduates. For most of the jobs the industry prefers specialists. Thus for synthesis they prefer a Ph.D. in Organic Chemistry assisted by M.Sc. in that subject. The future trend could be a multi-disciplined approach but the minimum level of Organic Chemistry needed for this job is the equivalent of a two-year M.Sc. course in the subject.

For quality control Pharmacy graduates are in demand, but the course purely devoted to Analytical Chemistry is also finding favour with the industry. Thus students obtaining an M.Sc. degree in Analytical Chemistry are in increasing demand in pharmaceutical industries.

In addition there is a demand for Pharmacists for which there are two avenues. One is the diploma course in Pharmacy conducted as per rules laid down by the Pharmacy Council of India, the other is the B.Pharm degree. Hence the needs of the industry under this head can only be met by increasing admissions to either of the above named courses. A different industry oriented approach is to be seen in the Bombay University B.Sc. Tech. (Pharmaceutical and Fine Chemicals) course of three years duration after B.Sc. which provides training in Pharmaceutical Sciences as well as in Engineering/Technology.

The Committee feels that the proposed course in Pharmaceutical Chemistry cannot meet the demands of the industry. There is, of course some employment potential for Analytical Chemists in the Pharmaceutical and related industries and for this end the students doing two-year M.Sc. course in Analytical Chemistry are likely to get preference in employment. Similarly the proposed course in Pharmaceutical Chemistry may not meet the demand for research personnel for synthesis and drug design, for which the background organic chemistry training has to be far more intensive than possible in the envisaged course. In addition, the details of the proposed course are such that the possibility of producing technologists who can attend to the manufacture of basic drugs and pharmaceutical preparations are little.

Taking into consideration all these points, the Committee feels that there should be no separate course in Pharmaceutical Chemistry. However, the Committee suggests that the M.Sc. course in Analytical Chemistry should be strengthened so as to make it relevant to Pharmaceutical industry also. The Committee has already recommended the post of 1 Reader for this purpose under the M.Sc. course in Analytical Chemistry. The donation of Rs. 5 lakhs secured by the University should be used for adding sophisticated equipment for Pharmaceutical Chemistry.

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4. Polymer Science

With the establishment of the Petro-chemical complexes in Gujarat training and teaching in Polymer Science ass-umes a new importance. The development of the Rubber and By-products industry adds to the need for study and research in Polymer. The Gujarat University proposes to set up a department to provide trained manpower in Polymers as also to conduct research in the field. Industrialists have donated a sum of Rs. 10 lakhs for the establishment of this department.

It is expected that the Plastic conversion industry for transforming the secondary products of the petro-chemical industry into tertiary products for consumer use will also grow very rapidly. This growth could be predominantly in the small and medium industry sector. In fact such a structure has been envisaged in Gujarat where the industrial estate at Nandisari near the IPCL complex, Koyali, is expected to have a concentration of sueh conversion units, The proposed M.Sc. (Polymer Science) course has been designed with those needs in view. The teaching time is almostt equally divided between the Chemistry and Technology aspect. Even ffor engineering application, a theoretical understanding of the structure and properties of Polymers and efficient methods of Polymerization will be useful. An elementary acquintance with the manufacture of different kinds of Polymers has also been included.

It is understood that the course in M. Sc. Polymer Chemistry which is offered at the Sardar Patel University, Vallabh Vidyanagar is predominantly, if not exclusively, Chemistry based. On the other hand the proposed course at Gujarat University is science based and technology-oriented. The Committee feels that there is an equal need for this type of training in relation to the anticipated industrialisation in Gujarat and other States within the next few years and recommends starting of a 2- year M. Sc. course under a new department.

The Committee recommends that the donation of Rs. 10 lakhs received by the University should be utilised for building and equipment. Assistance towards the appointment of following staff may be provided by the University Grants Commission.

Professor	- 1
Readers	- 2
Lecturers	- 3

The Committee also recommends that in view of the applied orientation of the course, 50% of the staff should be having engineering/ technology background.

The Committee thanks the Vice-Chancellor, Members of the staff of the Gujarat University, ATIRA and the industrialists of Ahmedabad for their cooperation and help towards the completion of the work.

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